

***Town
of
View
Royal***

***Transportation
Master
Plan***

March 2008



BUNT
ASSOCIATES



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- ◆ Capital Regional District
- ◆ City of Colwood
- ◆ City of Langford
- ◆ City of Victoria
- ◆ Department of National Defense
- ◆ District of Saanich
- ◆ Esquimalt Nation
- ◆ Insurance Corporation of British Columbia
- ◆ Ministry of Transportation
- ◆ Songhees Nation
- ◆ Township of Esquimalt
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- ◆ Town of View Royal staff
- ◆ Town of View Royal Transportation Advisory Committee
- ◆ Westshore RCMP

Bunt & Associates also wishes to acknowledge the contributions of the other members of the Project Team.



glossary of terminology

ACT	Association for Commuter Transportation of Canada
CEAA	Canadian Environmental Assessment Agency
CIPP	Cycling Infrastructure Partnerships Program
DND	Department of National Defense
EAO	Environmental Assessment Office
EB	Eastbound
GSPF	General Strategic Priorities Fund
GVRD	Greater Vancouver Regional District
IF	Innovations Fund
IH	Island Highway
LOS	Level of Service
LPA	Local Planning Area
MoT	Ministry of Transportation
MoE	Ministry of Environment
MRIF	Municipal Rural Infrastructure Fund
MUTCDC	Manual of Uniform Traffic Control Devices of Canada
NB	Northbound
OCP	Official Community Plan
SB	Southbound
TAC	Transportation Association of Canada
TC	Transport Canada
TCH	Trans Canada Highway
TDM	Transportation Demand Management
TMP	Transportation Master Plan
TSM	Transportation Supply Management
UBCM	Union of British Columbia Municipalities
VPD	Vehicles per day
VPH	Vehicles per hour
WB	Westbound

relevant internet sites

Association for Commuter Transportation of Canada
<http://www.actcanada.com/EN/default.aspx>

British Columbia Ministry of Environment
<http://www.gov.bc.ca/env/index.html>

British Columbia Ministry of Tourism, Sport and Arts
<http://www.tsa.gov.bc.ca/archaeology/>

British Columbia Ministry of Transportation
<http://www.gov.bc.ca/tran/>

Canada-British Columbia Municipal Rural
Infrastructure Fund
<http://www.canadabcmrif.ca>

Canadian Environmental Assessment Agency
<http://ceaa-acee.gc.ca>

Capital Regional District
[http://www.crd.bc.ca/transportation/rtdms/
TrafficCounts.aspx](http://www.crd.bc.ca/transportation/rtdms/TrafficCounts.aspx)

CivicInfo BC
<http://www.civicinfo.bc.ca>

Commissioner of the Environment and Sustainable
Development
<http://www.oag-bvg.gc.ca>

Cycling Infrastructure Partnerships Program
[http://www.th.gov.bc.ca/populat-topics/cycling/cipp.
htm](http://www.th.gov.bc.ca/populat-topics/cycling/cipp.htm)

Environmental Assessment Office
<http://eao.gov.bc.ca>

External Advisory Committee on Cities and
Communities
[http://www.infrastructure.gc.ca/eaccc-ccevc/index_
e.shtml](http://www.infrastructure.gc.ca/eaccc-ccevc/index_e.shtml)

Infrastructure Canada
http://www.infrastructure.gc.ca/index_e.shtml

Insurance Corporation of British Columbia
[http://www.icbc.com/road_safety/roadsafety_
support.asp](http://www.icbc.com/road_safety/roadsafety_support.asp)

LocalMotion
<http://www.localmotion.gov.bc.ca>

Ministry of Transportation
<http://www.th.gov.bc.ca/trafficData/>

Smart Growth BC
<http://www.smartgrowth.bc.ca/>

Town of View Royal
[http://Town.viewroyal.bc.ca/documents/index.
php?SUID=&selectedFolder=111](http://Town.viewroyal.bc.ca/documents/index.php?SUID=&selectedFolder=111)

Transport Canada
<http://www.tc.gc.ca/en/menu.htm>

Transport Canada: Urban Transportation Showcase
Program
[http://www.tc.gc.ca/programs/environment/UTSP/
menu.htm](http://www.tc.gc.ca/programs/environment/UTSP/menu.htm)

Transportation Association of Canada
<http://www.tac-atc.ca/>

Union of British Columbia Municipalities
<http://www.civicnet.bc.ca>



executive summary

1.1 introduction

Bunt & Associates Engineering Ltd was retained by the Town of View Royal to prepare a Transportation Master Plan for the community in 2006. The Town's vision for the community and its transportation network is provided in their current Official Community Plan as:

"a quiet traditional "small town" residential community with a modest rate of growth. It is made up of sustainable neighbourhoods that are desirable places to live – convenient, walkable, attractive, affordable and safe. These neighbourhoods will be self-sufficient in many respects and be connected to one another through greenspace corridors and pedestrian/cyclist-friendly streets. The impact of major transportation corridors that pass through View Royal will be minimized,"

The thrust of this plan is to provide additional capacity for alternative modes of transportation while making the existing road infrastructure work more effectively, but not at the expense of providing capacity for alternative modes of transportation. Rather, the Town has been consistently striving for a transportation network that reflects the desire of residents and businesses for increased travel choices. They see their roads as community resources for the benefit of all users and want to see additional infrastructure built to accommodate pedestrians as well as bicycle and transit users.

1.2 context

As outlined in the Request for Proposals, it was a requirement that the strategies used in the development of this transportation plan conform to the Transport Canada "Strategies for Sustainable Transportation Planning: Summary of Principles and Options". It is encouraging that there is significant consistency in the strategic direction of senior levels of government on this and related issues, albeit not necessarily in their priorities and funding for their respective initiatives. Transport Canada also recommends a more comprehensive approach which can include a variety of tools or approaches. These include transportation demand management, transportation supply management, consideration of all transportation modes plus the integration of land use and transportation planning while incorporating the values and objectives of the community.

The approach described in the Transportation Master Plan is also consistent with the Regional Growth Strategy adopted by the Capital Regional District which supports a region-wide approach of focusing on alternative modes of transportation as one way of addressing the forecasted significant growth in the demand for travel by its residents.

1.3 approach

One of the overarching objectives of this project was to be proactive in soliciting and incorporating input from the Town of View Royal, their neighbours and stakeholders with an interest in the community. This was accomplished with an initial Open House for all the residents and businesses of the community as well as a series of meetings involving other impacted parties. These included Federal, First Nations, Provincial, Regional and Municipal levels of government, Crown corporations, special interest groups and emergency service providers.

Input from this cross-section of participants reinforced the vision and desire of the community to see their roads as community resources for the benefit of all users, not just vehicular traffic. This emphasis on pedestrian traffic, sidewalks, paths and trails, cycling, public transit and traffic calming are reflected in this study's approach.

At the same time, the current level of development within the Town was compiled and the potential levels of development as contained in the Land Use Zoning Bylaw and the Official Community Plan were assessed to determine the impact of full build out through redevelopment as it could occur over the next twenty years. The results of this step were input into the micro-simulation software Synchro/SimTraffic to determine the impact of the different growth scenarios on the operational effectiveness of the road network within the Town. This analysis identified areas of potential mitigation measures for the road network which were combined with recommended improvements for bicycle lanes and sidewalks into a series of projects. These projects were then prioritized by a Working Sub-Committee of the Town of View Royal's Transportation Advisory Committee. After a presentation of these results to the Committee of the Whole, another Open House and series of meetings with the same stakeholder groups consulted at the start of the project were held to solicit more input and feedback. A revised draft of the Transportation Master Plan was subsequently prepared to present to the Committee of the Whole, finalized, and submitted to the Town of View Royal.

During the conduct of this project, Bunt & Associates was also retained to work on other more operationally oriented projects for the Town which provided a deeper and more comprehensive knowledge of the Town's transportation networks. These opportunities contributed positively to the breadth and depth of the analysis presented in the following sections describing the Town of View Royal's Transportation Master Plan.

A project dealing with the sidewalk, trail and path networks in the Town was also conducted in conjunction with the Transportation Master Plan. The condition of the existing infrastructure was documented and the gaps identified and prioritized. The results are documented in a separate report entitled Pedestrian Plan and Sidewalk Condition Inventory.

1.4 results and recommendations

Under the present operational conditions, full build out as envisioned in the Official Community Plan and the Town's zoning bylaw will result in continued degradation of the level of services for the road system even with the recommended improvements. Congestion, queuing and the associated byproducts of road-related travel will continue to increase to unacceptable levels. This is why the sustainable transportation planning principles espoused by Transport Canada, amongst a host of others, becomes critical. If we are not prepared to manage the transportation systems and try to change current trip making behaviours, the peak hour will continue to become the peak hours, pollutants will continue to increase affecting climate change and our physical health, and health care systems will be put under increased stress.

The recommendations in this report cover a broad spectrum from project implementation to strategic direction to technical warrants. The recommended improvements are summarized in Chapter 6 and detailed in Appendices H and J. and the technical documents in a series of Working Papers. The strategic directions and modal specific approaches are highlighted here.

The following activities are recommended in order to assist the Town of View Royal with achieving its vision as stated in the current OCP:

- ◇ Adoption of this plan, strategies and recommended projects as a guiding document for sustainable transportation planning which will be reviewed in conjunction with the ongoing update to the Official Community Plan;
- ◇ Continue to foster relationships with neighbouring agencies to achieve mutual consensus on future direction with respect to infrastructure consistency;
- ◇ Develop land-use bylaws that encourage mixed use, transit oriented development;
- ◇ Acquire right-of-way along road corridors as development occurs to provide opportunities for wider rights-of-way. This is not to add additional lanes for vehicular traffic but to accommodate more sustainable options such as priority transit, HOV or intermediate and high capacity commuter options;
- ◇ Continue the development of an integrated network of alternative mode facilities;
- ◇ Work with major employers to promote TDM strategies and incentives. Some of these employers may not be located within the Town, such as DND, but their employees use the Town's infrastructure to make their journeys to and from work;
- ◇ Work with BC Transit to improve service within and through the town;
- ◇ Mitigate the effects of automobile emissions and other pollutants through landscape and road drainage treatment techniques;

- ◇ Develop a schedule for implementation of recommended network improvements based on funding resources and priorities; and
- ◇ The Town build on its success in obtaining grant funding and use it's financial resources in matching government grants for identified municipal infrastructure upgrades;

The status of the modal networks and project documentation are summarized below:

Bicycle Network

STATUS The review of road bicycle network has been completed and a commuter bicycle network recommended as shown in Figure 5.

Improvements have been identified and order of magnitude cost developed. The bicycle projects, as part of the road cross-section, were reviewed and prioritized as part of the road network process described above and the complete listing of the projects are contained in Appendix J.

Sidewalk Network

STATUS The Pedestrian Plan and Sidewalk Condition Inventory has been completed. The network has been identified, its condition evaluated and entered into a database.

The connectivity of this modal network to bus stop locations, trails and paths has been analyzed. These modal networks have also been mapped in conjunction with major land uses to ascertain the amount and type of access being provided and the opportunities for modal transfers examined.

The results of these analyses were used to determine what gaps exist in the modal networks and their priority. A listing of these projects is provided in the report Pedestrian Plan and Sidewalk Condition Inventory.

Paths, Trails

STATUS The trails network has been identified as part of Parks and Trails Master Plan. Data on paths was collected in conjunction with the conduct of the Pedestrian Plan and Sidewalk Condition Inventory project.

As indicated in the previous section, the alternative mode networks need to be integrated. A gap analysis has been completed to identify where improvements and connectivity can be improved. Order of magnitude costs have been compiled and a program developed.

Road Network

STATUS Road network has been analyzed and a recommended functional classification developed as illustrated in Figure 10.

Conceptual designs have been prepared for the major roads within the community with associated order of magnitude costs. The recommended road improvements are described in Chapter 6 and contained in Appendix H.

Projects have been reviewed and prioritized in conjunction with the Transportation Advisory Committee of the Town of View Royal. The complete listing of road projects is shown in Appendix J.

Significant land uses

STATUS Land uses are documented in the OCP and have been mapped to the modal networks after the gap analysis, connectivity and inter-modal transfer opportunities were identified.

Sustainable Transportation Planning

STATUS The principles as outlined by Transport Canada, and how the Town's plans and programs respond to those principles have been documented. Additional clarity on the achievements to date and providing direction for the future will be available after the current OCP update is complete and the OCP and TMP are harmonized.

Working Papers

STATUS As well as providing strategic direction and guidance, there is also an opportunity to provide more operation information in terms of standards, procedures and implementation recommendations for such topics as signal warrants, cross-walk warrants, warrants for turn lanes and traffic calming. At this time, this level of detail will not be included in the TMP but rather will be documented in Working Papers. They are intended to provide a starting point in these areas and an opportunity to learn from other jurisdictions. For example, the City of Victoria is referenced in traffic calming literature as a leading example of successful implementation of community-based Neighbourhood Traffic Management Plans.

The two working papers compiled in conjunction with this project are WP#1: Technical Standards and WP#2: Implementing Traffic Calming.

Plan Management

- STATUS In some respects the hardest part is yet to come. This TMP is a starting point and it is up to the Town to ensure that it is carried forward. This means that there needs to be:
- ◇ Regular updates in conjunction with the OCP;
 - ◇ Opportunities for public input during planning, implementation and evaluation;
 - ◇ Processes in place to incorporate changing conditions both internal and external to the Town; and
 - ◇ Programs to measure progress in order to build on strengths and address weaknesses.

A broader based approach focusing on all modes of transportation is needed. It is critical that alternative modes continue to be promoted and implemented as viable alternatives to automobile-based solutions. The existing infrastructure of sidewalks, bicycle lanes, trails and paths need to be considered as part of a hierarchy for mobility and access. The missing links in the modal networks need to be filled and the modes need to be integrated so that transfers between modes are facilitated. Bus transit, commuter rail, and LRT should continue to be actively promoted and supported by the Town as a sustainable solution to regional transportation issues and lands for future rail transit corridors and stations need to be identified and protected.

View Royal was first settled in the 1850s when Dr. John Helmcken purchased 640 acres of farmland from the Hudson's Bay Company. The Town of View Royal was incorporated in 1988, and is a small municipality of 1,731 hectares and a population of approximately 8,800 people. The Town is located between the Westshore area and the municipal centers of Saanich and Greater Victoria of the Capital Regional District as shown in Figure 1.

In 2006, The Town of View Royal retained the services of Bunt & Associates Engineering Ltd. to assist in the development of a Transportation Master Plan (TMP) for the Town. As outlined in the Request for Proposals, it was essential that the strategies used in the development of this transportation study conform to the Transport Canada "Strategies for Sustainable Transportation Planning: Summary of Principles and Options", as seen in Appendix A, as well as the Capital Regional District's Regional Growth And TravelChoices strategies.

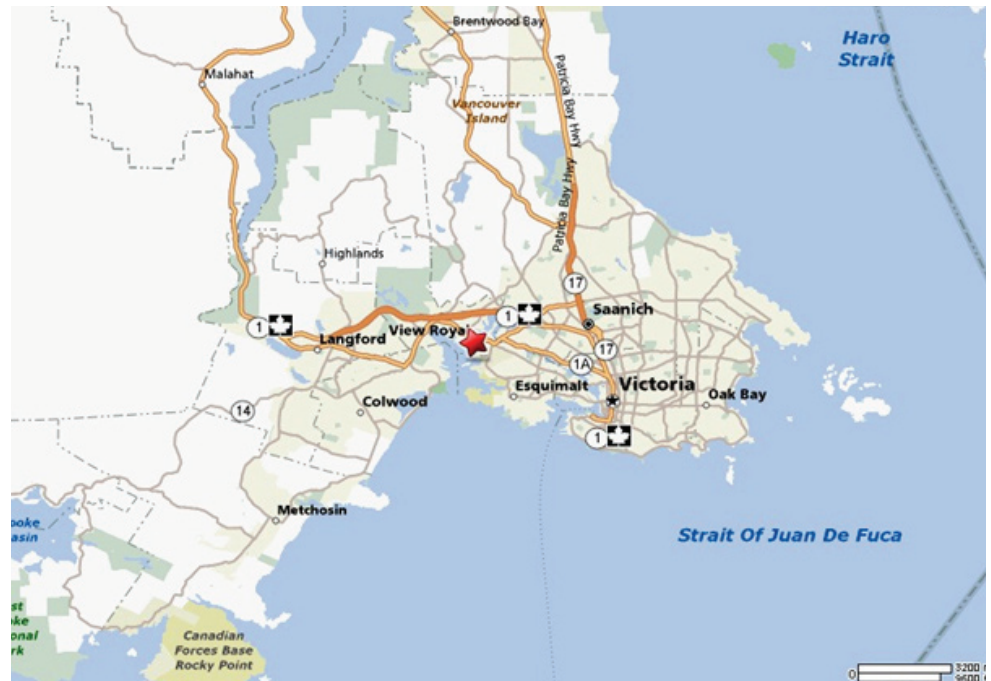


Figure 1- Town of View Royal Area Plan

The overall purpose of the plan is to identify a vision for a transportation system that is integrally linked with the Town's Official Community Plan (OCP). The plan is to describe how the transportation facilities and services will evolve to serve the Town for the foreseeable future. Improvement projects are identified and prioritized based on the present and future needs of all modes of transportation. The Transportation Master Plan will provide the framework for the Town to meet these needs in a systematic manner.

The transportation plan is needed to manage the ongoing changes that are occurring within the Capital Region area in conjunction with the OCP. Significant new developments have occurred both internal and external to the Town and this pattern will likely continue for several more years. Traffic growth has continued, giving rise to additional concerns regarding congestion and safety for all road users.

The specific issues that reflect both existing problems and future questions include:

- ◆ Role of other modes of transportation and the need for improvements to bicycle, pedestrian, and freight systems;
- ◆ Roadway safety and speed management.;
- ◆ Ongoing improvement of the transportation system to keep pace with land development;
- ◆ Traffic capacity along major arterials, including Island Highway, Helmcken Road, and Admirals Road;
- ◆ Identification of needed rights-of-way and access control; and
- ◆ Lack of streetscape continuity and aesthetics on arterial and collector roads.



In response to these issues, the TMP provides an opportunity to clearly and firmly establish the relationship between land use, development policy and transportation in association with the OCP.

The Transportation Master Plan should be dynamic and reflect the vision of the community and any changes as it evolves and is articulated in the Official Community Plan. The TMP must be kept current in concert with the OCP and updated on a regular basis. In this sense, the preparation of this plan is only the beginning.

2.1 background

The Town of View Royal, which forms the Study Area as seen in Figure 2, is bisected by four major transportation routes linking the City of Victoria to the growing communities to the west and north sections of the region. They are the Trans Canada Highway (TCH), Island Highway, E&N Rail corridor and the Galloping Goose Regional Trail.

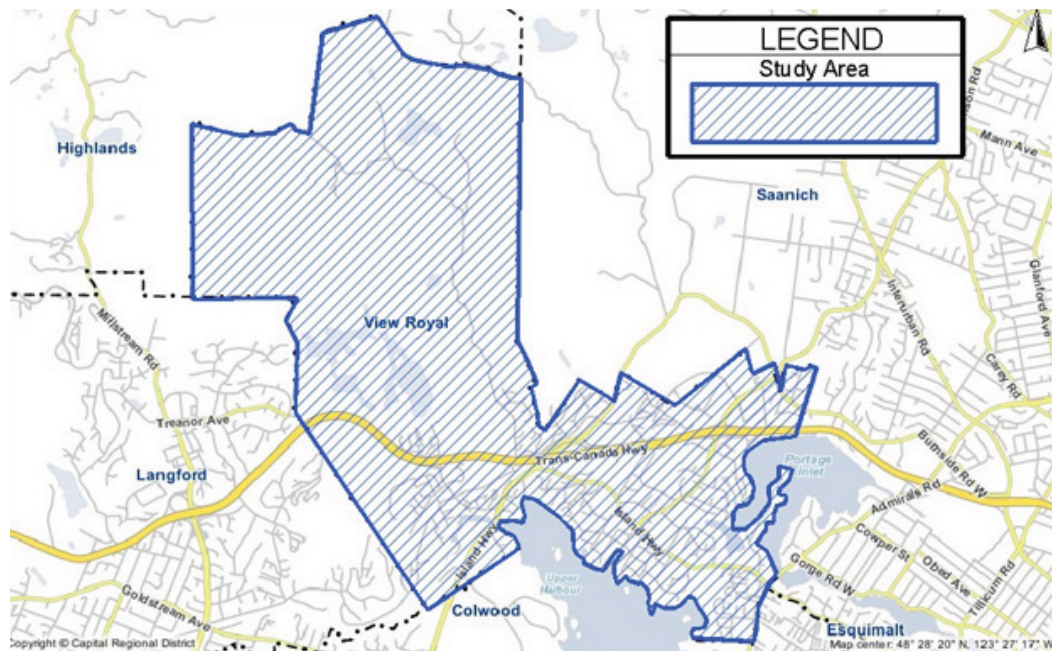


Figure 2 - Study Area

The rapid development occurring in the surrounding areas has added pressure to the area road system, particularly on the Island Highway, and future development is expected to continue this pattern. As well, several developments within the Town are likely to occur in the near future, including the Atkins Road area, the Casino expansion, other lands near the Victoria General Hospital, and the Thetis Cove development.

Additionally, portions of the Songhees and Esquimalt Nations lands adjacent to Admirals Walk are currently in the planning stages for development options. These developments will have a significant impact on the Admirals Road corridor which forms the eastern boundary of the Town. Present traffic patterns without these developments contribute to significant congestion at the Admirals Road / Island Highway / Craigflower Road intersection during the AM and PM commuter peak periods. The physical limitations on the cross-sections of Admirals Road, the Craigflower Bridge, and the span of the E&N overhead crossing of the Island Highway all cause congestion and constrain the throughput of vehicular traffic during peak periods of travel. The plan addresses future growth both within and external to the Town of View Royal.

The plan carefully addresses future growth both within and external to the Town of View Royal.

In addition to the challenges posed by traffic growth, the Town has a major opportunity to alter the nature of the Island Highway corridor to better reflect its OCP goals. Since 1998, the responsibility for the Island Highway has been divested to the Town. While it has focused on vehicle throughput in the past, it will now balance transportation and land use objectives and integrate pedestrians, cyclists, and transit with vehicular traffic along the length of this major corridor. A key component of the project is the development, evaluation and recommendation of appropriate improvements to support these objectives.

Other areas experiencing significant changes include the Atkins Local Planning Area (LPA) with continued growth and mixed use developments proposed in the Burnside and Hospital LPAs.

2.2 project objectives

The intent of the Transportation Master Plan is to guide the development of a transportation network for the Town of View Royal that reflects the expressed desire of residents and businesses to have increased travel choices. This would be accomplished through the provision of additional and improved facilities for bicycles, pedestrians, and public transit and providing the Town with tools to support their planning program.



Historically, transportation planning and engineering have looked at increasing road capacity in response to the demand for vehicular trips. This approach has resulted in ever increasing traffic volumes and the associated congestion. The need to reduce the dependence on single occupant vehicles has never been met very effectively on a widespread basis. This focus on capacity improvements has the effect of attracting more vehicles to the roadway system, rapidly consuming any capacity gains that are achieved through roadway improvements. This in turn contributes to higher levels of pollutants and degrades the safety of non-vehicular users of the corridors such as pedestrians and cyclists. This

ongoing pursuit of additional capacity is a cycle which never achieves the desired objectives and typically reverts to a congested condition much earlier than predicted. Managing the congestion, diverting the demand for mobility to other modes of transportation and achieving a balance for all modes of transportation and types of land use is a more sustainable and achievable approach.

The emphasis of this plan is on vehicular trip reduction to improve environmental conditions for alternative modes, and to minimize the amount of vehicular capacity improvements while improving safety for all roadway users. Any increases in capacity will be incremental and achieved by reducing friction or impediments to movement as opposed to adding additional lanes for vehicular traffic.

While the above describes the overall goals for the transportation plan, the opportunities for input from various stakeholder groups and the public also resulted in the development of several objectives for the Transportation Master Plan. The following reflect these goals from both the transportation and planning perspectives:

Mobility

The transportation network should be developed in a manner that provides safe, convenient routes and facilities that allow residents easy access to commercial and recreational facilities by their choice of cycling, walking, bus transit or driving.

Transportation Performance

The transportation system should provide efficient quantity and quality of service with needed capacity, reasonable speed, convenience, and safety for all users.

Non-Motorized Travel

The transportation system should enhance the quality of life of the community by providing a network of interconnected and safe bicycle paths, routes, trails, and pedestrian facilities.

Community Development

The transportation system should support and enhance economic development within the region.

Environmental Protection

The transportation system should recognize the environmental resources of the region and minimize negative encroachments and disruptions on such areas. Measures should also be taken to reduce vehicle emissions through road design and manage pollutants from runoff.

Integration with OCP

The transportation plan should support and complement the adopted Official Community Plan (OCP) and should be updated on a regular basis.

Inter-Agency Coordination

In conjunction with the transportation plan, a spirit of commitment to interagency coordination and cooperation should continue to be fostered in the region.

The transportation system should enhance the quality of life of the community by providing a network of interconnected and safe bicycle paths, routes, trails, and pedestrian facilities.

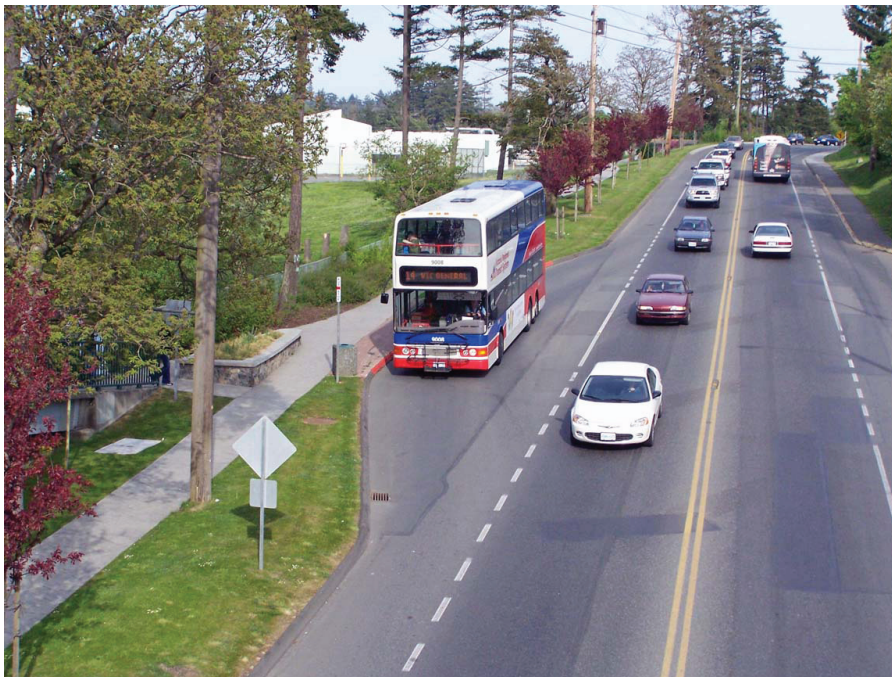
Financial Feasibility

The transportation plan must be financially feasible. Funding from other sources in the form of Grants and / or Development Cost Charges should be sought based on the objectives of the plan. When appropriate, Development Cost Charges should be reserved for use as matching funds in grant applications.

Commitment to Implementation

The transportation plan should be supported by a commitment to implement the recommended improvements according to an identified schedule as resources permit.

It is expected that ongoing development will result in increased demand for vehicular, pedestrian, cyclist and transit infrastructure and capacity in order to deal with overall traffic congestion, safety, and quality of life issues. As indicated earlier, increasing vehicular capacity has typically not provided a long term sustainable solution. In this particular instance, the local topography and existing urban development also limit options for these types of solutions.



A broader based approach focusing on all modes of transportation is needed. It is critical that alternative modes continue to be promoted and implemented as viable alternatives to automobile-based solutions. The existing infrastructure of sidewalks, bicycle lanes, trails and paths need to be considered as part of a hierarchy for mobility and access. The missing links in the modal networks need to be filled and the modes need to be integrated so that transfers between modes are facilitated.

Bus transit, commuter rail, and LRT should continue to be actively promoted and supported by the Town as a sustainable solution to regional transportation issues and lands for future rail transit corridors and stations need to be identified and protected.

2.3 project methodology

To address the challenges and opportunities outlined above, the scope of the Transportation Master Plan included the following major elements:

- ◆ Inventory and analysis of existing infrastructure for alternative modes including cycling, pedestrian, bus and rail transit;
- ◆ Creation of peak hour computer models of the project study area, that accurately depict existing and future traffic volumes through consideration of both internal and external growth scenarios;
- ◆ Development of growth scenarios including a rapid growth (full build-out by 2015) and a slow growth scenario (full build-out by 2026) to correspond to the horizon year forecasts of the Capital Regional Districts EMME2 model. Full build out is defined as the development of lands within the Town as indicated by the current Land Use Zoning and OCP Bylaws;
- ◆ Analysis of both existing and future traffic conditions without improvements to assist in the development of improvement options and mitigation measures;
- ◆ Development, testing and evaluation of multi-modal improvement and mitigation options. A significant component of these measures will include identification of potential strategies for reducing single occupant and other vehicle trips through the application of Transportation Demand Management (TDM) and encouraging alternative travel modes for future developments within the Town;
- ◆ Establishment of a final set of recommended improvements and measures, including cost estimates and a proposed schedule. These recommended improvements are illustrated by overlaying conceptual designs of the recommended measures onto an orthophoto using AutoCAD;
- ◆ Incorporation of traffic calming initiatives;



- ◆ Provision of technical guidelines related to signal and crosswalk warrants, implementation of traffic calming measures, design practices, etc.; and
- ◆ Preparation of a report documenting the study process and outcomes.

A critical component of the project was the need for input in order to achieve the goal to provide a safer and more pleasurable experience for pedestrian, cyclist and vehicular traffic while enhancing the streetscape on the roadway and the abutting properties.

These scope elements were carried out within a comprehensive framework of public and key stakeholder consultation and feedback. The project involved significant communication between Bunt's project team, Town of View Royal staff, residents, and neighbouring communities and stakeholders to ensure acceptable and supportable future transportation improvements throughout the community.



3.1 municipal

The Town of View Royal has shared boundaries with several other jurisdictions. To the east is the Township of Esquimalt as well as the Songhees Nation, while the CRD's largest municipality, the District of Saanich lies to the north and northeast. To the northwest is the District of Highlands and the City of Langford is to the west. The southwest border is shared with the City of Colwood while the southeast border is shared with the Esquimalt Nation. The other shared borders of View Royal are with Esquimalt Harbour and Portage Inlet.

The cities of Colwood and Langford have been actively encouraging development for the past decade. Recent development proposals such as Westhills in Langford and Royal Bay, plus a proposed redevelopment in the Colwood Corners area, continue that trend. Esquimalt is primarily urban while Saanich is a mix of developed land and rural properties and the recent proposed redevelopment of the Town & Country Shopping Centre will augment the area's designation as a major centre within the Region. The District of Highlands is mostly rural. The Songhees and Esquimalt First Nations are both interested in future development but there is nothing definitive at this time.

The Town of View Royal has expressed a consistent and strong desire for the provision of additional infrastructure for alternative modes of transportation as well as resistance to increased capacity on major municipal routes within their community. This is captured in the current Official Community Plan (Bylaw No. 331, 1999, Consolidated December 2006).

The vision developed at that time was for:

“a quiet traditional “small town” residential community with a modest rate of growth. It is made up of sustainable neighbourhoods that are desirable places to live – convenient, walkable, attractive, affordable and safe. These neighbourhoods will be self-sufficient in many respects and be connected to one another through greenspace corridors and pedestrian/cyclist-friendly streets. The impact of major transportation corridors that pass through View Royal will be minimized,”

This vision, although articulated in 1999, is consistent with the vision and input received from the leaders of the community and residents of the community at Open Houses during the development of this Transportation Master Plan.

This overall vision is complemented with the Town's seven goals:

1. *To recognize the unique "small town" and natural characteristics of View Royal that are highly valued by its residents, and to maintain these values as much as possible as the community grows;*
2. *To confirm View Royal as an environmentally conscious and responsible community;*
3. *To develop as strong a system of community services, parks and recreation facilities as can reasonably be provided within the financial means of the municipality;*
4. *To provide suitable land areas for commercial and institutional activities as a means of providing local employment opportunities, and broadening the municipal tax base;*
5. *To recognize the regional role of the community as a link in major transportation systems, and to cooperate with adjacent municipalities and senior governments in regional interests, while also protecting local values;*
6. *To promote a strong sense of community in all areas and neighbourhoods of the Town; and*
7. *To enhance quality of life for all citizens of View Royal by facilitating effective planning in conjunction with an informed and involved community.*

These goals are further developed into statements of intent or objectives which are priority issues for the Town:

- ▶ Managing and Balancing Growth;
- ▶ Housing;
- ▶ Environment;
- ▶ Transportation;
- ▶ Economic Development;
- ▶ Parks and Recreation;
- ▶ Utilities;
- ▶ Social Planning; and
- ▶ Heritage Resources Conservation.

It is also recognized that the municipal vision occurs within a regional context and a Regional Growth Strategy that was adopted by the CRD. The Town of View Royal subsequently amended the OCP and provided the following regional context statement:

“View Royal will have a series of economic centres providing expanded retail, professional, financial and convenience services. Single family detached housing will remain the predominant housing form with some provision made for other types of housing. A network of foot and cycle paths will provide neighbourhoods with access to shopping, recreation and natural open space. Natural amenities associated with shorelines, streams, estuaries, hillside and forested areas will be protected.”



More details of the current OCP, and the Town's response to the eight strategic directions of the RGS detailed in the next section, can be found on the Town's web site.

3.2 regional

The Capital Regional District (CRD) has adopted a Regional Growth Strategy (RGS) to manage future growth and development in the Victoria area in a more sustainable manner. The RGS has eight underlying strategic initiatives, as listed below, which are critical in the achievement of this 25 year program for action by the region and its member municipalities.



The RGS intends to promote a balanced and sustainable transportation system that is reasonable and affordable. The RGS includes a series of goals and targets for the transportation system to be achieved over the next 25 years. To help achieve these goals, a transportation strategy entitled 'TravelChoices' was developed.

Its mission is:

“To significantly increase the proportion of people walking, cycling, using transit, ride-sharing and using other alternatives to driving alone.”

By 2026, travel demand in this region is expected to grow by over 400,000 trips per day and if left unchecked, congestion and mobility can become key regional issues. The goal of this strategy is to mitigate the impacts of future growth by encouraging 300,000 of these future trips to use the priority modes - walking, cycling, transit and ride-sharing.

TravelChoices

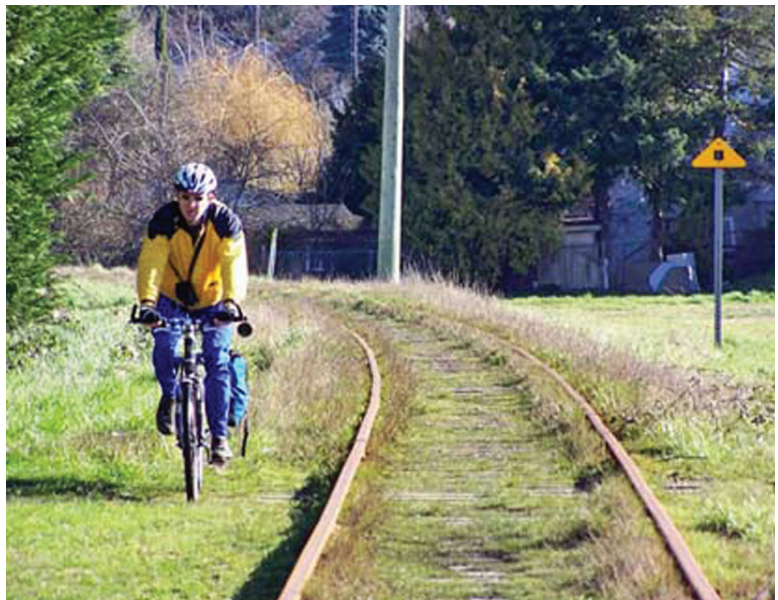
TravelChoices sets out objectives for the better integration of land use and transportation between and within Major Centres, the enhancement of alternatives to driving alone, and the management of roadway investment to better support the mobility and safety of priority travel modes – walking, cycling, transit, and commercial vehicles for goods movement.



Although the Town of View Royal has not been identified as a Major Centre within the RGS framework, the Town plays a key role within the Capital Region due to the four major transportation corridors that traverse the community. The only continuous east-west routes connecting the Westshore to the Greater Victoria area are the TCH and Island Highway which bisect the Town of View Royal. The provided road capacity results in major vehicular movements with the associated congestion, noise and pollutants, in an order of magnitude higher than that generated by the municipality's residents.

The other transportation corridors of the E&N Rail corridor and Galloping Goose Regional Trail provide capacity for pedestrian and cycle traffic as well as the potential for future commuter rail routes.

The potential for increased infrastructure for alternative modes of transportation and the RGS strategic directions are consistent with the desires expressed by the Town of View Royal in terms of providing choices for their residents for other modes of transportation while balancing the regional needs for commuter travel through their community.



3.3 provincial

The Province of British Columbia, through the Ministry of Transportation is a stakeholder in the transportation network for the Town of View Royal. They manage the Trans Canada Highway, an arterial highway of provincial and national importance, which goes through the middle of the town. In addition, they have jurisdiction over Six Mile Road and a section of Admirals Road, all major roads within the community.

They have approval authority under the Transportation Act for development within 800 metres of an intersection on public provincial highway which has been designated as a controlled access highway such as the TCH.

Other provincial jurisdictions with a vested interest in development and transportation are the Ministry of Tourism, Sport and the Arts and the Ministry of Environment. The former contains the Archaeology Branch and provincial archaeology programs are designed to encourage and facilitate the protection, conservation and public appreciation of the provinces archaeological resources. With the history of Esquimalt and Songhees Nations in this area, all works related to transportation must be conducted with full awareness of the environment and potential for discovery of archaeological resources.



The Ministry of Environment is concerned with the by-products of land use and transportation in terms of air quality and surface runoff from pollutants associated with transportation. The Town has recently received grant money to improve the road infrastructure in the section of the Island Highway from Admirals Road to Helmcken Road and a major factor in the application was the use of rain gardens and bioswales to treat runoff prior to its entering Portage Inlet. As well, the body of scientific evidence relating proximity of residential development to freeways and major roads demonstrates a casual relationship to increased risks of developing or exacerbating health problems associated with respiratory and heart diseases.

In addition to provincial ministries, there are other provincial level organizations such as Smart Growth BC who are espousing land use and development principles that are directed towards similar objectives in terms of wanting to enhance quality of life while preserving the natural environment and being fiscally aware of long term implications. Their ten principles are consistent and compatible with the strategic directions adopted by the CRD in 2003.

3.4 federal / national

Sustainable development at the federal or national level can be traced back to the 1995 report entitled “A Guide to Green Government”. This was when the Government of Canada adopted the definition of sustainable development from the 1987 report entitled “Our Common Future”, known as the Bruntland Report.

“Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

In 1995 the Canadian government amended the Auditor General Act to include a legal requirement for certain departments and agencies to prepare and table sustainable development strategies every three years. It also created the Commissioner of the Environment and Sustainable Development to provide parliamentarians with objective, independent analysis and recommendations on the federal government’s efforts to protect the environment and foster sustainable development. As well, the Commissioner audits the federal government’s performance in areas such as climate change, ozone depletion, management of toxic substances and greening government operations in order to encourage the government to be more accountable for greening its policies, operations, and programs.

This national focus effects many organizations with varying degrees of interest and funding support for sustainable transportation at the local level. Infrastructure Canada is one such organization that administers the Gas Tax Fund which in the six years from 2005 to 2010 will provide \$635.6M dollars to British Columbia municipalities.

The Infrastructure Canada web site also provides a link to the External Advisory Committee on Cities and Communities which examined the issues facing communities and summarized them in a publication “From Restless Communities to Resilient Places: Building A Stronger Future For All Canadians”. It provides the results of their investigations and concludes that the transfer of responsibilities from federal to provincial to municipal levels of government was not accompanied by the autonomy and financial resources to allow the local levels to make the decisions needed in order to service consumers and taxpayers in a more effective manner. Governments have to recognize the interdependence of what they do and how the collective decisions of local orders of government can add up to significant national effects. The Gas Tax Fund is one tangible response to this identified need from senior government.

“Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

Transport Canada again is a significant voice in the increasing chorus of agreement about the principles and need for sustainable land use and transportation planning. Their publication “Strategies for Sustainable Transport Planning: A Review of Practices and Options”, (which is one of the guiding documents of this plan), adds to the documentation in this area and is consistent with the strategic directions being articulated at the municipal, provincial and federal level. Their Urban Transportation Showcase Program continues to be an effective communication vehicle for demonstrating how communities can make these strategies work for their purposes.

A non-governmental agency, but one of national scope, is the Transportation Association of Canada who, in conjunction with Transport Canada and the publication referenced above, has also articulated the need for “Strategies for Sustainable Transportation Planning”. Their interest extends to the practical application of procedures as illustrated in their publication “Canadian Guide to Neighbourhood Traffic Calming”.



4

existing conditions

4.1 demographics

The Town of View Royal is one of the smaller municipalities within the Capital Regional District at 1,731 hectares and as described earlier, is uniquely located between the Westshore communities and the core business and employment area of the CRD which is the City of Victoria.

As seen in Table 1, View Royal has been one of the faster growing communities in the CRD with a population increase of over 46 per cent between 1991 and 2006, which is slightly higher than that of Langford. In addition to the growth within the Town, there has been significant growth in the Westshore communities. The communities of Langford, Colwood and Highlands have grown a combined 30% since 1991. It is the combination of this growth, and its associated need for vehicular mobility that creates issues within the Town of View Royal.

Table 1: Growth in Population/Occupied Private Dwellings in the CRD

VARIABLE		CENSUS YEAR			
		1991	1996	2001	2006
Colwood	Population	13,468	13,848	13,745	14,687
	% Change ⁽¹⁾		2.82%	-0.74%	6.85%
	Dwellings ⁽²⁾		4,685	4,865	5,501
	% Change			3.84%	13.07%
Esquimalt	Population	16,192	16,151	16,127	16,840
	% Change		-0.25%	-0.15%	4.42%
	Dwellings		7,355	7,565	8,007
	% Change			2.86%	5.84%
Highlands	Population	1,094	1,423	1,674	1,903
	% Change		30.07%	17.64%	13.68%
	Dwellings		500	605	704
	% Change			21.00%	16.36%
Langford	Population	15,642	17,484	18,840	22,459
	% Change		11.78%	7.76%	19.21%
	Dwellings		6,395	7,050	8,650
	% Change			10.24%	22.70%
Saanich	Population	95,583	101,388	103,654	108,265
	% Change		6.07%	2.23%	4.45%
	Dwellings		39,690	41,515	44,513
	% Change			4.60%	7.22%
View Royal	Population	5,996	6,441	7,271	8,768
	% Change		7.42%	12.89%	20.59%
	Dwellings		2,585	3,020	3,350
	% Change			16.83%	10.93%
Capital Regional District	Population	299,550	317,989	325,754	345,164
	% Change		6.16%	2.44%	5.96%
	Dwellings		135,495	142,135	152,482
	% Change			4.90%	7.28%

Note (1) Total percentage change over five years
(2) Occupied private dwellings

To respond to the ongoing growth in population and the associated demand for vehicular transportation, the Town of View Royal strives to achieve a balance of their municipal and regional responsibilities and continue to maintain the quality of life that is the foundation for their community.

4.2 official community plan

Section 3.1 of this report briefly outlines the Municipal Context of this study and references the Town of View Royal's Official Community Plan. The stating of the Town's vision, goals and objectives provide the framework for policies related to transportation which are developed in more detail in Section 3.4 of the OCP. They reinforce the vision and desire of the community to see their roads as community resources for the benefit of all users, not just vehicular traffic. This emphasis on pedestrian traffic, sidewalks, paths and trails, cycling, public transit and traffic calming are reflected in this study's approach as well as being consistent with the regional objectives from the RGS.

These directions are to apply equally to the eight Local Planning Areas within the Town (illustrated in Exhibit 1 in Appendix B) and tools to achieve these goals are contained in such local bylaws as the Land Use Bylaw No. 35, 1990 (Consolidated December 2006) and the Truck Route Bylaw, No. 456, 2002.

Two graphic representations of the direction outlined for the community are contained in Maps 5A and 5B of the OCP which are the Road Network and Cycling Network respectively. They are illustrated as Exhibit 2 and Exhibit 3 in Appendix B.

road network

The road network map shows the functional classification of the major routes within the community.

Arterial

Trans Canada Highway

Major

Admirals Road

Burnside Road West (east of Helmcken Road)

Helmcken Road (from Island Highway to municipal border)

Island Highway

Six Mile Road

Watkiss Way (between Burnside Road West and Helmcken Road)

Collector

Atkins Road

Burnside Road West (from Watkiss Way to municipal border)

Helmcken Road (south of Island Highway to View Royal Avenue)

Highland Road

View Royal Avenue

Watkiss Way (from Highland Road to Burnside Road West)

This emphasis on pedestrian traffic, sidewalks, paths and trails, cycling, public transit and traffic calming are reflected in this study's approach as well as being consistent with the regional objectives from the RGS.

The functional classification of routes is a hierarchy based on whether the function of the route is to provide mobility or access to lands. Arterial routes or highways provide mobility by restricting direct access to lands and using design parameters to achieve higher speeds. They will accommodate volumes in excess of 25,000 vehicles per day (vpd) with design speeds of 80 to 110 km/h and average operating speeds of 70 to 110 km/h.

Major routes are primarily to provide mobility as access to lands is a secondary function. They have a capacity up to 25,000 vpd with a design speed in the range of 50 to 100 km/h and an operating speed of 40 to 90 km/h. Access is typically limited to crosswalks and traffic signals while direct access to lands is discouraged.

Collectors balance the needs for mobility and access to lands and cover a range of capacity from 1,000 to 12,000 vpd. However the more typical range is 3,000 to 5,000 vpd with design speeds ranging from 50 to 80 km/h and the average operating speeds being from 30 to 70 km/h.

Local roads are primarily to provide access to individual lands and as such accommodate volumes up to 1,000 vpd. Flow is not continuous and the design speeds are from 30 to 50 km/h while operating speeds range from 20 to 40 km/h.



bicycle network

The cycling network from the OCP contains routes classified as follows:

Commuter

- Admirals Road
- Helmcken Road (north from Island Highway to municipal border)
- Island Highway
- Six Mile Road

Recreational

Highland Road (connecting to Galloping Goose)
Burnside Road West (from Watkiss Way to municipal border)
Chilco Road
Hallowell Road (from Admirals Road to shoreline)
Heddle Avenue to Burnett Road to Helmcken Road
Helmcken Road (south of Island Highway)
St. Giles Street South (east of Helmcken Road to municipal border)
View Royal Avenue – Gibraltar Bay Road – Knollwood Road
Connection of View Royal Avenue and Hallowell Road through
Portage Regional Park

In reference to the cycling network, some of the linkages were potential routes which have not been developed at this time. Examples in Exhibit 3 are the illustrated connections from Knollwood Road to Parsons Bridge and the link through Portage Park connecting View Royal Avenue to an extension of Hallowell Road to the shoreline of Thetis Cove as discussed later in this report.



4.3 infrastructure

roads

As depicted in the following Figure 3, the roadway analysis component of the TMP included the following routes;

Admirals Road
Atkins Road
Burnside Road West
Hallowell Road

Helmcken Road
Highland Road
Island Highway
Jedburgh Road

Rudyard Road
Six-Mile Road
Stormont Road
View Royal Avenue
Watkiss Way

The analysis considered the roadways in their entirety. Classification, function, safety, cross-sections, grades, speeds, design criteria, intersection controls, access management, and alternative mode facilities were all studied prior to establishing recommendations for improvements.

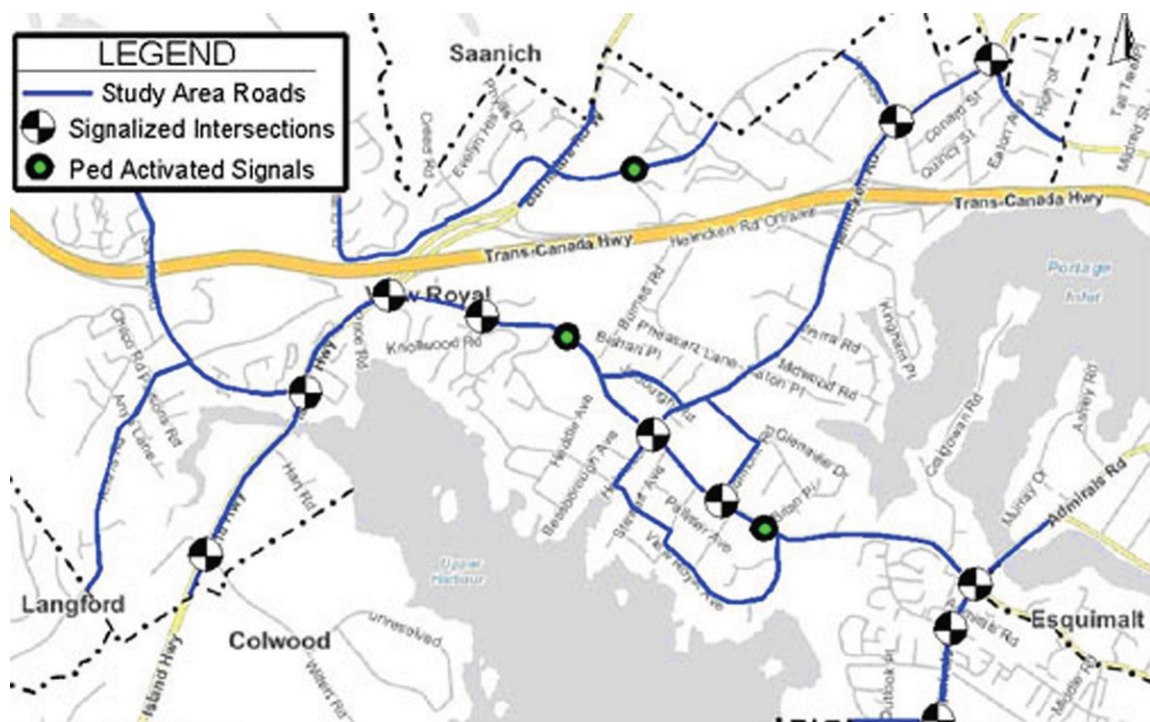


Figure 3 - Study Area Road Network

traffic signals

As seen in the previous Figure 3, there are presently 11 signalized intersections within the Town of View Royal and 3 pedestrian activated signals.

The purpose of a traffic signal is to assign the right-of-way to conflicting streams of vehicles and pedestrians at an intersection. A traffic signal is not considered to be a safety device, however certain types of collisions may be reduced with the installation of a traffic signal. Right-angle collisions are reduced while rear-end collisions may increase.

Most traffic signal warrant systems attempt to determine if overall vehicle and pedestrian delay at an intersection would be reduced if a traffic signal were installed, or to judge if traffic crossing the uncontrolled traffic stream is experiencing unacceptable delays.

The Transportation Association of Canada (TAC) has developed a warrant procedure for the installation of traffic signals. Their **Manual of Uniform Traffic Control Devices for Canada** (MUTCDC) is a primary source for this type of warrant and is discussed in more detail in Working Paper No. 1: Technical Standards.

cross sections

Admirals Road



Admirals Road, functionally classified as a Major Road, lies at the eastern border of the Town of View Royal and the portion south of the Island Highway is currently under the jurisdiction of the Ministry of Transportation. Songhees Nation lands are to the east and Esquimalt Nation lands to the south of this route. The District of Saanich lies to the north and the Township of Esquimalt to the east and south.

In the northbound (NB) direction of travel from Hallowell Road, Admirals Road changes from one lane to two lanes, including a double left turn (LT) lane at Island Highway and then tapers back down to one lane to cross the Craigflower Bridge. In the southbound (SB) travel direction, Admirals Road is one lane across the Craigflower Bridge, widening to two lanes at Island Highway and continuing south where it reduces to a single SB lane at Hallowell Road.

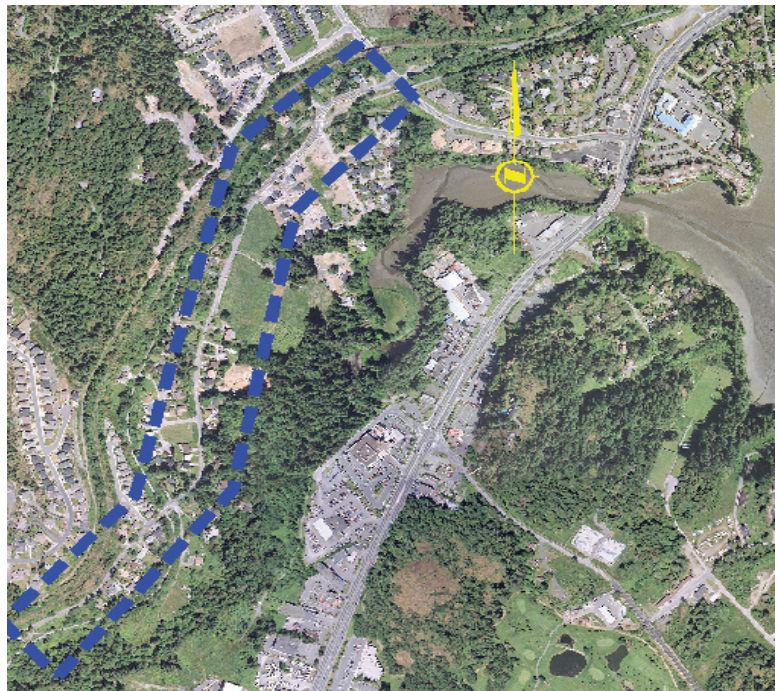
This section of Admirals Road is constructed with curb and gutter plus concrete sidewalks on the west side between Island Highway and Hallowell Road. On the east side, there are wide paved shoulders and an open ditch. In the vicinity of Hallowell Road, there are offset T intersections on the east side of Admirals Road.



Atkins Road

Classified as a Collector Road, Atkins Road provides access to residential development and is a secondary route between the Town and the City of Langford. Significant development has occurred along the section of road within Langford, resulting in increased traffic over the past ten years. The cross section along this route is one lane in each direction with narrow sections along with significant vertical and horizontal curves near the municipal border.

The Galloping Goose Regional Trail crosses the roadway at two locations and some traffic calming devices have been installed to improve safety at those locations. The section of road fronting the residential developments adjacent to Anya Lane and Parsons Road has been constructed to a high standard with a boulevard strip separating a concrete sidewalk.



Burnside Road

Portions of Burnside Road West lie within the Town boundaries with the remainder within the District of Saanich. The westernmost portion functions as a collector with varying cross section widths and no facilities for alternative modes. This length has many vertical and horizontal curves and smaller sections with limited sight distance.



The section east of Helmcken Road, functionally classified as a Major Road, has a consistent cross section width but no cross-section width for alternative modes. This section of roadway is an important link to Spectrum High School.



Hallowell Road

Hallowell Road currently functions as a Local Road as traffic volumes are calculated at less than 1000 vehicles per day. This road provides access to the Thetis Cove and the Admirals Walk commercial development. It also has a one-way access from Outlook Place which serves its residential development. With a signalized intersection at Admirals Road, traffic from Aldersmith Place diverts to Hallowell Road in order to utilize the traffic signal to gain access onto Admirals Road in the northbound direction.

Helmcken Road

Helmcken Road within the Town of View Royal has a functional classification as a Major Road north of Island Highway to its municipal border with the District of Saanich and as a Collector Road south of the Island Highway. The road has also been designated as a Disaster Route to serve emergency response vehicles in the event of a catastrophic event.

Its cross-section is typically one lane in each direction except for the section between the overpass of the TCH and Watkiss Way which has two travel lanes in each direction. There are two roundabouts at its intersections with Vickery Road / Kingham Place and Pheasant Lane as well as a traffic circle at Bessborough Avenue. The roundabouts were installed as part of the traffic calming improvements to the section of Helmcken Road between the Island Highway and the TCH.



Highland Road



This route provides access to residential development in the northwest part of town and extends to the border with the District of Highlands. It is classified as a collector route within View Royal and has a two-lane cross section with a sidewalk on a section of the

east side of the road. The traffic volumes on this roadway are low, and there are no designated bicycle lanes.



Island Highway

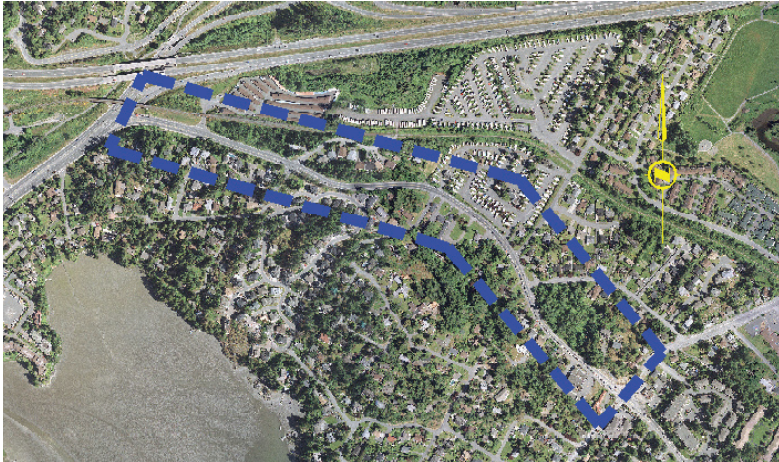
The section of Island Highway between the Colwood municipal boundary and the Thetis overpass has a functional classification as a Major Road within the Town and has a five-lane cross section with the centre lane serving as a left turn refuge facility. The intersections at Wilfert Road, Six Mile Road, and the Burnside Road West / Highway 1 on-ramp are signalized. Some sections of this corridor have been developed with curb, gutter and sidewalk while there are other sections with asphalt shoulders and open ditches. Although this section is designated as a commuter bike route, bike lanes are not provided along the length of this section of the Island Highway.

There are bus pull-outs along this section of the Island Highway but the locations of the stops nearest Six-Mile Road are less than ideal. It appears they were placed in their current locations due to right-of-way constraints near the intersection.



Parsons Bridge has limited ability to meet the needs of alternative modes in its present condition. There are narrow pedestrian facilities on either side of the structure, but no opportunity exists to construct bike lanes on the southbound portion of the bridge deck. There is sufficient

width to construct bike lanes on the northbound portion of the bridge deck, however, the elimination or shortening of the northbound left turn lane servicing the Six-Mile Pub and ultimately Six-Mile Road would be necessary to achieve this.



This section of the Island Highway between the Thetis overpass and Helmcken Road, with a functional classification as a Major Road, consists of a two lane cross-section with left turn lanes at major intersections. There are traffic signals at the intersection with Knollwood Road / Kislingbury Lane and

at Helmcken Road and a mid-block pedestrian activated signal is present just to the east of Prince Robert Drive which provides a safe crossing between bus stops on either side of the road at this location.

Many accesses to private property are present which results in increased vehicle delay and conflicts for all road users. Bike lanes have been incorporated into the cross-section along this roadway segment, however pedestrian facilities are less than ideal, particularly on the south side of the roadway. The horizontal alignment combined with the superelevation, or cross-slope, can make this section of roadway susceptible to accidents, particularly under adverse weather conditions.

The section of Island Highway between Helmcken Road and Admirals Road, with a functional classification as a Major Road, has a two lane cross-section with left turn lanes at three of the four major intersections. There are traffic signals at the intersections with Stormont Road and at Admirals Road.



With significant traffic volumes accessing the Island Highway from Helmcken Road during the morning commute period, this section of roadway experiences volumes that would historically warrant an additional lane in the eastbound direction. This segment of roadway is relatively short as is the period of congestion it experiences.

A large percentage of the traffic turns at Admirals Road. This allows the eastern leg of the intersection, Craigflower Road, to operate efficiently with its current two-lane cross section configuration.

Jedburgh Road



This local road services the residences of Jedburgh Road, Jedburgh Place and Garrington Place. The alignment of Jedburgh Road makes it a natural shortcut between Helmcken Road and Island Highway. The intersection at Island Highway is configured as a right-in / right-out access only, with full movements permitted at its intersection with Helmcken Road.



Rudyard Road

Classified as a local road, Rudyard Road is a secondary route to the Glenairlie Drive neighbourhood. The intersection with Helmcken Road provides full movement, however the Helmcken Road southbound left turn is prohibited during the AM period to discourage shortcutting to the Stormont Road intersection with Island Highway.

Traffic calming devices have previously been installed on Rudyard Road to discourage through traffic. School pick-ups / drop-offs are also performed on this road segment as it is immediately adjacent View Royal Elementary School.

Six Mile Road

Six Mile Road, with a functional classification as a Major Road, is under the jurisdiction of the Ministry of Transportation as this route serves as primary connection between the Island Highway, the TCH and Thetis Lake Park. Six Mile Road also serves residential developments within the Atkins Road Planning Area.

Its cross-section consists of one lane in each direction with separate left turn lanes at Chilco Road and the Six Mile Road / TCH on-ramp. On-street parking is permitted along the southwest portion of the road and a concrete sidewalk exists along the east side of the road to Thetis Lake Park.

Construction has been completed that added a second EB left turn lane on Six Mile Road at the Island Highway and the elimination of the crosswalk on the east leg of Island Highway and changed the signal facing. Further plans exist to construct a sidewalk on the west side of the roadway and a roundabout at the intersection with Atkins Road.





Stormont Road

Stormont Road is the primary access to the Glenairlie Drive neighbourhood. The interaction with Island Highway is signalized and has limited sight distance due to grades on Island Highway and limited building setbacks of abutting properties.

This route is used by southbound Helmcken Road traffic during the AM period trying to shortcut around the congested Helmcken Road / Island Highway intersection.

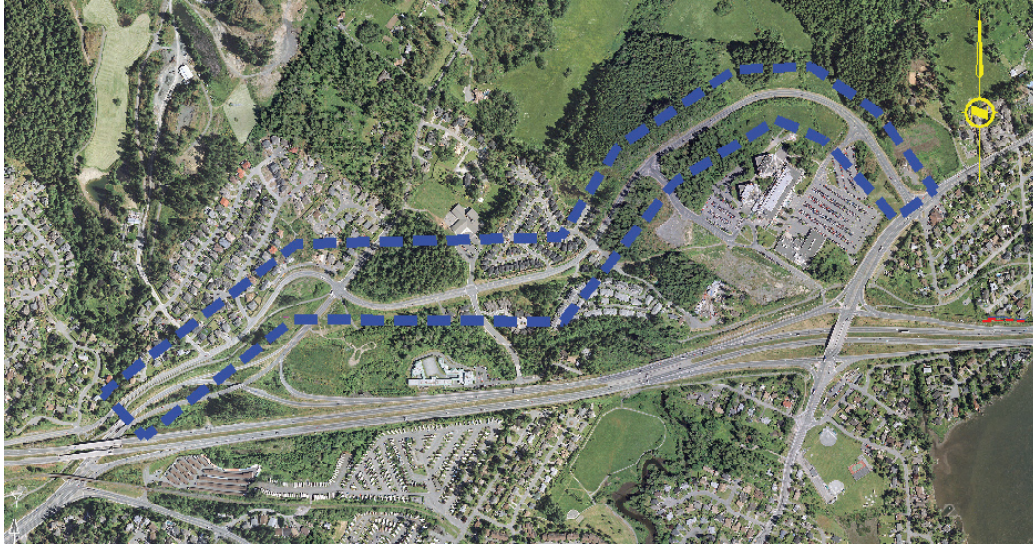
View Royal Avenue



This route is also classified as a collector route and has a two-lane cross section with no consistent facilities for alternative modes such as sidewalks or bicycle lanes.

Portions of the road are narrow with significant horizontal and vertical curves. It is one of the few routes south of the Island Highway which has east-west continuity.





Watkiss Way

Watkiss Way is a Collector Road that is north and parallel to the TCH between Burnside Road West and Helmcken Road and connects residential and future recreational developments west of Burnside Road West and further into the District of Highlands.



The cross section for this roadway within the View Royal portion consists of one lane in each direction with left turn lanes serving Talcott Road and Eagle View Elementary School. There is a pedestrian activated traffic signal at this intersection to allow safe crossing of Watkiss Way at the school driveway.

This route has a wide cross-section with a marked bicycle lane on the east side and paved shoulders for pedestrian traffic. Watkiss Way is an important east-west route for access to Victoria General Hospital.

4.4 operating conditions

Existing average daily traffic volumes were measured for the major routes within the study area. Traffic volumes are important in assessing the role and function of a section of roadway and in determining a preferred cross section.

Where daily traffic volume data was not available, an extrapolation was performed using the ITE method of assuming the PM Peak Hour to be 10.5% of daily traffic volumes. This method has been confirmed in other studies within the region.

The following Table 2 shows the estimated average daily traffic volumes for the major routes. The routes have been divided into sections as there can be significant drops or gains at major intersections.

Table 2 - Daily Traffic Volumes

Estimated Daily Traffic Volumes		
Road Segment		Volume (vpd)
Admirals Road	South of Island Hwy	Approx. 14,000
Admirals Road	North of Island Hwy	Approx. 17,000
Atkins Road		Approx. 3,000
Burnside Road West (Watkiss Way to Helmcken)		Approx. 4,000
Burnside Road West (Helmcken Road EB to Saanich border)		Approx. 5,000
Hallowell Road		Approx. 5,000
Helmcken Road	Island Hwy to TCH	Approx. 6,000
Helmcken Road	North of TCH	Approx. 18,000
Highland Road		Approx. 2,000
Island Highway:	Colwood Municipal Boundary to Thetis overpass	Approx. 42,000
Island Highway:	Thetis overpass to Helmcken Road	Approx. 18,500
Island Highway:	Helmcken Road to Admirals Road	Approx. 25,000
Jedburgh Road		Approx. 300
Rudyard Road		Approx. 1000
Six-Mile Road		Approx. 11,000
Stormont Road		Approx. 1,000
View Royal Avenue		Approx. 1,000
Watkiss Way	Burnside Road West to Helmcken	Approx. 5,000
Watkiss Way / Highland Road		Approx. 5,000

These daily volumes highlight some of the vehicular traffic issues within the Town of View Royal. In particular the vehicular volumes on the Island Highway are consistent with those carried by arterial routes and provincial roads not routes within a small municipality. As major roads within the town, they are designated to have mobility as their primary function yet there are significant lands being accessed by this route, in particular along the section of the corridor between the Thetis interchange and Admirals Road.

Traffic volumes are important in assessing the role and function of a section of roadway and in determining a preferred cross section.

disaster routes

Disaster Response Routes form a network of pre-identified municipal and provincial roads that can best move emergency services and supplies to where they are needed in the event of a major disaster. They provide a critical resource for the Provincial Emergency Program as fire, police, ambulance, repair crews, emergency and life-saving equipment; services and supplies must move quickly to where the greatest need is, and mobility is the key. Road access from one area to another, from airports and ports, must be kept clear of non-essential vehicles and debris.

The Disaster Response Routes within the Town of View Royal, as illustrated in Exhibit 4 of Appendix B, in addition to the TCH, include:

- ◆ Island Highway between Shoreline School and Helmcken Road;
- ◆ Helmcken Road from Island Highway to Watkiss Way; and
- ◆ Watkiss Way from Helmcken Road to Talcott Road.



traffic accidents

The Town has already had two traffic safety and operation analyses studies done on the Admirals Road corridor as well as the Island Highway between Admirals Road and Burnside Road. They were conducted by CM2MHILL for the Insurance Corporation of BC (ICBC) and the Town of View Royal. The resulting recommendations contributed to the evaluation of these sections of the town's road network and their functional design as shown in Section 6.0. It is recommended that this same level of detailed analysis be applied to the other portions of the network within the Town, specifically the portion of the Island Highway from the Thetis interchange to the municipal border with the City of Colwood and Helmcken Road from the TCH interchange north to Burnside Road West.

To supplement the previous studies, the Westshore RCMP detachment provided two years of accident data for the period covering March 2005 to March 2007. From this data set, accident locations were mapped in order to establish high frequency accident locations and patterns.

Exhibit 5 in Appendix B provides a graphical representation of accident patterns within the Town during the above period. The size of the indicator labels illustrates the magnitude of the number of accidents that have occurred over the two years.

The groupings of accidents are consistent with the locations of the largest traffic volumes within the community and points of conflict which are the major movements at intersections. The intersections associated with the Helmcken Road/TCH interchange have the largest number of accidents while the other significant groupings are the intersections of Admirals Road/Island Highway, Island Highway/View Royal Avenue, Island Highway/Helmcken Road, Island Highway/Six Mile Road, Island Highway/Wilfert Road and Six Mile Road/TCH.

illumination



The existing illumination within the Town was inventoried as a part of this plan as it is an important part of the infrastructure to complement the use of alternative modes of transportation such as walking and cycling.

In general, the existing lighting consists of high level roadway lighting intended to serve motorists. However an example of improved illumination for alternative modes is the section of Helmcken Road between Island Highway and the TCH. It has been retrofitted with low level lighting which is more favorable to pedestrians and cyclists.

Refer to Exhibit 6 in Appendix B for an illustration showing the location, type, and frequency of street lights throughout the Town.

sidewalks

The current infrastructure for other modes of transportation was also inventoried and is shown in Exhibit 7 in Appendix B which depicts the existing bus stops and sidewalks differentiated by type.

The Pedestrian Plan and Sidewalk Condition Inventory Condition and Pedestrian Plan has been completed. The sidewalk network has been inventoried, its condition evaluated and entered into a database. The connectivity of this modal network to bus stop locations, trails and paths has been analyzed.

The trails network has been identified as part of the Parks and Trails Master Plan. Data on paths was collected in conjunction with the conduct of the Sidewalk Condition and Pedestrian Plan project. These trails and paths networks were considered in conjunction with the sidewalk inventory.

These modal networks have also been mapped in conjunction with major land uses to ascertain the amount and type of access being provided and the opportunities for modal transfers examined. The results of these analyses were used to determine what gaps exist in these modal networks and their priority. The recommendations for projects and their priorities will be presented to the Town at the same time as the Transportation Master Plan.

A broader based approach focusing on all modes of transportation is needed. It is critical that alternative modes continue to be promoted and implemented as viable alternatives to automobile-based solutions. The existing infrastructure of sidewalks, bicycle lanes, trails and paths need to be considered as part of a hierarchy for mobility and access. Any gaps in a modal network need to be filled and need to be integrated so that transfers between different modes are facilitated. Bus transit, commuter rail, and LRT should continue to be actively promoted and supported by the Town as a sustainable solution to regional transportation issues and lands for future rail transit corridors and stations need to be identified and protected.

It is critical that alternative modes continue to be promoted and implemented as viable alternatives to automobile-based solutions.

bicycle routes

The inventory of existing bicycle lanes and Regional trails is illustrated in Exhibit 8 of Appendix B. It should be noted that along with the E&N Rail Trail, both Island Highway and Helmcken Road have been identified as recommended bicycle routes of regional importance within the CRD Travel Choices Bicycle Strategy.



Figure 4 - Recommended Regional Cycling Network - 2002

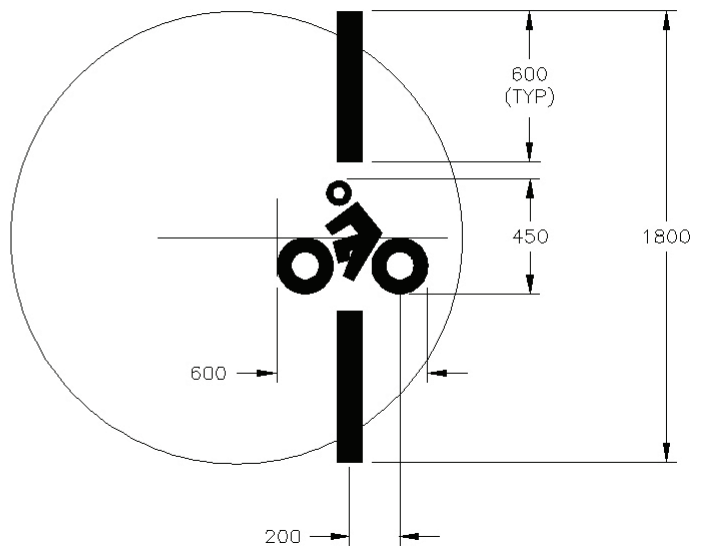


bicycle actuated signals



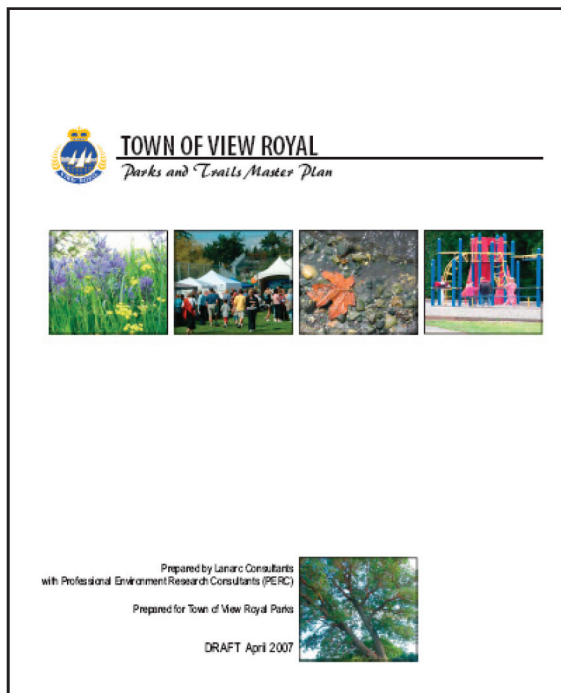
At an actuated intersection, the traffic signal does not automatically alternate between green indications on the main street and the local cross street. Instead, the signals will remain green on the main street until a vehicle or a pedestrian arrives at the cross street. The presence of a vehicle is detected on the cross street by a detector loop embedded in the pavement. The majority of detectors are not set at a sensitivity level to detect the presence of a bicycle. This forces cyclists to either wait for a motor vehicle to arrive in order to actuate the detector, or to dismount and depress the pedestrian push button.

It is recommended that adjustments be made to the sensitivity of the detectors at all actuated intersections to detect bicycles. Symbols should be applied to the roadway to inform cyclists where to place their bicycle to be detected by the sensor loop.



Cyclists can also activate push-buttons on cycling routes to either pre-empt existing signal phasing or activate a red phase to cross a route as is currently done at some locations on the regional trails.

trails / paths



A draft of the Town of View Royal's Parks and Trails Master Plan was completed in April 2007. It is a comprehensive inventory and review of the existing infrastructure and provides recommendations on future parks and trails systems in addition to an implementation strategy.

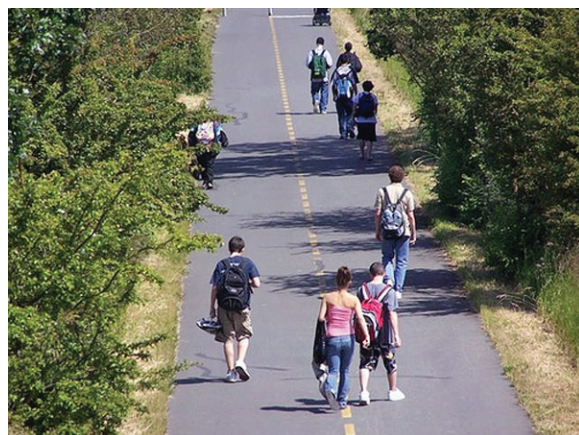
This work is key in terms of identifying a modal network and its utility in providing access to lands within and adjacent to the community. In conjunction with the inventories of the road, bicycle, sidewalk, and paths within the Town, the various facets of a transportation network are revealed. One of the challenges is how to make these various facets work together in the most effective and efficient manner.

galloping goose

The Galloping Goose Trail was constructed in the early 1920's as a rail corridor from Victoria to Leechtown where gold had been discovered during the gold rush days. It is approximately 55 kilometers long commencing at the Johnson Street Bridge and making its way through Victoria, Esquimalt, View Royal, Colwood, Langford, Metchosin, and Sooke.

The rails were removed from the route around 10 years ago as the corridor became part of the Rails to Trails program in the province of British Columbia. Dedicated in 1989, the Galloping Goose Trail became a part of the BC Trans Canada Trail system.

Under the jurisdiction of CRD Parks, the trail has developed into a popular commuter and recreational facility serving the entire region. Today, the Galloping Goose and Lochside trails experiences more than 800,000 users per year.



e & n rail trail



E&N Rail Trail - Nanaimo

The E&N Rail Trail project, targeted for completion in 2009, is an important element of transportation planning for View Royal. Like rail and roads, the new trail will serve local and regional traffic. Some of the corridor already sees informal use and the new trail is needed to respond to latent local and regional demand and to address safety issues.

The newly developed trail can be expected to convert some regional vehicular trips using View Royal roads to bike and walk trips. This is particularly likely for military families and base personnel that live on the west shore and work at Naden and Esquimalt. The trail will be a convenient and appealing route to and from work. Currently, more than 60% of base personnel live in west shore. It is estimated that already 10% bike to work. The new E&N Rail Trail will cut length from trip connections and may encourage new commuter cyclist activity.

Recreation use includes local destinations such as Thetis Lake and other parks in View Royal for use by local residents as well as other existing commuters. The new facility will help the Town in meeting Healthy Community goals.

- ◆ Trails and bike / walk facilities show at least 3 to 1 return on health costs alone;
- ◆ Will help meet ACT Now goals (BC active population programs); and
- ◆ Bicycle tourism links – good for the economy, benefits local View Royal business – 6 Mile and Four Mile pubs, alternate access to Admirals Walk, etc.

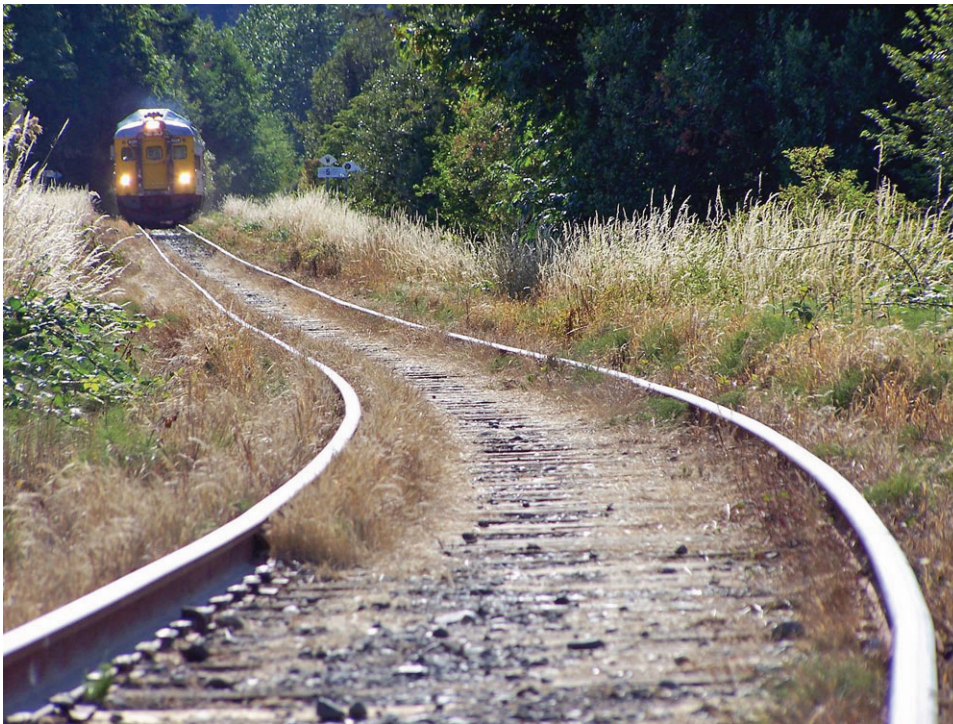
Important major projects for the trail, rail and road include;

- ◆ 4 Mile Hill overpass and ramp connections;
- ◆ Options for the Helmcken overpass;
- ◆ Ramp structures at Colwood exit bridges; and
- ◆ Trail links to parks, commercial destinations, schools, residential neighbourhoods, and new developments.

rails

Via Rail Canada currently operates a rail service on the E&N rail line using Rail Diesel Cars (RDC). Service is provided between downtown Victoria and Courtenay. The existing schedule is best suited to the tourism market, as the train departs Victoria at 8:00 AM daily, arriving in Courtenay at approximately 12:30 PM. The train returns to Victoria, departing Courtenay at 1:00 PM and arriving at 5:30 PM.

Advocates for the use of this rail service as a commuter rail service from the Cowichan Valley Regional District to downtown Victoria have been actively pursuing this idea for several years. One-way trial runs have been conducted, which saw a Langford departure arriving in Victoria prior to the trains' 8:00 AM Courtenay trip.



The basic Budd RDC is 26 metres in length but can be configured in a variety of ways. The all-passenger coach configuration has a capacity of 90 people while the baggage and passenger coach configuration has seating for 70 passengers. Assuming the all-passenger configuration for commuter service with an average vehicular occupancy of 1.1 people, it means each Budd car has the potential to take approximately 80 vehicles off the road network during the peak commuter period.

4.5 public input

open houses

Two public information meetings were hosted by the Town over the course of the study to solicit input on transportation issues and concerns and to present key findings of the study. The recommended Transportation Master Plan and the process used to define the plan reflect a consensus of these participants.

The first Open House, held on June 22, 2006 from 4:00 to 8:30 pm, was conducted to solicit input from businesses and residents on the desired form of the roadways within the Town.

Questionnaires were distributed and filled out by attendees and were in turn used by the project team to ascertain the community's current issues and the direction they would like to see the transportation network evolve into the foreseeable future.

A second Open House was held on March 29, 2007 from 4:00 to 8:30 pm in order to display concepts for the roadway improvements and to again solicit input from residents on the form of the design options. It was at this time the community saw preliminary design concept drawings which characterized the recommended road improvements and overall form. Again, questionnaires were distributed and filled out by attendees to solicit feedback with respect to the overall strategies presented.

Sample Public Comment Sheets are contained in Appendix C.

transportation advisory committee

The Town's Transportation Advisory Committee (TAC), was a valued contributor during the consultation process. The committee met with the consulting team and Town staff at key junctures to provide additional information and insights as well as providing a forum for issues. Any community concerns were articulated and explored. TAC also provided members to participate in a workshop for the evaluation and ranking of candidate projects for pedestrian, bicycling and vehicular traffic improvement projects.

stakeholder input

The Transportation Master Plan reflects a collective effort among individuals representing various public and private interests in the region including the Town of View Royal, Esquimalt Nation, Songhees Nation, Ministry of Transportation, Capital Regional District, ICBC, District of Saanich, Township of Esquimalt, City of Colwood, City of Langford, BC Transit, and Emergency Services. These agencies and interests were initially organized into two committees (Technical and Government) that met at four key stages in the planning process.

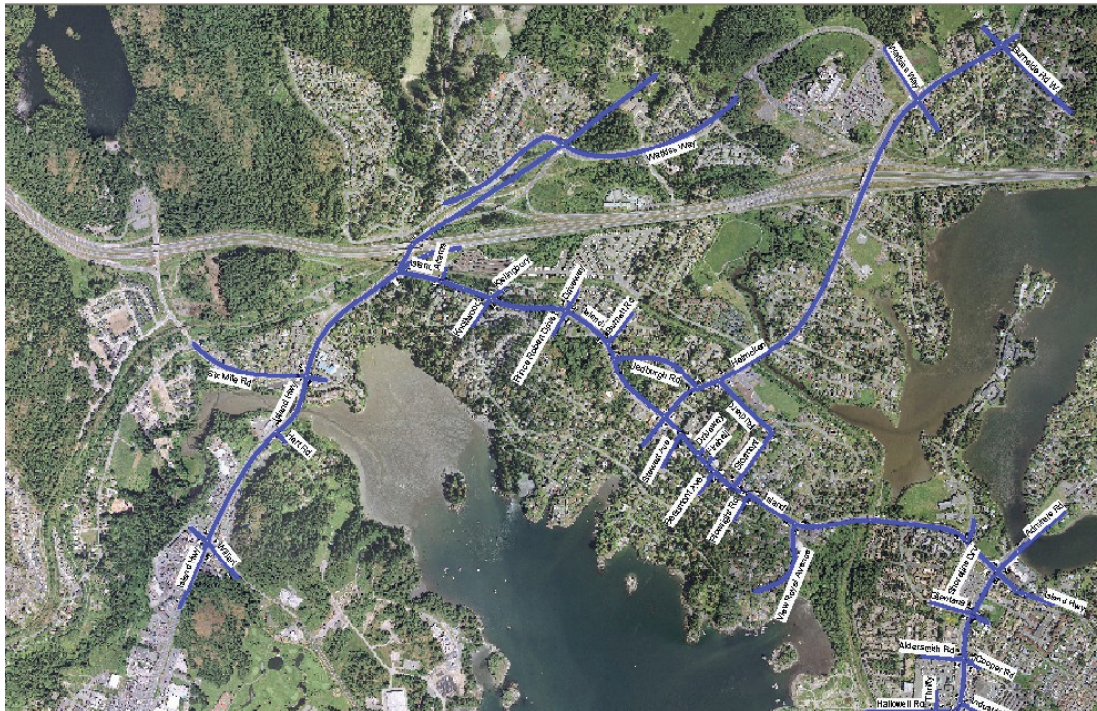
Ambulance Service:	David Valentine
BC Transit:	Mike Davis
Capital Regional District:	Larry Roberts, Malcolm McPhail
City of Colwood:	John Sansom - Michael Baxter
City of Langford:	Michael Baxter, Connie Nicolletti, Kamrin Mirza
City of Victoria:	Tim Galavan, Brad Dellebuur
Department of National Defense:	Dave Trabbernor – Lt. Todd Bradford
District of Saanich:	Mike Lai
Esquimalt Nation:	Andy Thomas, Joan Brown, Bob Mason
Greater Victoria Cycling Coalition:	Darren Marr, President
Insurance Corporation of BC:	Alison Wong, Julian Rozenhal
Ministry of Transportation:	Sean O'Sullivan, Janelle Yardley
Songhees Nation:	Gary Albany, Cheryl Brice
Town of View Royal Fire Dept:	Paul Hurst
Township of Esquimalt:	Norm Pugh, Darryl Woodley
Transportation Advisory Committee:	Julie Higginson
Westshore RCMP:	Jim Faulkner

Some representatives were unable to attend the formal meetings. Every effort was made to contact and consult with these representatives on an individual basis.

5

Along with the roadway analysis, the work plan for this study also incorporated the analysis of infrastructure related to alternative modes of transportation within the road right-of-way and the findings are found in this section.

5.1



Synchro Image

A systematic approach was taken to evaluate the traffic conditions within the study area. Traffic count and signal timing data for the study area intersections was collected and analyzed. The traffic study focused on weekday AM and PM peak hour traffic flows in determining roadway capacity, operating level of service, and the degree of impact by any future development.

The traffic analysis adhered to the following procedure:

- ◇ Review the roadway geometrics within the study area;
- ◇ Determine the existing traffic volumes within the study area;
- ◇ Create microsimulation models of the existing AM and PM peak hour volumes using Synchro/SimTraffic.



SimTraffic Image

The computer software

package (Synchro / SimTraffic) was selected by the Town for the roadway analysis due to its capability of analyzing roadway intersections as a system. The Synchro portion of the software uses the Highway Capacity Manual's standardized analysis methodology and formulas to calculate the performance of each of the intersections in the model. The SimTraffic software uses the data in the analysis package and applies random variables to emulate a range of driver behaviour characteristics. This enables the software to animate the traffic in a realistic manner indicating the overall interaction between intersections;



- ◇ Document the performance measures of the existing traffic flows on the routes identified in the study area. This includes level of service (LOS) calculations for the pertinent intersections in order to determine the current operating efficiency of the street system;
- ◇ Determine and address any capacity and/or safety issues; and
- ◇ Assess scenarios of full development of the Town under the current OCP and land-use bylaws.

information gathered

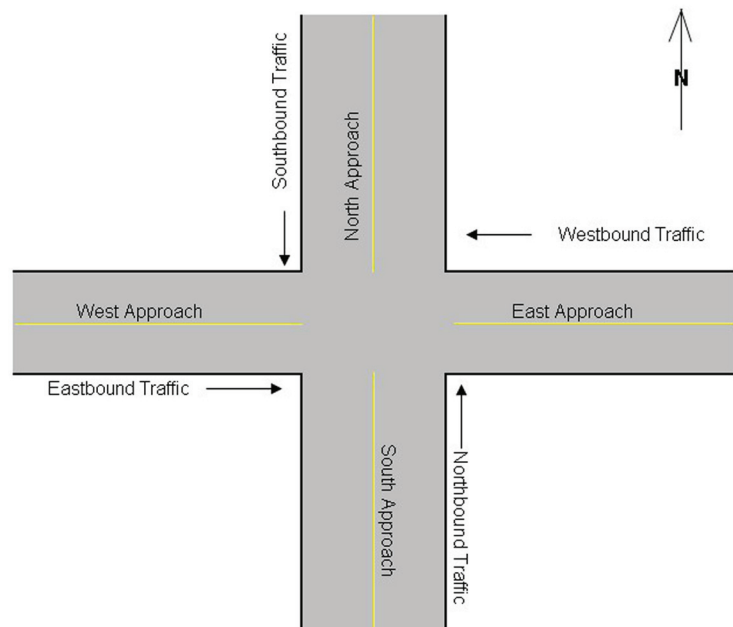
The following traffic data was collected in order to gain a complete understanding of the existing traffic flows within the study area:

- ◇ Scaled 2005 aerial photography of the Town;
- ◇ Digital contour mapping of the Town;
- ◇ Survey data consisting of existing property boundaries;
- ◇ Existing traffic signal timing plans for each signalized intersection;
- ◇ Traffic counts were obtained from the Town which was from traffic controller download data. These counts were supplemented by manual traffic counts where turning movements were not available from the traffic controller download data; and
- ◇ Supplemental peak hour counts of pedestrian and cyclist volumes at each signalized intersection were also obtained.

existing geometrics

The existing laning and roadway geometrics were coded into the Synchro traffic model for analysis. The 2005 Town aerial photography was used as a starting point for the model construction and a scaled background image was imported into the software so that intersection locations and spacing could be accurately depicted. The intersection geometrics such as left turn storage lengths were measured from the image and grades were measured from a digital topographical map of the Town. A thorough field reconnaissance was undertaken to confirm the measured geometrics.

For the purpose of referencing direction within this report, the following graphic depicts the directional attributes when referring to intersection geometry.





model calibration

Once all the data was entered and the Synchro models were complete for existing conditions, the SimTraffic microsimulation was run to assess its representation of traffic operations. Minor adjustments were made to the model to reflect driver behavior observed in the field.

intersection performance

A qualitative rating of the effectiveness of a signalized intersection is measured in terms of operating conditions, commonly referred to as a 'Level of Service' (LOS).

The Highway Capacity Manual identifies operating conditions ranging from LOS A to F, briefly described below for signalized intersections:

LOS A	Excellent traffic flow, favorable progression, most vehicles do not stop at all.
LOS B	Very good traffic flow, short delays, more vehicles stop than under LOS A causing higher levels of delay.
LOS C	Traffic flow is still good, but the number of vehicles stopping is significant. Many vehicles still proceed without stopping.
LOS D	The influence of congestion becomes noticeable. Few vehicles advance through the intersection without stopping.
LOS E	Virtually no vehicles proceed without stopping. This is the limit of acceptable delay for many agencies.
LOS F	Traffic volume exceeds available capacity. All vehicles must stop at least once, and possibly must wait through several signal cycles before proceeding.

A more detailed description can be found in Appendix D.

5.2 existing conditions

The following Table 3 lists the overall level of service of the signalized intersections within the study area for existing conditions. The current traffic volumes and signal timings were used to establish a base case of levels of performance for the current year, to be compared to future conditions analyzed for various growth scenarios.

Table 3 - Existing Intersections Peak Hours Level of Service

Existing Conditions - Peak Hour Intersection LOS		
Signalized Intersection Location	AM	PM
Island Highway / Wilfert Road	B	B
Island Highway / Six-Mile Road	D	C
Island Highway / Burnside Road West	B	C
Island Highway / Knollwood / Kislingbury	B	A
Island Highway / Helmcken Road	E	F
Island Highway / Stormont	E	D
Island Highway / Admirals Road	C	C
Admirals Road / Glentana Road	A	C
Admirals Road / Hallowell Road	A	B
Helmcken Road / Watkiss Way	B	B
Helmcken Road / Burnside Road West	C	F

The values in the table reflect the weighted average of delay at each intersection. Individual movements have varying measures of delay. A sample of the detailed assessment of each signalized intersection can be found in Appendix E.

Given the location of the Town of View Royal in a regional context and the role of Island Highway as a commuter route between the Westshore, DND, and the Downtown Victoria business district, it must be recognized that without significant upgrades to deal with commuter traffic congestion along the TCH, Island Highway will continue to be subject to diverted traffic attempting to avoiding the extensive delay on that corridor.



The AM peak hour was established as occurring from 7:30AM to 8:30AM and the PM peak hour from 4:15PM to 5:15PM. As seen in the above table, most intersections operate at an acceptable level of service during this period. Areas which displayed extensive queuing and delay are:

Island Highway at Wilfert Road

During the AM Peak Period, this intersection experiences significant queuing in the northbound direction. While vehicle delay is considered acceptable, due to the downhill grade, cyclist speed in this direction can exceed that of the vehicular traffic which can cause vehicle-bicycle conflicts at access points to adjacent commercial developments. Similarly, the grade at this intersection contributes to the number of rear-end collisions in the northbound direction.

Island Highway at Hart Road

This intersection is currently unsignalized which makes southbound and westbound left turns difficult during peak traffic conditions. There is also no provision here for pedestrian traffic wishing to cross Island Highway. With anticipated increases to vehicular and pedestrian volumes associated with new development on this road, current plans to signalize this intersection will improve safety for all modes.



Island Highway at Six Mile Road

All individual movements operate at acceptable levels with the exception of eastbound left turning traffic from Six Mile Road onto Island Highway. This particular movement operates at a LOS F. This condition is due to the heavy conflicting traffic volumes on Island Highway. The majority of green time is given to Island Highway traffic as it is the major arterial with the highest traffic volumes. Pedestrian traffic crossing the Island Highway on the north leg of the intersection is in conflict with left turning automobiles from Six Mile Road. This interrupts the flow for this movement and creates additional delay and safety concerns.

Northbound traffic operates at a LOS D. While this indicates an acceptable level of delay, it should be noted that during this period queues extending to the south frequently interfere with access to and from Hart Road.

This intersection is currently being upgraded to improve capacity for eastbound left turning traffic from Six Mile Road. This is intended to reduce vehicle queuing and delay during peak periods in this direction. The design will also see the elimination of the pedestrian crosswalk on the north approach of the intersection which will inherently reduce pedestrian conflicts here. With the new intersection design, westbound through and left turning traffic exiting 485 Island Highway will be further impeded by the eastbound left traffic and will subsequently require a designated signal phase for safe egress.

Island Highway at Burnside Road

While this intersection works well from a traffic operations perspective, the pedestrian crosswalk on the eastbound Island Highway lane would be made safer, particularly in the evening if it were relocated slightly west of its current location, directly under the existing luminaire. Sight distance would also be improved for approaching traffic that must stop for pedestrians.

Island Highway at Kislingbury Lane / Knollwood Road

The vertical and horizontal grade on the Island Highway east approach to the intersection contributes to stopping sight distance issues which have been addressed with the implementation of advance warning flashers. Poor cross alignment of the Kislingbury Lane leg at this intersection also present safety issues for left turn and through traffic from the north and south approaches. Drivers exiting Kislingbury Lane also have their sight distance impeded by a rock outcrop on the northeast section of Island Highway. In the short term, it is recommended that this rock be removed.



Kislingbury Lane will become an important connection to the new E&N Rail Trail and will likely experience increased vehicle, pedestrian and bike traffic. This location is a natural trailhead location and should be improved to accommodate all modes of this additional traffic. A new alignment of this intersection approach is recommended in this study. Provision should be made for bicycles and pedestrian traffic in the form of road markings for bike traffic and a sidewalk on the west side of the road.

Island Highway between Knollwood / Kislingbury and Helmcken Road

Sections of Island Highway were constructed with a negative cross slope (super elevation) through horizontal curves. This condition creates a lack of centrifugal force being applied to vehicles negotiating these curves at higher speeds which contributes to the possibility of these vehicles leaving the roadway. This condition is exacerbated when the road surface is wet. A new roadway alignment is being recommended in this report to address this issue.

Island Highway at Burnett Road

Left turning traffic onto Island Highway encounters extensive eastbound queues during the AM Peak Period. Observations at this unsignalized intersection determined that these vehicles are able to exit into the roadway and find refuge in the painted median area before merging into the rolling queue. Driver courtesy is required for this merging which did not appear to be an issue.

While pedestrian activity was low at this location, a pedestrian activated signal is within 100m for crossing of Island Highway.

Traffic and pedestrian volumes at this intersection should be monitored regularly. A traffic signal warrant analysis should also be performed as volumes increase. The spacing of this intersection along this road section is appropriate should signalization become warranted in the future.

Island Highway at Helmcken Road

This intersection is under pressure during the AM peak period as a significant volume of traffic from Helmcken Road converges with the through traffic on Island Highway. At this point, significant queues develop on Helmcken Road and Island Highway. Eastbound Island Highway traffic is observed to queue back to the diverge lane near the Thetis overpass, occasionally spilling beyond the auxiliary lane.

Negative grades on the Helmcken Road south approach and Island Highway east approach can contribute to rear-end collisions. Another factor is the conflicting pedestrian volumes crossing the east approach of Island Highway, particularly during the AM Peak Period, where vehicles may have to stop unexpectedly for pedestrians. The existing vehicle delay experienced for southbound left and eastbound through traffic during the AM peak period tends to contribute to driver frustration and drivers will attempt to progress through the intersection during the amber signal phase.



While exclusive left turn lanes are available at each intersection approach, drivers can find it challenging performing these movements onto Helmcken Road from Island Highway during peak periods. An advanced left turn signal phase is operational for eastbound traffic during the PM Peak Period. No advance left turn signal phase is available for westbound left turning traffic during the AM Peak Period. During this study, a detailed analysis was conducted to determine the feasibility of providing an exclusive

signal phase for this movement. It was determined that under present conditions, an allocation of green time to this movement would create additional delay to eastbound through traffic which would lengthen queues on Island Highway which periodically extend beyond the eastbound right turn storage lane near the Thetis Overpass and block through traffic onto Highway 1. With low traffic demand for this movement, drivers were observed to clear the intersection during the clearance (amber) phase which is an appropriate manoeuvre. Anti-skid road surface treatment is recommended at the intersection approaches.

The westbound through movement volumes exceed capacity during the PM peak hour. Similarly, the southbound shared through / left turn exceeds capacity as the majority of green time is allocated to Island Highway through traffic. It should also be noted that the section of Island Highway approaching Helmcken Road between View Royal Avenue and Helmcken Road does not have any laning provision for left turning traffic. On several occasions, left turning traffic from Island Highway was observed blocking through traffic while waiting for gaps in opposing traffic. This not only contributes to rear-end collisions, but jeopardizes the safety of bike and pedestrian traffic as through drivers tend to pass on the shoulders. Dedicated left turn lanes are recommended along this section of roadway.

Island Highway at Stormont Road

This intersection serves as an important access point for the residential developments within the Glenairlie Drive neighbourhood. Currently there is no provision by way of signal phasing or laning for eastbound left turning vehicles into the neighbourhood.

During the AM peak period, the eastbound traffic movement operates at a LOS F. The lack of facility for eastbound left turning traffic contributes to the delay here as left turning vehicles block through traffic. Through vehicle drivers were observed passing the stopped vehicle on the roadway shoulders, potentially conflicting with bike and pedestrian traffic. A separate left turn lane and associated advance signal phase for this movement is recommended.

It was also observed that some vehicles in the queue on Helmcken Road divert to Rudyard Road and then to Stormont Road in an attempt to short-cut around the Island Highway / Helmcken Road intersection. This action causes the signal at Island Highway / Stormont Road to be actuated more often by Stormont Road traffic, causing Island Highway traffic to stop.

Island Highway at Admirals Road

The eastbound traffic approaching the intersection has a protected left / through signal phase. This phase is provided as a safety measure due to the high left turning traffic volumes and lack of right-of-way to achieve an exclusive left turn lane. Left turning vehicles clear from the queue during this phase during both the AM and PM periods. At this intersection during the AM Peak Period, approximately 30% of the approaching volume turns right onto Admirals Road toward DND.

During the PM peak period technical performance measures at this intersection show an overall LOS C although significant operational deficiencies are experienced. While ample capacity is built into the intersection design, the reduction from two travel lanes to one in the westbound direction contributes to delay due to the merge conflict. Drivers in the curb lane approaching Shoreline Drive tend to manoeuvre into the through lane immediately beyond Admirals Road which contributes to vehicles being trapped in the intersection. The right turn 'drop' lane approaching Shoreline Drive is often under utilized exacerbating this condition.



Helmcken Road at Burnside Road West

During the AM peak period, northbound queues here extend back to Watkiss Way at times. This is due in part to the combination of significant left turn volumes from Watkiss Way combined with the reduction in travel lanes from two to one in the northbound direction just beyond Watkiss Way.

The heavy demand for left turns from Burnside Road West contributes to southbound delay at this intersection. As with Helmcken Road, Burnside Road West experiences significant traffic volumes as a result of the significant congestion on the TCH. Drivers trying to avoid the congestion at McKenzie Avenue / TCH use this route in an attempt to bypass intersection.

Burnside Road West at Watkiss Way

This intersection currently operates with four way stop control. It has a single lane approaches at each intersection leg with the exception of the south leg which is comprised of two through lanes which are shared with left and right turning traffic. The design of this intersection includes large corner radii which expand the cross-section of the intersection. One pedestrian crossing is marked on the south approach which serves significant pedestrian and cyclist traffic utilizing the Galloping Goose Regional Trail.

Coinciding with the two northbound through lanes, a second receiving lane exists on the north leg of the intersection. Observations showed that some through drivers would use the curb lane to 'jump' ahead of queued traffic causing an unsafe environment for pedestrians and cyclists.

Burnside Road West east of Helmcken Road

Although this section of roadway is classified as a major road, its cross-section is quite narrow and does not have any provision for bicycle traffic. There is an asphalt sidewalk on the south side of the road only. As mentioned previously, this road section experiences additional traffic volumes due to the congestion experienced on the TCH during both the AM and PM peak periods. Speeding traffic has been identified as an issue by local residents and traffic calming measures should be explored.



5.3 future conditions - external development

For the analysis of future conditions, the existing conditions were projected for the two Horizon Years of 2015 and 2026, corresponding to the Rapid and Slow Growth scenarios, but without any internal development. This gives an indication of how the road network would likely operate in the future with only external development in neighbouring communities considered.

horizon year 2015

In an attempt to account for external growth, a 1.5% per annum traffic volume increase was applied in the traffic model. Over the nine year horizon, this equates to a 14% increase in traffic volumes by 2015. For the purpose of this analysis, improvements to the roadway as described in the following Section 6 were applied to the traffic models.

The following Table 4 gives an indication of overall intersection performance for the peak periods;

Table 4 - *Future Background Traffic Intersection Performance - 2015*

Horizon Year 2015 Conditions - Peak Hour Intersection LOS		
Signalized Intersection Location	AM Peak	PM Peak
Island Highway / Wilfert Road	D	B
Island Highway / Hart Road	C	A
Island Highway / Six-Mile Road	D	C
Island Highway / Burnside Road West	B	C
Island Highway / Knollwood / Kislingbury	B	A
Island Highway / Helmcken Road	F	F
Island Highway / Stormont	F	C
Island Highway / Admirals Road	D	C
Admirals Road / Glentana Road	A	A
Admirals Road / Aldersmith Road	A	B
Admirals Road / Hallowell Road	A	B
Helmcken Road / Watkiss Way	C	B
Helmcken Road / Burnside Road West	F	D

As seen in the above table, overall, most intersections operate at an acceptable level of service during this period. Areas which displayed extensive queuing and delay are:

Island Highway at Wilfert Road

During the AM peak period, traffic volumes at this intersection will exceed capacity in the northbound direction which will operate at a LOS F for this movement. Queuing in the northbound direction can be expected to increase in length from approximately 300m existing to 450m.

The PM peak hour can be expected to see traffic volumes approaching capacity in the southbound direction however the overall intersection performance will operate satisfactorily.

Six Mile Road at Island Highway

During the AM peak period, traffic volumes at this intersection will exceed capacity in the northbound direction which will operate at a LOS E for this movement. Eastbound left Six Mile Road traffic volumes will be nearing capacity and operating at a LOS E. The PM peak hour can be expected to see traffic volumes approaching capacity in the southbound direction however, the overall intersection performance will operate satisfactorily.

Island Highway at Helmcken Road

During the AM peak period, projected volumes at this intersection will exceed capacity in all but the northbound directions while during the PM peak period, projected volumes at this intersection will exceed capacity in both the westbound and southbound directions.

Island Highway at Stormont Road

During the AM peak period, traffic volumes at this intersection will exceed capacity in the eastbound direction which will operate at a LOS F for this movement. During the PM peak period, traffic volumes at this intersection will reach or exceed capacity in the westbound direction and lengthy queues will be present for this movement.

Island Highway at Admirals Road

During the AM peak period, traffic volumes at this intersection will exceed capacity in the eastbound direction which will operate at a LOS F for this movement. During the PM peak period, performance indicators suggest this intersection will operate within capacity thresholds with an overall LOS C. The extension of the second westbound travel lane beyond Shoreline Drive contributes to more efficient operation here.

Helmcken at Burnside Road West

During the AM peak period, traffic volumes at this intersection will exceed capacity in both the westbound and northbound directions which will operate at a LOS F for these movements. PM peak period traffic volumes at this intersection are expected to exceed capacity in both the westbound and southbound directions however the overall intersection performance is adequate with LOS D.

Burnside Road West at Watkiss Way

AM peak hour volumes in the northbound direction are expected to exceed capacity and this movement is anticipated to operate at a LOS F. Signalization of this intersection will be required by Horizon Year 2015. It should be noted that planned development adjacent to this intersection will hasten this requirement.

During the PM peak period, this intersection operates efficiently as a four-way stop control. Safe crossing of pedestrian and cycling traffic on the Galloping Goose is enhanced with signalization.

horizon year 2026

As with the horizon year 2015, a 1.5% per annum traffic volume increase was applied in the traffic model. Over the twenty years of assumed growth from 2007 to 2026, this equates to a 35% increase in traffic volumes by 2026.

The following Table 5 gives an indication of overall intersection performance for the peak periods;

Table 5 - *Future Background Traffic Intersection Performance - 2026*

Horizon Year 2026 Conditions - Peak Hour Intersection LOS		
Signalized Intersection Location	AM Peak	PM Peak
Island Highway / Wilfert Road	E	E
Island Highway / Hart Road	D	B
Island Highway / Six-Mile Road	E	F
Island Highway / Burnside Road West	B	D
Island Highway / Knollwood / Kislingbury	B	A
Island Highway / Helmcken Road	F	F
Island Highway / Stormont	F	E
Island Highway / Admirals Road	E	E
Admirals Road / Glentana Road	A	B
Admirals Road / Aldersmith Road	A	C
Admirals Road / Hallowell Road	A	D
Helmcken Road / Watkiss Way	C	B
Helmcken Road / Burnside Road West	F	F

Locations where there was extensive queuing and delay are as follows:

Island Highway at Wilfert Road

During the AM peak period, traffic volumes at this intersection will exceed capacity in the northbound direction and the overall intersection LOS is expected to further degrade. The PM peak hour can now be expected to see traffic volumes exceeding capacity in the southbound direction with extensive associated queuing in this direction. Traffic exiting Wilfert Road to travel north on Island Highway will also experience considerable delay at this time.

Island Highway at Hart Road

During the AM peak period, traffic volumes at this intersection will exceed capacity in the northbound direction. While the overall intersection LOS is expected to be at a level D, the LOS for this movement would likely be at a level E. The PM peak hour can be expected to see traffic volumes nearing capacity in the southbound direction however, the overall intersection performance will operate satisfactorily.

Six Mile Road at Island Highway

During the AM peak period, traffic volumes at this intersection will exceed capacity in the northbound direction which will operate at a LOS F for this movement. Eastbound left Six Mile Road traffic volumes will be nearing capacity and operating at a LOS E. The PM peak hour can be expected to see traffic volumes exceeding capacity in the southbound direction and the overall intersection performance will operate at a LOS E.

Island Highway at Burnside Road

During the AM peak period no traffic related issues are present. The PM peak hour can be expected to see traffic volumes exceeding capacity in the southbound and westbound directions and the overall intersection performance will operate at a LOS D.

Island Highway at Helmcken Road

During the AM peak period, projected volumes at this intersection will far exceed capacity in all but the northbound directions while during the PM peak period, projected volumes at this intersection will far exceed capacity in both the westbound and southbound directions.

Island Highway at Stormont Road

During the AM peak period, traffic volumes at this intersection will exceed capacity in the eastbound direction which will continue to operate at a LOS F for this movement. The PM peak period traffic volumes at this intersection will exceed capacity in the westbound direction and lengthy queues will be present for this movement.

Island Highway at Admirals Road

During the AM peak period, traffic volumes at this intersection will exceed capacity in the eastbound direction which will operate at a LOS F for this movement. Southbound left turn movement is also shown to operate at a LOS F by this time. PM peak period performance indicators suggest this intersection will exceed capacity thresholds.

Helmcken Road at Watkiss Way

During the AM peak period, intersection performance measurements indicate satisfactory operation overall, however northbound queues from the Helmcken Road / Burnside Road intersection will extend south to this intersection which will affect throughput.

Helmcken Road at Burnside Road West

During the AM peak period, traffic volumes at this intersection will further exceed capacity in both the westbound and northbound directions which will continue to operate at a LOS F for these movements. PM peak period traffic volumes at this intersection are expected to exceed capacity in both the westbound and southbound directions however the overall intersection performance is adequate with LOS D.

Burnside Road West at Watkiss Way

AM peak hour Volumes in the northbound direction are expected to exceed capacity and this movement is anticipated to operate at a LOS F. Signalization of this intersection was implemented in the traffic model with a resultant intersection LOS A.

During the PM peak period, this intersection operates efficiently as a four-way stop control. Safe crossing of pedestrian and cycling traffic on the Galloping Goose is enhanced with signalization.



5.4 future conditions - internal development

In addition to the anticipated growth in neighbouring communities that was analyzed in the previous section, there is potential for significant development within the Town as evident in the Town's OCP and Land Use bylaws. In order to examine the potential impact of this development, the maximum densities of the land use bylaw and OCP were analyzed and analyzed for a Rapid Growth Scenario which would see all of this development occur by Internal development horizon Year 2015 and a Slow Growth Scenario which would see full build out in Horizon Year 2026. The methodology utilized for this analysis is described in the following sections.

trip generation



The various land use classifications were determined for each of the CRD Traffic Zones associated with regional EMME2 traffic model, as seen in Exhibit 9 in Appendix B. For each of the land uses, trip generation rates were taken from the Institute of Transportation Engineers Trip Generation Manual, 7th Edition. The rates most accurately describing the potential land-uses within development areas were chosen.

The Peak Hour Trip Generation Calculations illustrate the trip generation for the proposed buildout for both the AM and PM peak hours and reflects maximum densities associated with the OCP (Refer to Appendix F). For the purpose of this study, no trip reductions related to TDM or Alternative Mode shifts have been applied in order to:

- ◆ Estimate the total daily and peak hour traffic generated by future re-development;
- ◆ Project the distribution (ie. Origins and destinations) of the vehicle trips generated by the new development; and
- ◆ Assign these new trips onto the adjacent street system within the study area.

The following Table 6 summarizes the additional vehicle trips that can be anticipated under the current zoning bylaw during peak periods.

Table 6 - Additional traffic generated under full build-out scenario

Projected New Trips					
Traffic Zone	AM			PM	
	IN	OUT		IN	OUT
2890	15	44		50	29
5510	118	125		147	135
5520	71	220		231	145
5530	730	139		366	750
5540	115	54		64	108
5550	43	91		121	86
5560	214	143		443	501
5570	8	25		28	16
5580	36	80		115	60
5590	42	45		124	110
5600	48	58		145	139
5610	53	63		157	150
5620	4	16		14	8
5630	1	3		3	2

trip assignment

The CRD traffic zones, as seen in Exhibit 9 in Appendix B, the assignment of potential future trips onto the surrounding road system was done utilizing distribution reported from the 2003 CRD household origin / destination survey. A matrix was developed from this data which indicates the percentage of trips originating within specific zones and the communities within the region that these trips are destined as shown in the following Table 7.

Table 7 - CRD Origin Destination Matrix

2003 CRD Household Origin / Destination Survey Results														
	Sidney	North Saanich	Central Saanich	Saanich	Oak Bay	Victoria	Esquimalt	View Royal	Highlands	Colwood	Langford	Metchosin	Sooke	
Sidney	44%	23%	14%	11%	1%	4%	1%	1%	0%	1%	1%	0%	0%	100%
North Saanich	24%	35%	17%	13%	1%	5%	1%	1%	0%	1%	1%	0%	0%	100%
Central Saanich	9%	10%	34%	27%	1%	9%	2%	2%	1%	2%	3%	1%	1%	100%
Saanich	1%	1%	4%	50%	5%	24%	4%	3%	0%	2%	4%	1%	1%	100%
Oak Bay	0%	0%	1%	31%	18%	40%	4%	2%	0%	1%	2%	0%	0%	100%
Victoria	1%	1%	1%	28%	7%	50%	5%	2%	0%	2%	3%	1%	1%	100%
Esquimalt	1%	1%	2%	31%	4%	30%	16%	6%	1%	3%	5%	1%	1%	100%
View Royal	1%	1%	3%	34%	3%	20%	9%	11%	1%	7%	10%	1%	1%	100%
Highlands	1%	1%	5%	24%	1%	10%	3%	6%	16%	7%	22%	2%	2%	100%
Colwood	0%	0%	1%	14%	1%	7%	2%	4%	1%	32%	27%	7%	3%	100%
Langford	0%	0%	1%	14%	1%	7%	2%	4%	2%	19%	40%	5%	4%	100%
Metchosin	0%	0%	1%	7%	0%	4%	1%	2%	0%	17%	18%	36%	12%	100%
Sooke	0%	0%	0%	1%	0%	1%	0%	0%	0%	3%	4%	5%	84%	100%

Given this information, logical routings of these trips were established and projected in the traffic models.

The additional traffic volumes which were calculated for each traffic zone and the anticipated origins / destinations can be found in Appendix F.

development driven improvements

It is understood that development traffic generated in adjacent municipalities will quickly consume any roadway capacity within the town. The focus of roadway improvements attributed to internal development are directed toward safety and convenience for all transportation modes.

In order to determine requirements for municipal roadway improvements related to future internal development, each traffic zone was analyzed individually with respect to anticipated new traffic. This exercise provides an understanding of the local impact of development and a basis to establish Development Cost Charges for the land-uses that may be developed.

For the resultant number of peak hour vehicle trips related to build-out of individual zones, refer to Appendix F.

Traffic Zone 2890

This zone encompasses the portion of the 'Helmcken' Local Planning Area bounded by Island Highway to the south, TCH to the north, Helmcken Road to the west and Portage Inlet to the east. With limited ability under the current OCP land-use bylaw for densification here, the estimated number of new vehicle trips associated to full build-out of this zone is less than significant when dispersed onto the surrounding road network.

No attributable mitigation measures are identified, however traffic calming is recommended on all local roads to improve conditions for pedestrians and cyclists.

Traffic Zone 5510

This traffic zone encompasses the 'Thetis' Local Planning Area. The area is comprised mainly of Regional parkland with the exception of a portion adjacent the access to Thetis Lake Park which is zoned C-6 (tourist commercial). Under the current zoning, new trips associated with full build-out of this area would likely contribute to increased delay at the Atkins Road / Six Mile Rd intersection as well as the Six Mile Road / Island Highway intersections.

A separate northbound left turn lane onto West Park Lane would be required under a build-out scenario. This impact of this new traffic would be mitigated further by the provision of bike lanes and sidewalks on Six Mile Road in its entirety.

Traffic Zone 5520

This traffic zone covers the 'Atkins' Local Planning Area. A significant amount of new traffic would be associated with full build-out within this zone.

In order to mitigate the impact of full build-out of this zone, a new intersection configuration would be necessary at the intersection of Six Mile Rd. / Atkins Road. It is anticipated that the planned 'roundabout' at this location would effectively manage this new traffic.

Enhanced pedestrian facilities along Atkins Road and neighbourhood links to the Galloping Goose Regional Trail would be prudent.

Traffic Zone 5530

This is the section of the Wilfert Local Planning Area that is the west of the Island Highway. This commercial land use has potential for significant densification and associated traffic generation.

Mitigation measures attributed to this build-out scenario are related to access management. Under the current design of the Hart Road intersection, provision is made for the alignment of a new access into this development area. If possible, a parallel internal access road should be constructed which would connect to Wilfert Road. All access to development would be via this parallel road. Further to this, a connection of Wilfert Road to Wale Road, within the City of Colwood should be considered.

Traffic Zone 5540

This is the section of the Wilfert Local Planning Area that is to the east of the Island Highway. Along with a modest amount of residential development, the current C-7 zoning in this traffic zone allows for a significant amount of commercial development.

The new traffic attributed to full build-out within this zone will be mitigated with the implementation of the new traffic signal and laning at the Hart Road / Island Highway intersection.

Traffic Zone 5550

This portion of the Burnside Local Planning Area has potential for a mix of residential and commercial development. Combined with the adjacent development of a golf course within the District of Saanich abutting this zone, traffic generated in this area will require mitigation in the form of improvements to the Watkiss Way / Burnside Road West intersection. Due to the potential for an accelerated pace of development in this area, a traffic signal warrant analysis was conducted to determine the impact of these 'known' development scenarios. It was established through this analysis that a new intersection control will be warranted with the development of the subject parcels.

A new laning and intersection control concept design has been performed for the intersection and is reflected in the concept plans found within this report. The concept also recommends improvements to pedestrian and bike facilities along Watkiss Way and identifies parking provisions related to new parkland and school activity for the adjacent Eagle View Elementary School.

Traffic Zone 5560

This traffic zone falls within the 'Hospital' Local Planning Area to the west of Helmcken Road. The density associated with the current C-1 zoning within this area would traditionally contribute a 'more than significant' number of vehicle trips on the adjacent road system. Access to this development area would be mainly directed to the Helmcken Road / Watkiss Way intersection which would require significant upgrades to effectively handle the predicted 'Peak Hour' traffic volumes.

Traditional mitigation measures would comprise of capacity improvements onto and off of Watkiss Way at this location. Recommended mitigation measures within the context of this study would lean towards TDM measures as opposed to capacity improvements. Given the proximity to the Galloping Goose Regional Trail and excellent transit service, alternative mode facilities and incentives is critical. These potential developments should indicate measures of reducing SOV trips through TDM plans. These plans would require proactive measures to discourage SOV trips and encourage alternative mode trips.

Traffic Zone 5570

This traffic zone falls within the 'Hospital' Local Planning Area to the east of Helmcken Road. This area has limited potential for increased density given its current zoning and will generate an insignificant amount of new traffic under a full build-out scenario.

Mitigation measures recommended for this traffic zone relate to access management on Helmcken Road and Traffic Calming on local roads. Attempts should be made to reduce the number of direct access driveways on Helmcken Road in favour of consolidated access points and rear access lanes.

Traffic Zone 5580

This zone encompasses the portion of the 'Helmcken' Local Planning Area bounded by Island Highway to the south, TCH to the north, Burnside Road to the west and Helmcken Road to the east. Under the current OCP zoning, potential residential densification in this area along with the tourist commercial zoning, a modest amount of additional traffic could be generated within this zone.

Mitigation measures related to redevelopment in this zone may include a traffic signal at Island Highway / Burnett Road along with driveway access consolidation along Island Highway. Traffic and pedestrian volumes at this intersection should be monitored annually to evaluate whether traffic signal warrants are met in the future.

Traffic Zone 5590

This zone falls within 'Harbour' Local Planning Area bounded by Island Highway to the north, Price Road to the west, Helmcken Road to the east, and Esquimalt Harbour to the south. While this is mainly an established residential neighbourhood, potential redevelopment of the C-1 (village commercial) designated land-use could potentially generate a significant number of new peak hour vehicle trips.

Mitigation measures related to additional traffic within this zone are related mainly to access management in the form of consolidation and alternative mode facilities contained within the plan including, bike lanes, sidewalks and improved transit.

Traffic Zone 5600

This zone falls within 'Helmcken' Local Planning Area bounded by Island Highway to the south, Helmcken Road to the west, Portage Inlet to the east, and the E&N Rail corridor to the north. While this is mainly an established residential neighbourhood, potential redevelopment of the C-1 (village commercial) designated land-use could potentially generate a significant number of new peak hour vehicle trips.

Mitigation measures related to additional traffic within this zone are related mainly to access management in the form of consolidation and alternative mode facilities contained within the plan including, bike lanes, sidewalks and improved transit.

Traffic Zone 5610

This zone falls within 'Harbour' Local Planning Area bounded by Island Highway to the north, Helmcken Road to the west, Portage Park to the east, and Esquimalt Harbour to the south. While this is mainly an established residential neighbourhood, potential redevelopment of the C-1 (village commercial) designated land-use could potentially generate a significant number of new peak hour vehicle trips.

Mitigation measures related to additional traffic within this zone are related mainly to access management in the form of consolidation and alternative mode facilities contained within the plan including, bike lanes, sidewalks and improved transit.

Traffic Zone 5620

This zone falls within 'Craigflower' Local Planning Area and is comprised of the peninsula containing the Shoreline Drive neighbourhood.

With limited ability under the current OCP land-use bylaw for densification here, the estimated number of new vehicle trips associated to full build-out of this zone is less than significant when dispersed onto the surrounding road network

Mitigation measures for the long term include the evaluation of options to relocate the Shoreline Drive access to this neighbourhood to a location further west of its existing location. While this is not feasible at this time, should an opportunity arise, it would be prudent to consider this. Traffic calming is also recommended on this route.

Traffic Zone 5630

This zone falls within 'Craigflower' Local Planning Area bounded by Island Highway to the north, Portage Park and Esquimalt Harbour to the west, Admirals Road to the east, and Esquimalt Nations lands to the south.

With this area nearing build-out with the completion on the Thetis Cove development, there is little opportunity under the current land use bylaw for further densification.

rapid growth

The rapid growth scenario looks at full build-out of potential development areas throughout the town at an accelerated rate. As mentioned earlier in this report, a horizon year of 2015 was selected for this analysis.

A 1.5% per annum traffic volume increase was applied in the traffic model. Over the 9 year horizon, this equates to a 14% increase in traffic volumes by 2015. While this is a traditional approach to transportation planning, which is based on future population estimates and employment patterns, it should be noted that the existing regional road network does not have sufficient capacity to support this growth in vehicle traffic. Peak hour spreading would result.

Traffic signal coordination and optimization was applied in the model as these are relatively easy ways to maximize intersection and corridor performance. The following Table 8 summarizes the overall intersection level of service for the network.

Table 8 - *Future (2015) Build-out intersection level of service*

Horizon Year 2015 Conditions - Peak Hour Intersection LOS		
Signalized Intersection Location	AM Peak	PM Peak
Island Highway / Wilfert Road	E	C
Island Highway / Hart Road	C	A
Island Highway / Six-Mile Road	E	C
Island Highway / Burnside Road West	C	D
Island Highway / Knollwood / Kislingbury	B	A
Island Highway / Helmcken Road	F	F
Island Highway / Stormont	F	C
Island Highway / Admirals Road	C	C
Admirals Road / Glentana Road	A	A
Admirals Road / Aldersmith Road	A	B
Admirals Road / Hallowell Road	A	B
Helmcken Road / Watkiss Way	D	B
Helmcken Road / Burnside Road West	F	D



slow growth

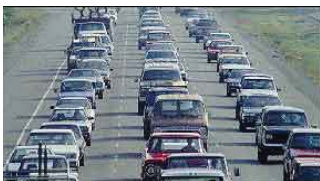
The slow growth scenario looks at full build-out of potential development areas throughout the town at a modest rate. As with the Rapid Growth scenario, a 1.5% per annum traffic volume increase was applied in the traffic model. Over the 20 year horizon, this equates to a 35% increase in traffic volumes by 2026.

Traffic signal coordination and optimization was applied in the model as these are relatively easy ways to maximize intersection and corridor performance. The following Table 9 summarizes the overall intersection level of service for the network.

Table 9 - *Future (2026) Build-out intersection level of service*

Horizon Year 2026 Conditions - Peak Hour Intersection LOS		
Signalized Intersection Location	AM Peak	PM Peak
Island Highway / Wilfert Road	F	F
Island Highway / Hart Road	F	F
Island Highway / Six-Mile Road	F	F
Island Highway / Burnside Road West	E	F
Island Highway / Knollwood / Kislingbury	C	B
Island Highway / Helmcken Road	F	F
Island Highway / Stormont	F	F
Island Highway / Admirals Road	F	F
Admirals Road / Glentana Road	A	C
Admirals Road / Aldersmith Road	A	D
Admirals Road / Hallowell Road	A	E
Helmcken Road / Watkiss Way	F	F
Helmcken Road / Burnside Road West	F	F

5.5 analysis summary



As shown in the preceding tables, with uninhibited growth in traffic volumes on the town road network, the ability of the infrastructure to effectively sustain this type of growth is limited. In order to manage this type of ongoing demand for capacity, drastic measures would be required to continue to accommodate this pattern of growth. The

town's ability to provide additional travel lanes and / or new routes to alleviate the imminent congestion is constrained by right-of-way issues, funding limitations but most importantly, by being in direct conflict with their stated vision for their community.

6

recommended improvements

6.1 walking and cycling

An important component to the overall strategy of trip reduction and transportation management is the pedestrian and bicycle linkages to and from development sites and their respective destinations. Walking and cycling are good alternatives to internal neighbourhood trips when the facilities are provided in an attractive and safe manner.

Some of the factors that must be addressed when considering these linkages are:

- ◆ Mixed land uses to provide amenities within a reasonable walking or cycling distance;
- ◆ Where to use marked bicycle lanes and bicycle boxes at intersections for individual treatment of bicycles;
- ◆ The linkages must form a complete interconnected system of path ways to and from each origin and destination; and
- ◆ The linkages must be attractive and safe (well lit in the evening).
- ◆ Linkages should be paved wherever possible, and of sufficient width to provide access for all users.



“Complete Communities offer housing, employment, shopping and services within walking distance, about 500m or 1/3 mile.”

~ CRD Regional Growth Strategy

bicycle routes

Bicycles are recognized as vehicles under the Motor Vehicle Act, and as such, should be afforded the same consideration as motor vehicles on the Town's street system. All roads within the town should be considered multi-use corridors which accommodate bikes and pedestrians.

Cyclists are more vulnerable to collisions and injuries, particularly when sharing roads with automobiles. Bicycles are more affected by pavement conditions, high winds, grades, poor visibility, traffic speeds and the width of the curb lane. As part of the Transportation Master Plan, the Town is developing and implementing a bikeway network system. This network is comprised of facilities that are specifically designed to encourage cycling and enhance the safety of cyclists. While the bikeway network will go a long way towards improving the cycling environment, the Town's efforts will not be focused solely on these principal cycling routes. Cyclists use all the streets in the Town, including arterial, collector and local roads. Every street should be made as safe and comfortable for cyclists as possible.

The bikeway elements of the Transportation Master Plan, shown in Figure 5, consist of a Bicycle Facility Plan to include additional routes paths within the Town. The intent of the plan is to improve the continuity of the existing bikeway system throughout the town, linking together existing and future residential, employment, commercial, institutional, industrial, and recreational centres. The objective is to expand the network of safe and convenient routes for both experienced and inexperienced riders.

A policy should be adopted that says when roads are "constructed or reconstructed," bicycle and pedestrian facilities must be provided. This is to be interpreted to mean that the Bicycle Policy is applicable when a road is built where no road was before OR when the curb widths change. The definition of "reconstructed" does not include maintenance resurfacing.

It should be noted that bicycle lanes are not appropriate for all streets. In situations where the pavement or right-of-way widths are too restrictive for the implementation of marked bike lanes, the use of 'sharrows' should be considered. These applications are appropriate for routes classified as local roads or minor collector roads.



“Sharrows” is a new design for expanding on-road bicycle facilities. The new “sharrow” marking - a bike stencil capped with a pair of chevrons - is a design pioneered in European and American cities that better identifies road positioning for both cyclists and motorists on narrower roads and travel lanes where marked bike lanes can’t fit into existing rights-of-way.



The new “sharrow” is expected to be endorsed by the Transportation Association of Canada (TAC) this fall and TAC is currently updating their bicycle facilities guidelines. As well, Capital Bike and Walk Society has released a research paper on this recently developed road marking which promises to greatly expand cycling networks in Canadian cities.

Experimental use of the “sharrow” can already be found in Victoria, Saanich and Vancouver in Canada and can be found in a number of American cities where performance of the design is being monitored by the U.S. National Committee on Uniform Traffic Control Devices.





Figure 5 - Bicycle Network Map

It is also important to recognize that the bicycle network is not restricted to road rights-of-way. The existing Galloping Goose and Lochside Regional Trails are important elements in a regional network and this network will be expanded with the addition of the E&N Rail Trail in the next few years.

As well, with new developments, or rebuilding of existing infrastructure, the concept of bicycles sharing spaces which previously may have been considered for pedestrian traffic only needs to be considered. This means that walkways may need to be wider to accommodate bicycle and pedestrian traffic in both directions to minimize conflicts between users.

An educational program should be developed which targets schools and informs young people of proper cycling techniques and etiquette.

Cyclists are riding roads in cities across the country where marked bike lanes and other facilities are helping to make roads safer and more appealing. Research shows that road markings, and other treatments to accommodate on-road cycling, are improving conditions for cyclists, enhancing safety and increasing the appeal of cycling as a transportation choice for many current and would be cyclists.



An educational program should be developed which targets schools and informs young people of proper cycling techniques and etiquette.

pedestrian network

The pedestrian elements of the Transportation Master Plan address two key objectives: convenience and safety. Convenience components of the plan will improve pedestrian system continuity in existing areas of the Town, extend the system into new subdivisions, and include pedestrian facilities as part of roadway and bridge improvement projects.

A listing of the recommended pedestrian system “safety” improvements are listed below:

- ◆ Pedestrian ‘walk’ and ‘clearance’ times set in traffic signal timing / phasing programs;
- ◆ Installation of crosswalks where none are present and pedestrian activity occurs;
- ◆ Provision of centre refuge medians to reduce pedestrian crossing exposure;
- ◆ Increased crosswalk visibility through better signing, pavement markings, and lighting;
- ◆ Improved physical facilities through annual maintenance of existing infrastructure; and
- ◆ Pedestrian and cycling safety education programs in schools and newspapers.

A parallel project, the Pedestrian Plan and Sidewalk Condition Inventory has also been conducted on behalf of the Town of View Royal. While the TMP looked at pedestrian corridors within the road rights-of-way, the Pedestrian Plan and Sidewalk Condition Inventory extended the analysis of the pedestrian network to the Galloping Goose Regional Trail, as well as trails and paths within the community.

Not only does the report inventory the existing sidewalk infrastructure, but in conjunction with the trails network from the Parks and Trails Master Plan, and the data on paths collected as part of this project, there is a comprehensive inventory of the infrastructure for alternative modes within the Town of View Royal.

These modal networks have also been mapped in conjunction with major land uses to ascertain the amount and type of access being provided and the opportunities for modal transfers examined. The results of these analyses were used to determine what gaps exist in these modal networks and their priority. The recommendations for projects and their priorities will be presented to the Town at the same time as the Transportation Master Plan.

6.2 transit - road

Bus transit will become an increasingly vital transportation mode in the future. Factors such as congested roadways, increasing fuel prices and environmental awareness will make transit use more appealing to a broader range of commuters. In conjunction with good land-use planning and developer based incentives, improved transit functionality and associated facilities will attract new riders.

Transportation centers would provide consolidated locations for intra and intermodal transfers between private automobiles (via park-and-ride lot or pick-up/drop-off), taxi service, bicycle and pedestrian facilities. The transportation centers would provide bus transit service and information (i.e., schedules, pricing, and transfer policies) and could be used to facilitate other TDM strategies such as rideshare matching programs.

BC Transit also has the ability to partner with developers and major employers in providing bus pass cards that monitor the usage of the individual rider. A developer or employer can establish a program of funding to subsidize the cost of the bus passes.

Currently, there is limited bus transit service along Island Highway east of the Thetis overpass. There are three distinct service routes along this corridor. The first route being Route 25 which connects the Park and Ride at Western Exchange to Admirals Walk, Department of National Defence (DND), through Esquimalt and into Victoria, terminating at Cedar Hill Road / Blenkinsop Road. While this service provides a good alternative for commuters to the commercial areas of Admirals Walk, its main benefit is its ability to service the major employment centre of DND. With continued expansion of the workforce anticipated over the next several years, this service will become more important in reaching the goals of the plan to have a modal shift to bus transit.

The second route, Route 39, connects the Park and Ride at Western Exchange to Admirals Walk, DND, through Esquimalt and into Victoria. The third route being Route 14, connects the Victoria General Hospital and the University of Victoria. For route maps, see Appendix G.



Service/Frequency Improvements

BC Transit increased bus frequency for the main route (#50 Goldstream) between the Westshore and Downtown Victoria in September 2007. For the town, this means that bus headways will be established at 5 minute intervals along Island Highway between the Colwood border and Thetis overpass during peak periods. It is anticipated that this improvement in convenience will result in increased ridership, having the effect of removing Single Occupant Vehicles (SOVs) from the road network. This is one step in the longer term goal of providing 'transit only' lanes along the Douglas Street corridor in downtown Victoria. This will further enhance the benefits of bus transit use between these major centres.



BC Transit has indicated that two new transit routes are to be established within the town. A new route servicing Atkins Road (Route 53) commenced in Fall 2007, and another new route servicing Thetis Lake Park is likely to commence by Summer 2008 if budget permits. They are also contemplating new and / or frequent service on other major routes in the foreseeable future including Route 14.

Although BC Transit does not currently observe a demand for increased service along the rest of Island Highway, improvements to the pedestrian network and transit facilities will make bus transit a more viable alternative for a wider spectrum of potential riders. Along with the recommended facility improvements, peak hour headways should be reduced from approximately 30 minutes to 15 minutes along each route. Direct, frequent peak hour service between Western Exchange and DND should be evaluated.

Trip reductions are dependent on the nature of transit facilities. Increases in bus frequency, the cleanliness and quality of the bus shelters and the safety of the surrounding environment all play a part in making transit an attractive alternative to the SOV. Bus transit is enhanced when there are direct, safe, walkable links to transit stops. Pathways should be lit in the evenings and be barrier free.

Bus stops should be designed in a safe manner and be accessible to all users. Bus 'pull-outs' are preferred, particularly along the Island Highway, where vehicle throughput will continue to be a major consideration. Bus pull-outs allow vehicle and bicycle traffic to safely travel past a bus that is loading / unloading passengers resulting in less overall delay along the corridor.

6.3 transit - rail

There are two potential rail transit corridors traversing the town. While future development plans exist for a Light Rapid Transit route from Langford, along the Galloping Goose corridor to and along Douglas Street in downtown Victoria, the E&N Rail line is also a potential commuter rail route connecting communities further north with the LRT service within the Capital Regional District.

There are at least four locations within the town which are or could be candidate sites for future commuter rail stations. The most significant of these locations is located at the northeast end of Atkins Road where the E&N rail corridor and the Galloping Goose corridor converge, as seen in the following Figure 6.



Photo: Wilfred Gibson, 1955

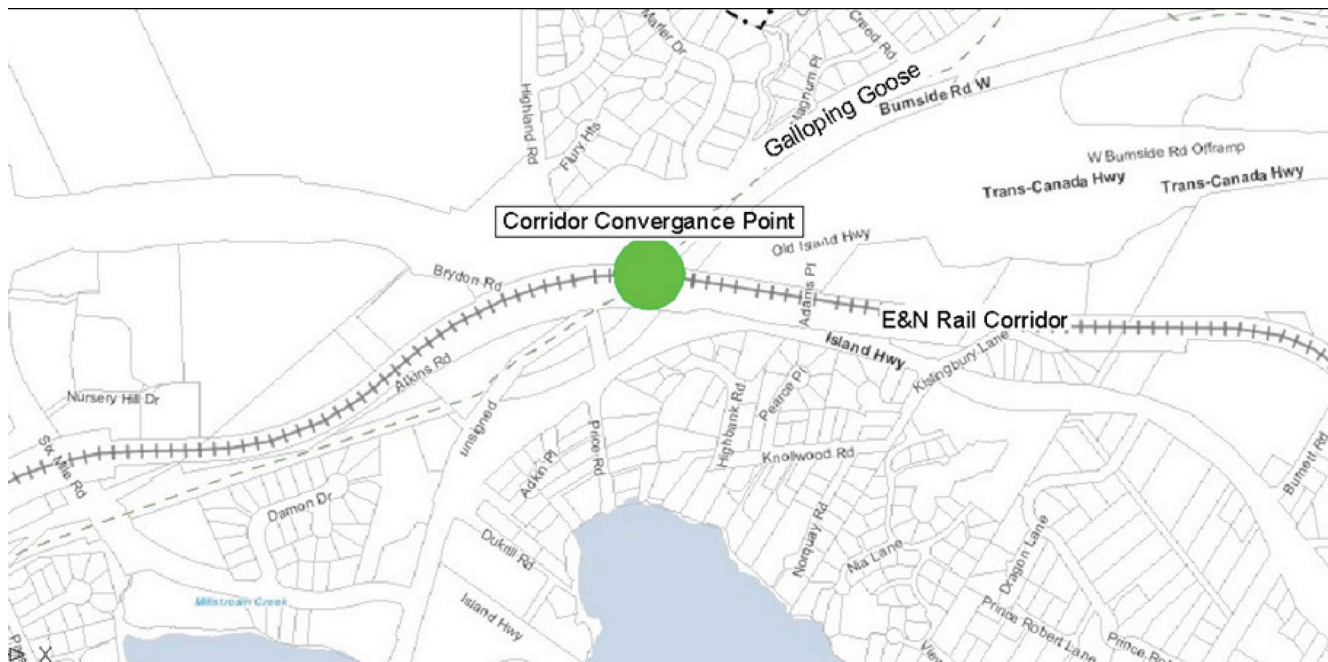


Figure 6 - E&N Rail and Galloping Goose Corridors

This location would be ideal in serving the Atkins Road Planning and Development area and would also serve as a natural transfer point for commuters from the north to re-direct to a future Light Rapid Transit system contemplated to serve the downtown Victoria business district. A bus transit exchange would also be recommended for a facility at this location.

A graphic representation of what this station could look like can be seen in the following Figure 7 which would serve as transfer point for rail commuters destined to and from the City of Victoria and the Westshore communities and beyond.

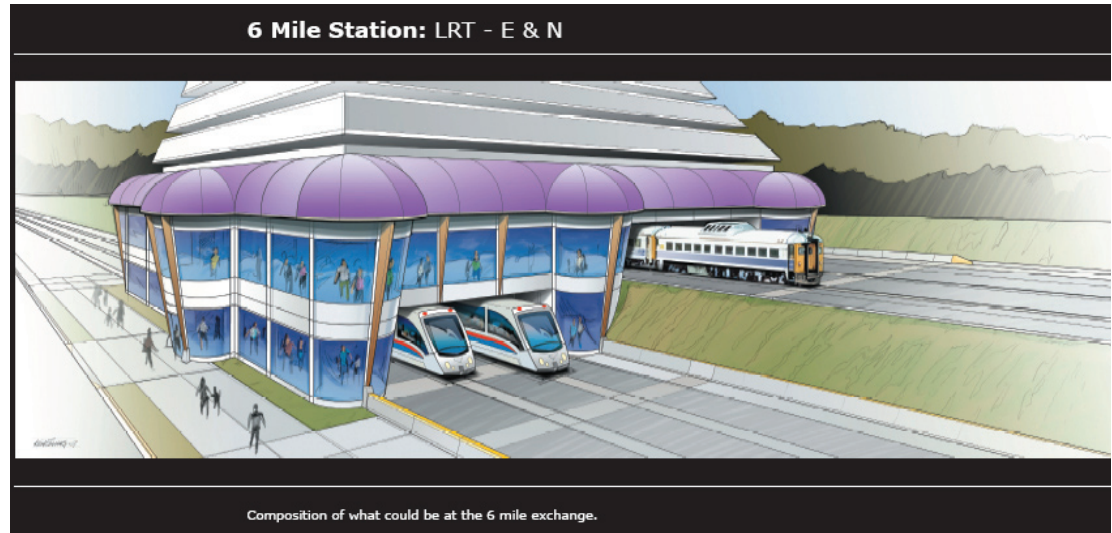


Figure 7 - Artist ~ KenFaulks.com

Lands adjacent transit stations locations are an ideal candidate for high density development. Consideration should be given to preserving lands adjacent to this and other potential transit station locations for this purpose.

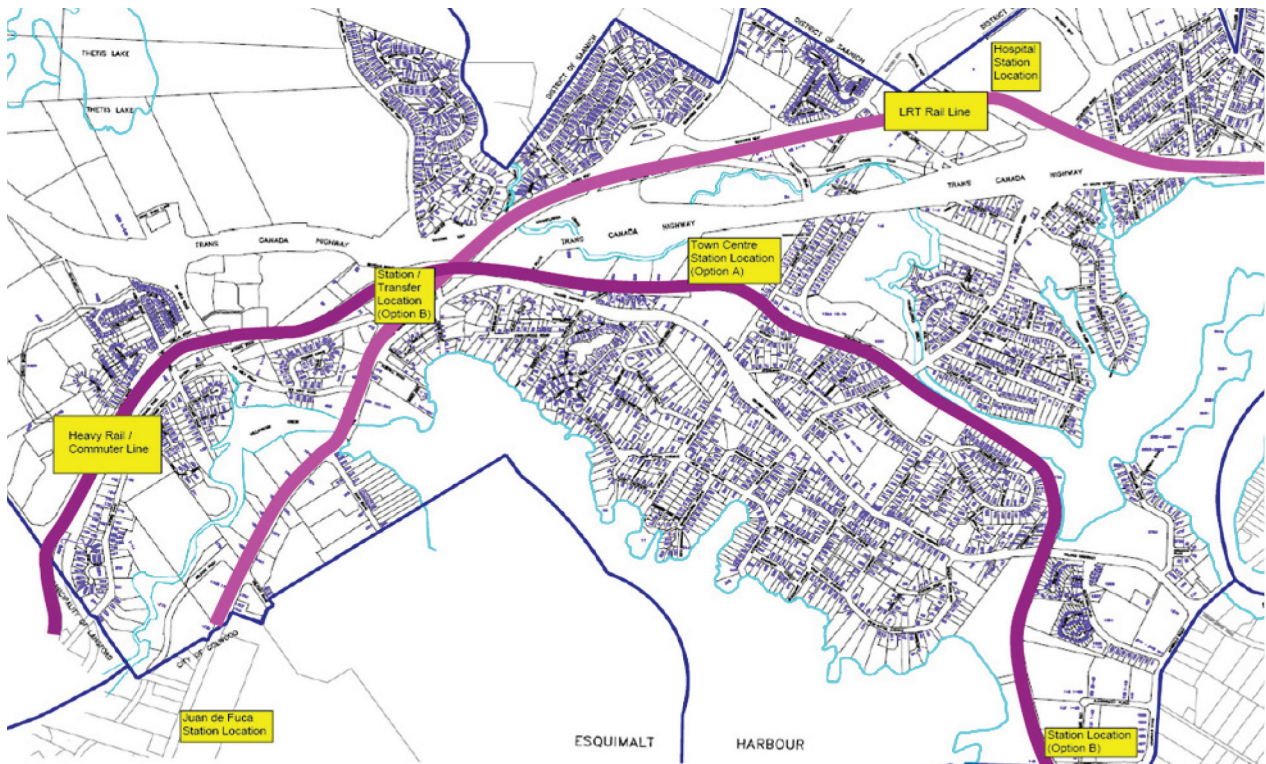


Figure 8 - Potential Rail Station Locations

6.4 road design criteria

The Geometric Design Guide for Canadian Roads published by the Transportation Association of Canada and the Geometric Design Standards Manual published by the Ministry of Transportation provide guidance on the geometric design of roadways and intersections, including minimum lane dimensions, storage lengths, corner clearances, medians and intersection angles. While the designs contained within this report are conceptual in nature, they have been developed considering these standards. Detailed design of roadworks within the Town of View Royal should adhere to these published standards.

road network

The functional classification used was previously described in Section 4.2 and summarized in Figure 9 below in terms of the relationship between access and mobility. The recommended road network for the Town of View Royal is illustrated in Figure 10. Arterial roads, such as provincial highways, have limited access, higher speeds, higher capacities, the lowest accident rates and higher design standards with respect to cross-sections as well as vertical and horizontal curvature. As more access to adjacent lands are provided, operating speeds and capacity decrease while accident rates increase and design standards reflect these changes. At the other end of the access / mobility spectrum are local roads which are designed to provide access to land uses and consequently they have the lower speeds, capacities and design standards to facilitate this access.

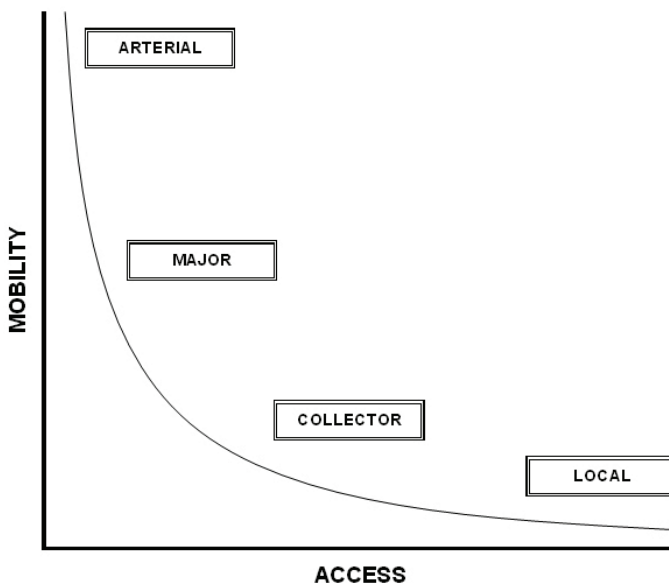


Figure 9 - Mobility / Access Relationship



Figure 10 - Road Network Map

major roads

The extent of the recommended roadway improvements found within this plan cover approximately 11km of varying classifications of roadway. For the purpose of depicting the improvements graphically, the network has been segmented into Major, Collector, Local roads and further subdivided as appropriate. The following sections provide a 'snapshot' of the key recommended improvements and more detailed graphical representations are presented in Appendix H. Appendix I contains a description of recommended cross section elements for the various road sections.

Island Highway

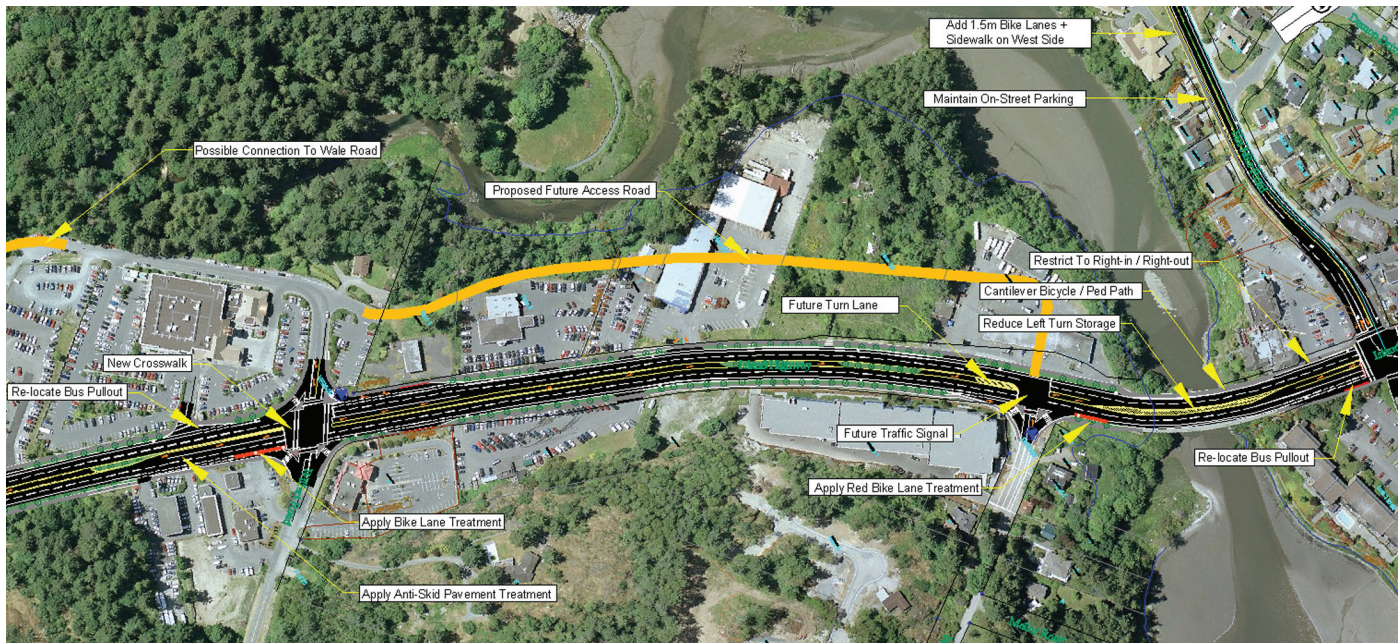


Figure 11 - Island Highway from Colwood Border to Six Mile Road

- | | |
|-------------------------------------|---|
| ◇ 1.8m bike lanes continuous | ◇ Coordinated signal timing plans |
| ◇ 2.0m sidewalks continuous | ◇ Coloured bike lane treatment at Wilfert Road |
| ◇ 2.0m landscaped boulevards | ◇ Allowance for future left turn lane |
| ◇ Landscaped medians where feasible | ◇ Relocate bus pull-out |
| ◇ Anti-skid pavement on grades | ◇ Install new pedestrian crossing at Wilfert Road |
| ◇ Future signal at Hart Road | ◇ Consider new parallel access road |
-
- ◆ Should future redevelopment occur at 1610 Island Hwy, a dedicated left turn lane on Island Highway is to be preserved for future driveway access directly opposite Hart Road.
 - ◆ As redevelopment occurs in this area, it would be desirable to provide an easement for a parallel road link for access to future developments. This could provide an opportunity to reduce the number of driveway accesses directly onto Island Highway. The access road could connect to Wilfert Road.

- ◆ Traditionally, the preferred location of a bus stop near a signalized intersection is on the 'far' side. This ensures less overall delay as occasionally busses must merge back into a traffic stream that is experiencing queuing from the red signal phase. With the double left turn EB on Six Mile Road, the pedestrian crossing has been relocated to the south approach of Island Highway. It is recommended that the bus stop be relocated here as well, although property acquisition is required. The implementation of a bus priority phase would allow busses to move ahead of any queue in this travel direction.
- ◆ A study is pending to consider connecting Wilfert Road to Wale Road which is within the City of Colwood's municipal boundary.
- ◆ Consideration of a parallel connection between Hart Road and Wilfert Road is to provide access for future development from this facility rather than having all business-related traffic use Island Highway.

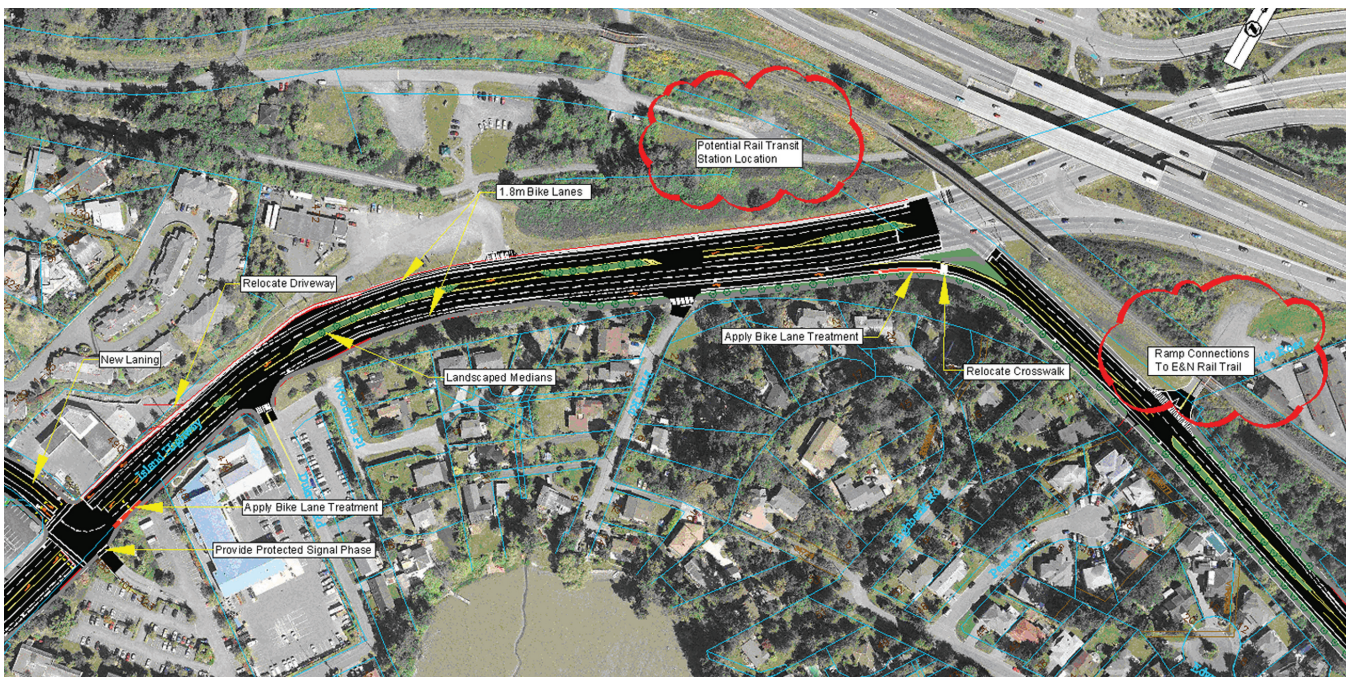


Figure 12 - Island Highway from Six Mile Road to Kislingbury Lane / Knollwood Road

- | | |
|------------------------------|---|
| ◆ 1.8m Bike lanes continuous | ◆ Relocate crosswalk at landscaped Island |
| ◆ 2.0m Sidewalks continuous | ◆ Provide left turn lanes at all access locations |
| ◆ 2.0m landscaped boulevards | ◆ Bike lane treatments |
| ◆ Landscaped medians | |
| ◆ Left turn lanes | |
- ◆ With the new laning configuration at the intersection of Six Mile Road recently completed, cyclists on Island Highway experience greater exposure to traffic turning left from Six Mile Road onto Island Highway as both lanes are utilized. Special bike lane treatment is recommended here.

- ◆ Potential for relocation of the existing bus pull-out at #1 Island Highway to 485 Island Highway should be examined. This also would require private property acquisition in the form of an easement.
- ◆ Currently, there is potential for vehicle conflicts between traffic exiting the Shell gas station at 490 Island Highway and left turning traffic from Dukrill Road. This plan recommends that the northernmost driveway from the Shell Station be relocated slightly south of its' current location and that a protective median be constructed on Island Highway to minimize this risk.
- ◆ The crosswalk at the channelized eastbound lane approaching Adams Place should be relocated slightly west of its current location, directly under the existing street light fixture. This location will provide improved sight distance for approaching vehicles as well as better visibility at night. Special bike lane treatment is also recommended at this location.

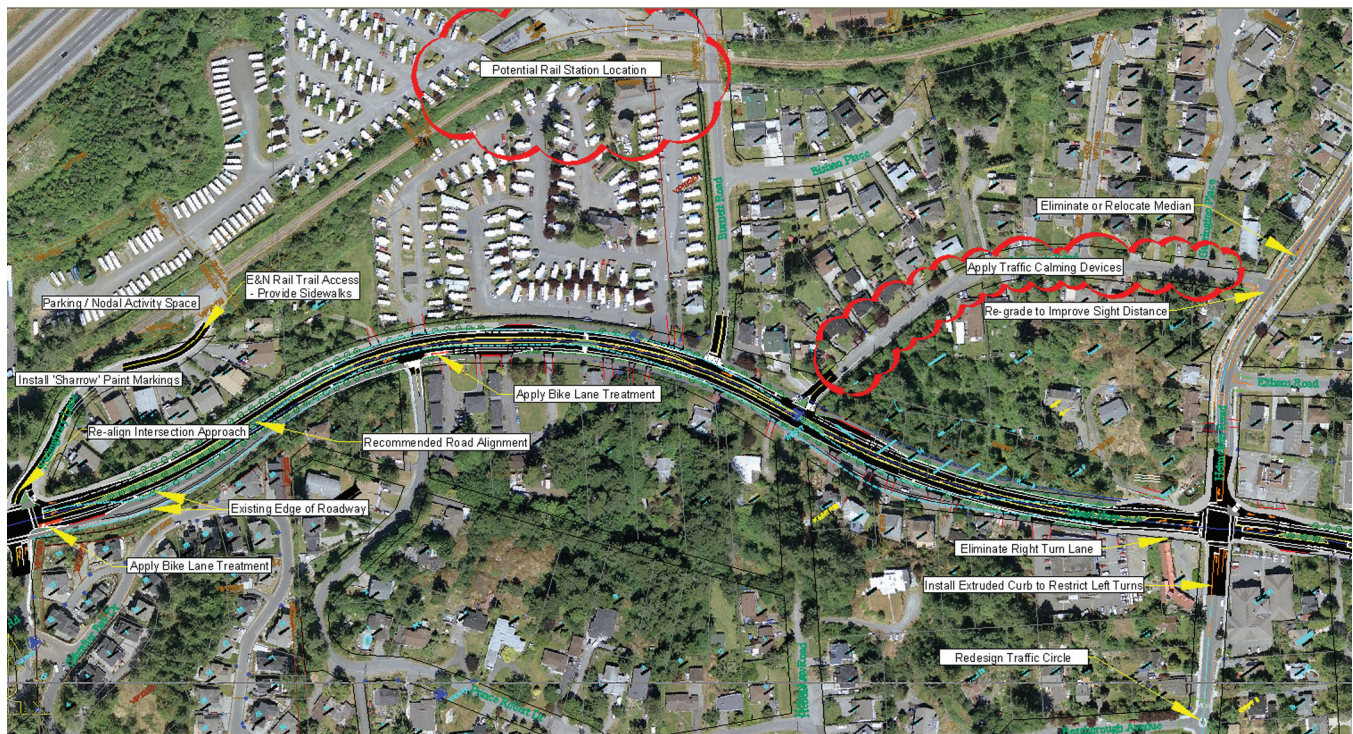


Figure 13 - Island Highway from Kislingbury Lane / Knollwood Road to Helmcken Road

- ◇ 1.8m Bike lanes continuous
- ◇ 2.0m Sidewalks continuous
- ◇ 2.0m landscaped boulevards
- ◇ Landscaped medians where feasible
- ◇ Left turn lanes
- ◇ Realign section of Island Hwy between Knollwood / Kislingbury and Jedburgh Road
- ◇ Redesign of traffic circle at Bessborough Avenue / Helmcken Road

- ◆ Much of the existing roadway along this section of Island Highway does not lie in the centre of the right of way. An improved roadway alignment has been recommended along this section which will reduce the horizontal curvatures and improve safety. Reconstruction of this section would also provide opportunity to correct the geometric deficiencies related to superelevation.
- ◆ On horizontal curves, drivers tend to hug the inside of the curve as centrifugal force is minimized at this area of a curve. Evidence of vehicles wandering into the bike lane is made evident by the premature wearing of the paint markings. Special bike lane treatments are recommended in sections where this is evident.
- ◆ Due to the additional roadway width required to accommodate the recommended cross section, the existing eastbound right turn lane at Helmcken Road will be eliminated. This will have little effect on traffic operations as this movement has little demand. Should future redevelopment occur at 301 Island Highway, the Town may have an opportunity to acquire sufficient frontage to reconstruct a new lane here if desired.
- ◆ The detailed design of the E&N Rail Trail needs to be acquired to determine how to realign Kislingbury Lane. It appears to be on E&N right-of-way and may function as a connection between the road network and the E&N Rail Trail in order to allow trail users to cross the Island Highway / Burnside Road intersection at grade.

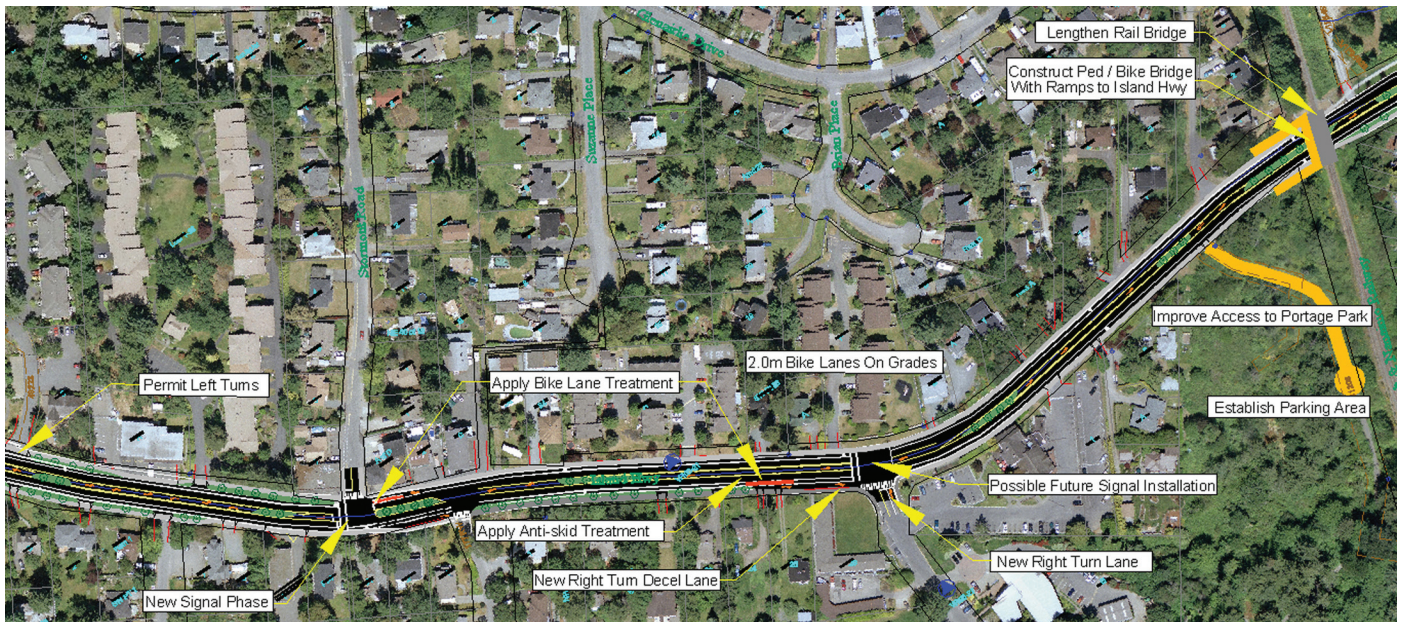


Figure 14 - Island Highway from Helmcken Road to Four Mile Trestle

- ◇ Planted medians and boulevards where feasible
 - ◇ Widen rail trestle for left turn lane
 - ◇ Use road access to connect to E&N Rail Trail
 - ◇ Potential parking area for parking to access trail for walking and cycling
 - ◇ Ramps to E&N Rail Trail
 - ◇ New right turn Deceleration lane at View Royal Avenue
 - ◇ 2.0m bike lanes on grades
 - ◇ Monitor intersection of View Royal Avenue for signal warrants
 - ◇ New Eastbound left turn protected signal phase
- ◆ This section of Island Highway has the highest density of direct accesses with no facilities present for left turning vehicle storage while waiting for gaps in opposing traffic to negotiate the turn. Left turn lanes are recommended along this section to reduce delay and improve safety.
 - ◆ Wider bike lanes are recommended for portions of this section of Island Highway with steep grades. For climbing, as the effort level increases, cyclists tend to use more of the lane. When going downhill, the greater speed means any movement requires more of the lane width as well.
 - ◆ Along with a dedicated left turn lane at Stormont Road, an associated protected signal phase for this movement is recommended as the opposing traffic volumes are heavy during the PM Peak Hour and gaps in traffic are minimal.
 - ◆ The intersection of Island Highway and View Royal Avenue should be monitored following the implementation of the recommended roadway improvements. With the reduction in roadway friction anticipated, traffic flows will become more constant and fewer gaps will be available the traffic turning left onto View Royal Avenue. Future signalization may be appropriate.

- ◆ Due to the steep downhill grade, anti-skid pavement treatment is recommended on the eastbound approach to View Royal Avenue to reduce the chance of rear end collisions particularly in adverse weather.
- ◆ A right turn deceleration lane is recommended on Island Highway at View Royal Avenue. This lane is intended to serve as a bus pull-out as well.
- ◆ A dedicated right turn lane is recommended on View Royal Avenue at Island Highway. This lane will allow right turning vehicles an opportunity to egress onto Island Highway without being blocked by left turning vehicles.
- ◆ The existing E&N Rail bridge should be extended to accommodate the recommended roadway cross-section. Ideally, the abutment on the north end would remain in place and the widening would occur to the south. This will reduce the horizontal curvature of the road at this location.
- ◆ During the construction of the E&N Rail Trail, a parallel trail bridge is to be constructed over Island Highway. Access ramps to / from the bridge are recommended at this location and should be designed for wheelchair accessibility.
- ◆ Parking on road right-of-way along Island Highway in vicinity of Stormont Road should be removed.
- ◆ Sidewalk in this area and further west should be realigned and marked to indicate pedestrian activity. This may impact some of the fire hall parking to the east of the fire station.
- ◆ Install signals for emergency vehicle access to Island Highway.

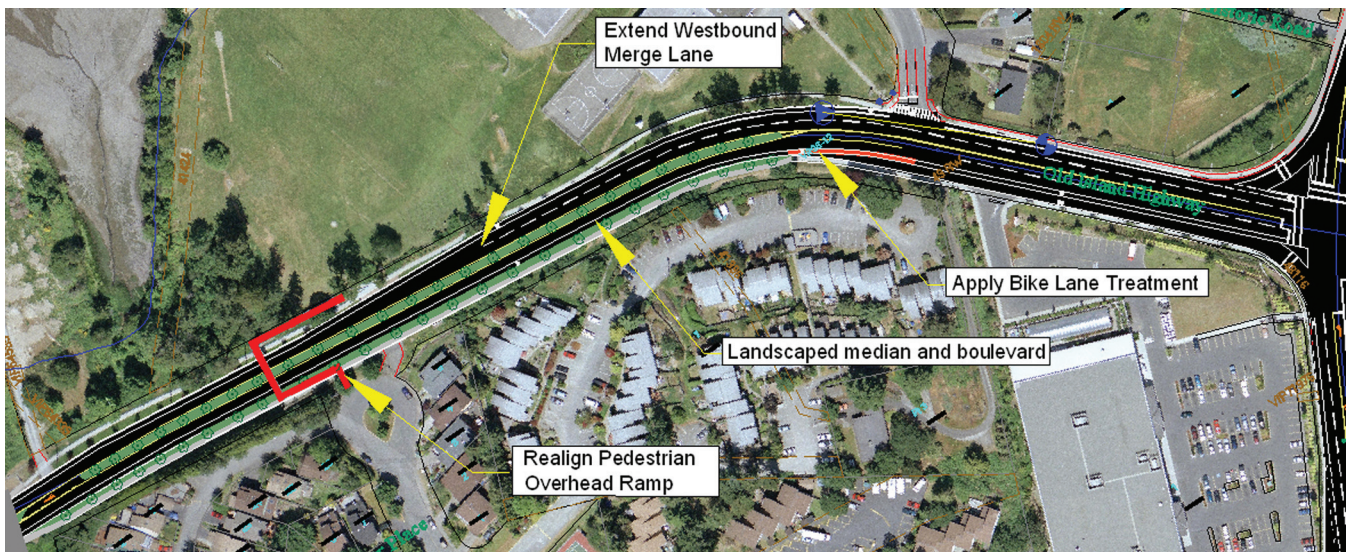


Figure 15 - Island Highway from Four Mile Trestle to Admirals Road

- ◆ Extend westbound merge lane
- ◆ Realign south ramp to the pedestrian overpass
- ◆ Connect directly to Glentana Road
- ◆ Landscaped boulevards and medians
- ◆ Bike lane treatment at Admirals Road eastbound right turn lane

- ◆ The Plan calls for the extension of the westbound merge lane to improve conditions at the Admirals Road / Island Highway intersection. The existing right lane drop at Shoreline drive requires through traffic to merge into the left through lane almost immediately beyond the intersection. This recommended improvement will add capacity while making the weave into the through lane less difficult.
- ◆ The existing pedestrian overpass is intended mainly to serve school children in the Glentana Road area neighbourhood attending Shoreline School. The southern ramp should be re-aligned to connect with the Glentana Road cul-de-sac. This may result in fewer children crossing Island Highway at grade.
- ◆ The existing bike lane on Island Highway must be crossed by vehicles turning right onto Admirals Road. Special bike lane treatment is recommended at this location.
- ◆ End of merge lane and position of centre line to be finalized in detailed design phase.

Admirals Road

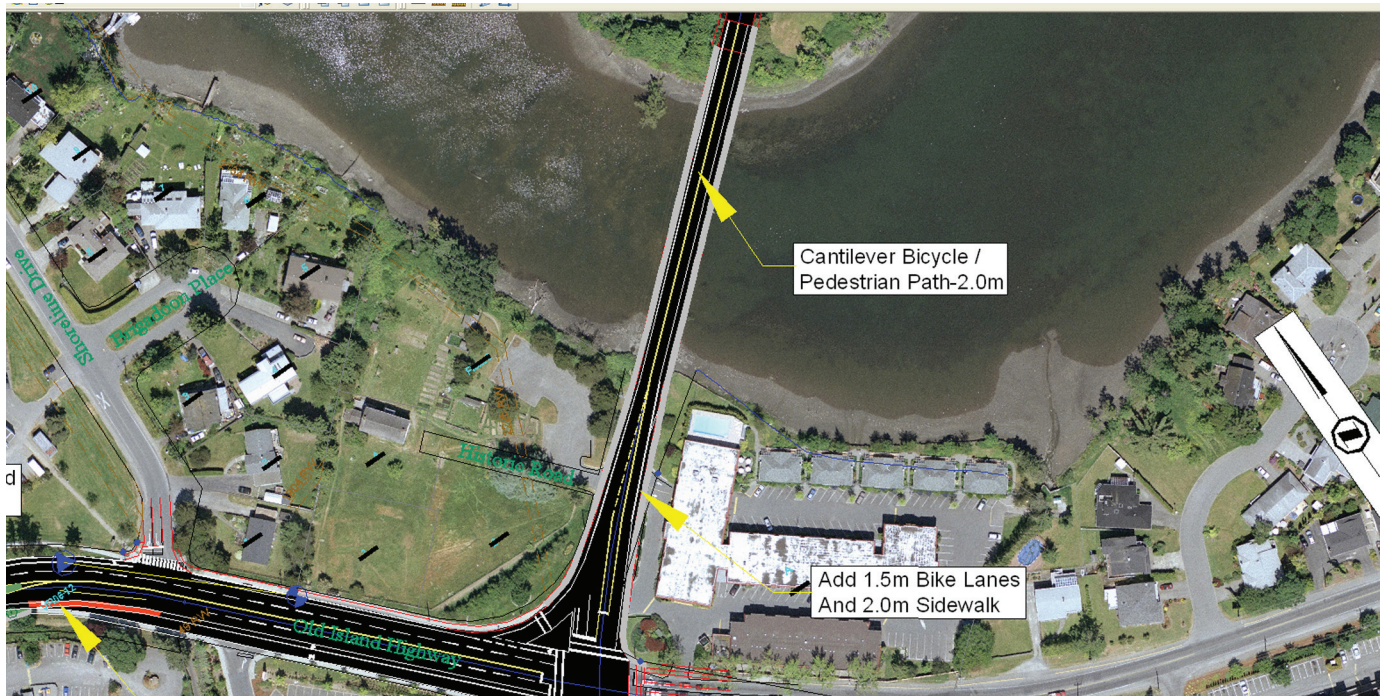


Figure 16 - Admirals Road north of Island Highway

- ◆ Cantilevered pedestrian and cyclist facilities are proposed across the Craigflower bridge span which would tie into new bike lanes and sidewalks recommended for Admirals Road
- ◆ The existing sidewalk on the west side of Admirals Road would be reconstructed to allow room for the 1.5m bicycle lane, and a new sidewalk is to be constructed on the east side.

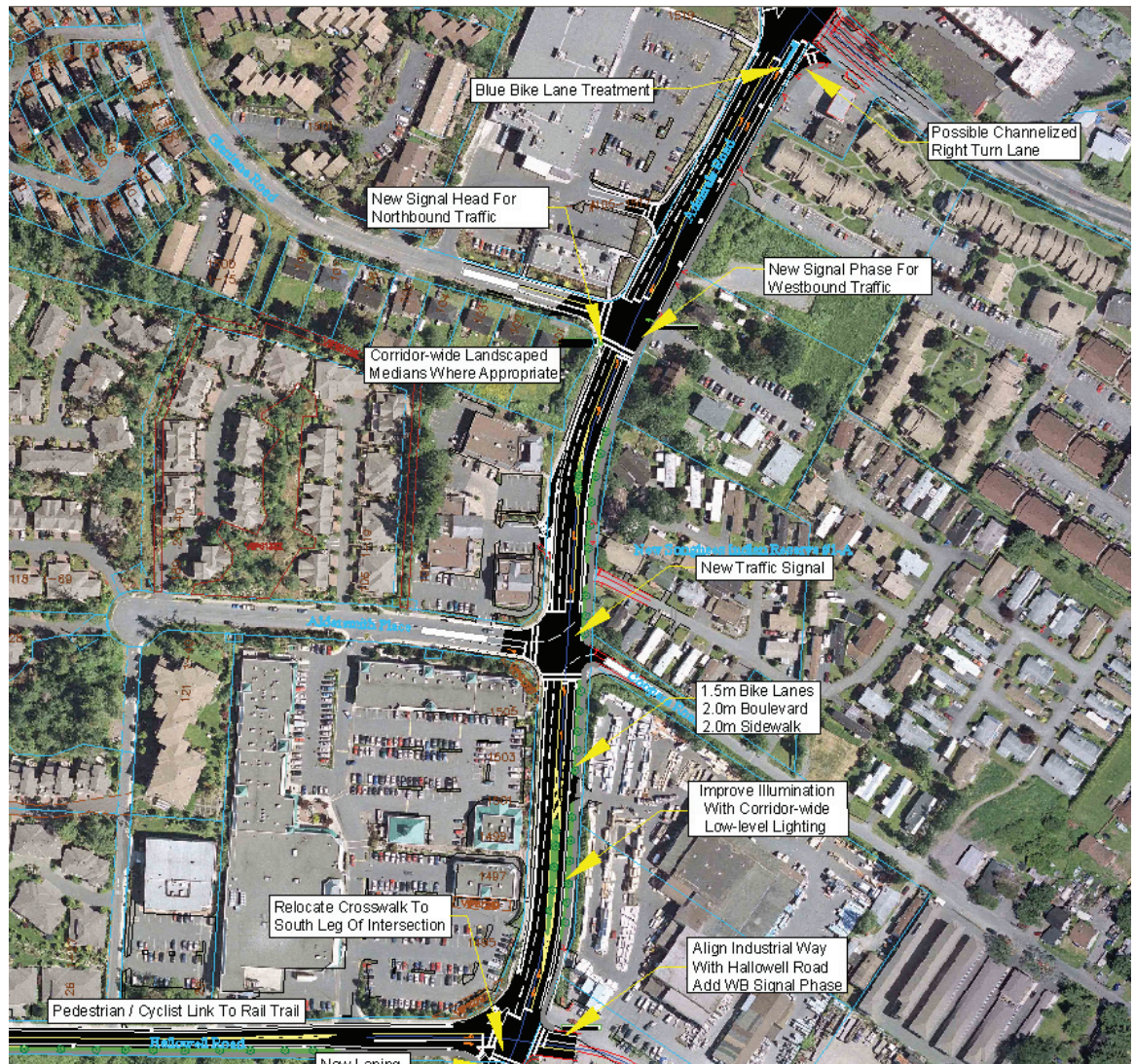


Figure 17 - Admirals Road from Island Highway to Hallowell Road

- ◇ New Signal at Aldersmith
 - ◇ New WB Signal Phase at Glentana
 - ◇ Extend second Admirals Road southbound travel lane through the Hallowell Rd intersection
 - ◇ 2.0m landscaped boulevard on east side
 - ◇ 1.8m Bike lanes
 - ◇ 2.0m Sidewalks on east side
 - ◇ Relocate crosswalk at Hallowell
- ◆ The west side of Admirals road has been improved over time through development of the commercial centre. The east side of Admirals road lacks facilities for pedestrians. Sidewalks and bike lanes are recommended along this roadway section. It should be noted that the section of sidewalk proposed to the north of Glentana Road will encroach on private property. Where there is sufficient right of way, 2.0m boulevards are recommended.

- ◆ Corridor-wide improvements to illumination are required.
- ◆ A new painted “Blue Box Bike Treatment” section is recommended as a refuge for northbound left turning cyclists with bike activation at the traffic signal on Island Highway.
- ◆ For operational reasons, a new channelized right turn lane from Admirals Road northbound onto Craigflower Road should be considered. This would improve the overall intersection performance in both the north and south directions. It appears to encroach on private property, and may require negotiation for an easement.
- ◆ A new ‘westbound’ traffic signal phase is recommended at the intersection with Glentana Road. This will improve safety for vehicles exiting the Esquimalt First Nations Band office.
- ◆ Traffic exiting Admirals Walk and the residential developments in the Aldersmith area with a destination to the north tend to use Hallowell Road to make this movement. The traffic signal provides for safe egress onto Admirals Road. With future development anticipated in the area, a new traffic signal is recommended for the Aldersmith intersection. This will create more balanced traffic flows from the area.

Helmcken Road



Figure 18 - Admirals Road from Island Highway to Hallowell Road

- ◆ Improve Sight Distance at Jedburgh
- ◆ Reconstruct curb radii at local road intersections to 6.0m radius.
- ◆ Trail ramps to E&N at / near school
- ◆ Improve curbs of existing roundabouts to mountable curbs to allow over-dimensioned vehicles to traverse them

- ◆ Sight distance at the intersection of Jedburgh Road and Helmcken Road is limited by the vertical curve on Helmcken Road. It is recommended that re-grade this section of Helmcken Road to improve sight distance deficiencies be undertaken. It is further recommended that the planted centre median be eliminated or relocated to a location further north so as not to impact the sight lines of drivers exiting Jedburgh Road.



- ◆ During the reconstruction of Helmcken Road, curb radii at local road intersections were designed in a non-standard manner. It is recommended that these curbs be reconstructed to provide a minimum 6.0m radius.

- ◆ The two roundabouts on Helmcken Road were constructed with a non-mountable 'Truck Apron'. Although Helmcken Road is not a designated 'Truck Route', there are occasions where it is necessary or over-dimensioned vehicles to use this route including vehicles with trailers. Additionally, this condition could be considered a safety issue for smaller vehicles, including bicycles and motorcycles. It is recommended that the centre apron be modified and mountable curbs be installed.
- ◆ During the construction of the E&N it would be prudent to supply pedestrian access ramps at or near View Royal Elementary school.



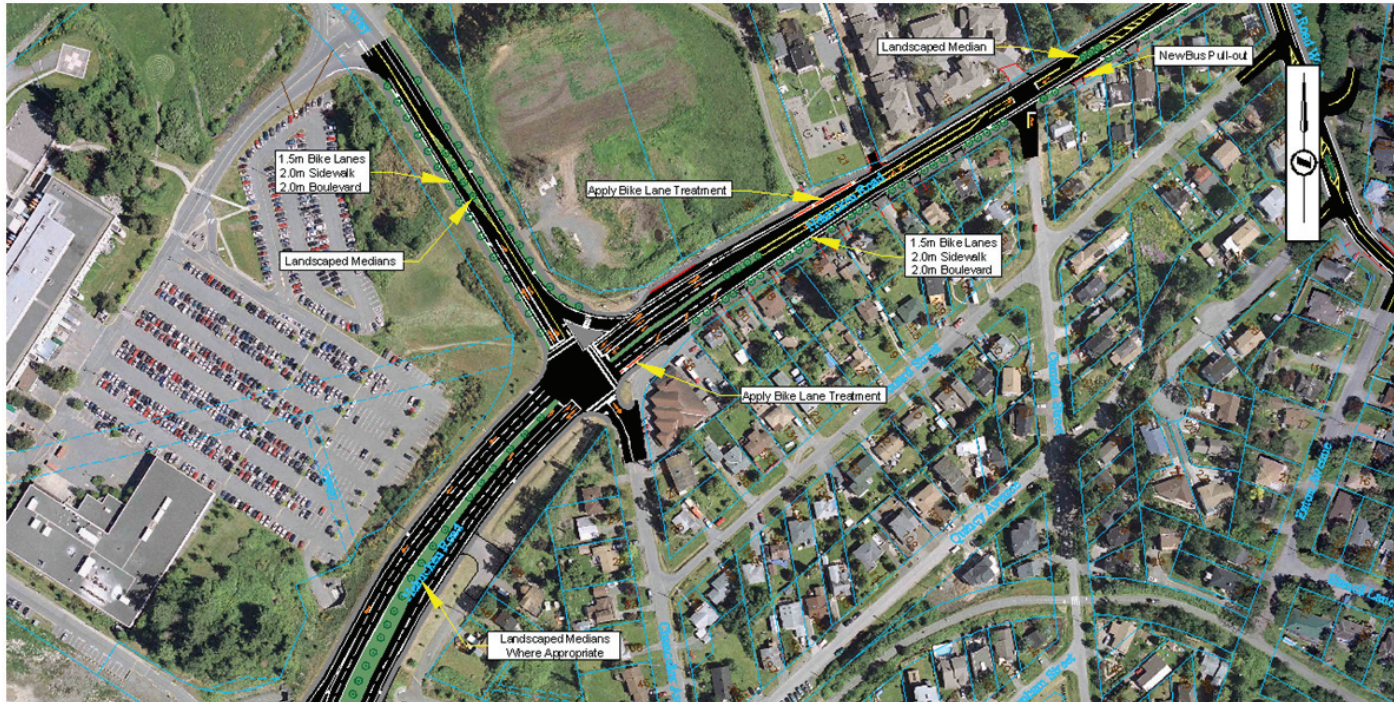


Figure 19 - Helmcken Road from TCH to Burnside Road West

- ◇ 2.0m Sidewalks
 - ◇ 2.0m landscaped boulevards – east side
 - ◇ Construct new bus stop
 - ◇ Landscaped medians where feasible
 - ◇ Continuous bike lanes
 - ◇ Driveway access management
-
- ◆ As the primary link between the north and south sections of the town, it is critical that this section be designed to accommodate all modes. While most of the east side of the roadway has been improved through redevelopment projects, the east side has limited sidewalk coverage. Continuous sidewalks should be constructed at this time. Costs could be recovered through Development Cost Charges as redevelopment occurs on this side of the corridor.
 - ◆ A new northbound bus stop should be developed at or near Camden Street.
 - ◆ Landscaped medians should be provided where feasible.
 - ◆ There are a number of direct access driveways on the east side of Helmcken Road between Chancellor Avenue and Burnside Road West. As redevelopment occurs in this area, consideration should be given to consolidation of driveways.
 - ◆ Landscaped medians should be provided where feasible.

Burnside Road West

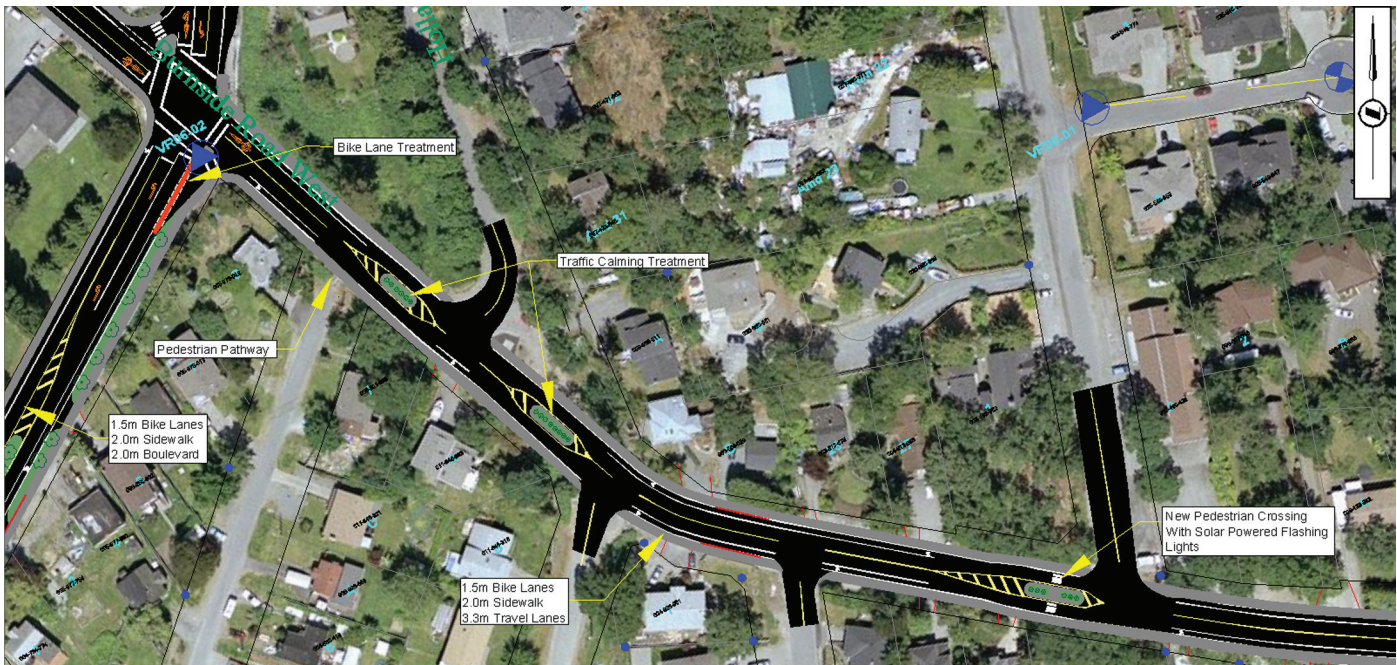


Figure 20 - Burnside Road West from Helmcken Road to Saanich Municipal Border

- ◇ 3.3m travel lanes
 - ◇ 2.0m Sidewalks
 - ◇ 1.5m bike lanes
 - ◇ New pedestrian crossing at High Street
 - ◇ Planted medians for traffic calming
- ◆ The District of Saanich has plans to reconstruct the portion of Burnside Road West bordering View Royal. The Town of View Royal has endeavoured to maintain a cross-section on this portion of the road that is consistent with the proposed cross-section for the District of Saanich section.
 - ◆ A pedestrian crossing including a median refuge and pedestrian activated solar powered flashing should be constructed at High Street in conjunction with traffic calming along this section of Burnside Road West.
 - ◆ Although the posted speed along this route is 30km/h, field observations indicated that frequent speeding does occur. Landscaped medians of sufficient width to provide some horizontal vehicle deflection should be constructed where feasible to discourage this activity.

Six Mile Road

Figure 21 - Six Mile Road

- ◇ 3.3m travel lanes
 - ◇ 1.8m bike lanes
 - ◇ Maintain on-street parking
 - ◇ Construct planned Roundabout
 - ◇ New 2.0m sidewalk on south / west side
 - ◇ New crosswalks at Chilco Road and Hwy 1 on-ramp
-
- ◆ While some new bus transit service has been introduced in this area, the town should continue discussions with BC Transit to provide additional service to Thetis Lake Park during Summer periods.
 - ◆ A new sidewalk should be constructed on the south side of the road connecting to Thetis Lake Park. New crosswalks would be associated with this construction.
 - ◆ The south side on-street parking should be maintained along the residential frontage adjacent Damon Drive.
 - ◆ The planned roundabout intersection control at Atkins Road should be constructed.
 - ◆ Pave the Galloping Goose connections to the adjacent road network and bicycle lanes.

Watkiss Way

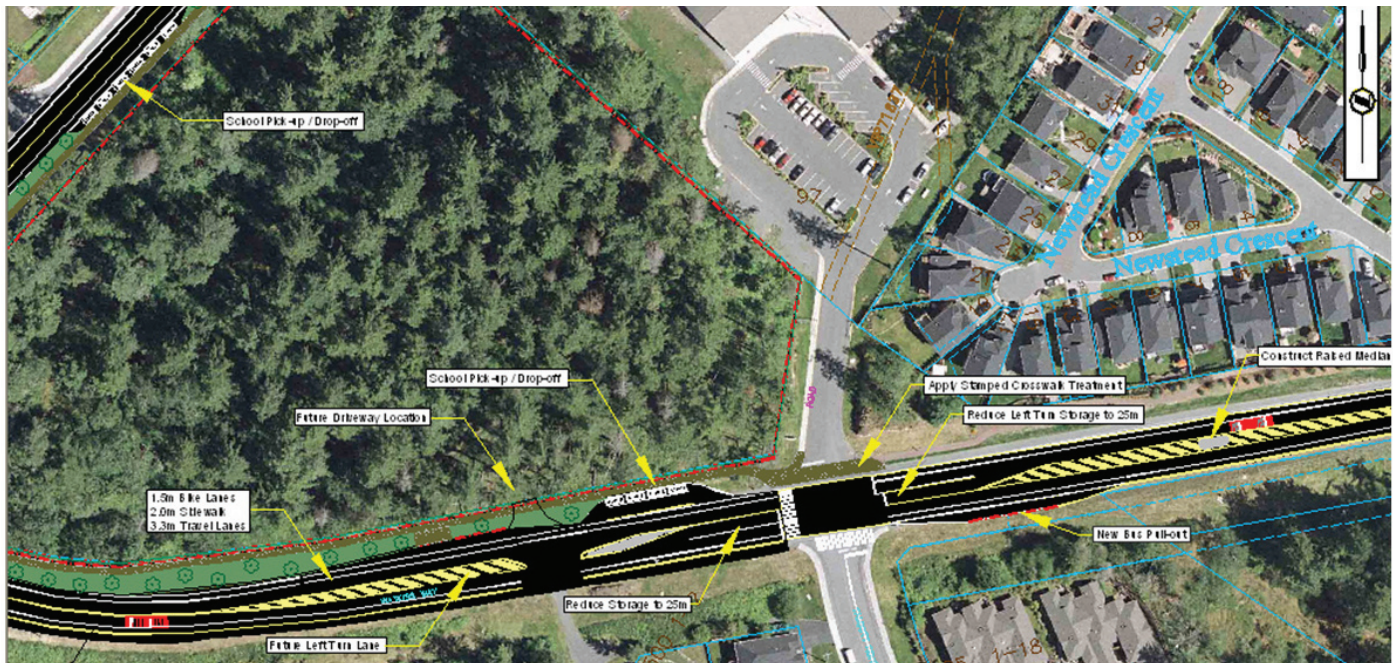


Figure 22 - Watkiss Way from Burnside Road West to Helmcken Road

- | | |
|---|--|
| ◇ 3.3m travel lanes | ◇ Construct an extruded asphalt curb on south side |
| ◇ 1.8m bike lanes | ◇ Construct school pick-up / drop-off area |
| ◇ 2.0m sidewalk and landscaped boulevards on north Side | ◇ Construct raised concrete medians |
| ◇ Reduce Left Turn storage lengths | ◇ Relocate westbound bus bay |

The nature of the roadway design and topography along this section of Watkiss Way contributes to higher than posted speeds being experienced. While some effort has been made to discourage this activity through the implementation of warning devices, the presence of the Elementary School warrants other measures of speed control and safety devices.

- ◆ Special attention to speed limit enforcement should be given here.
- ◆ Left turn storage lane lengths should be reduced in favour of medians, as they give the appearance of a vast roadway cross-section which contributes to higher driving speeds.
- ◆ An extruded asphalt curb should be constructed along the south side of the roadway to give separation from the travel lanes to pedestrians.
- ◆ 1.8m bike lanes should be marked along the entire corridor.
- ◆ Construct small raised medians either side of the Eagle View driveway to prevent drivers from overtaking in this area.
- ◆ Construct a student pick-up / drop-off area on the west side of the Eagle View school driveway to ease congestion in the school parking lot.
- ◆ Relocate the westbound bus pull-out west of future driveway location.

The intersection of Burnside Road West and Watkiss Way will require signalization when development occurs on adjacent parcels. An interim laning plan has been developed for the intersection to improve safety. The plan calls for the elimination of the second northbound receiving lane and the dedication of an exclusive right turn lane approaching the intersection from the south. The corner radii are to be reduced to 12m on all legs of the intersection to reduce speeds and minimize pedestrian exposure and crossing time.

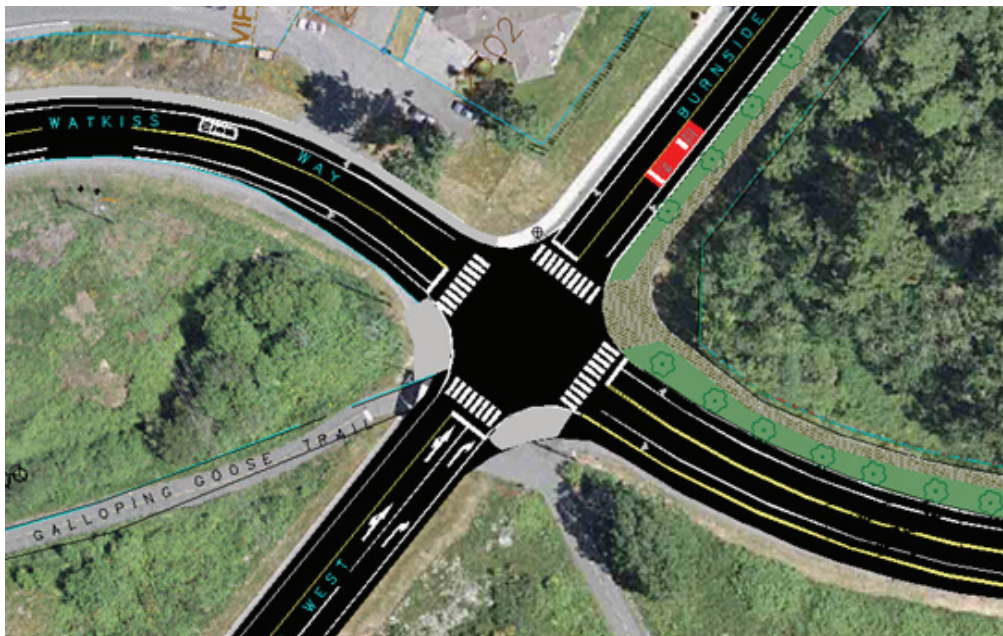
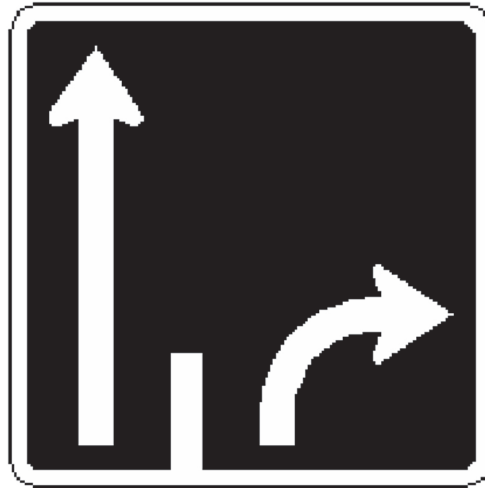


Figure 23 - Watkiss Way / Burnside Road West Intersection

collector roads

Atkins Road

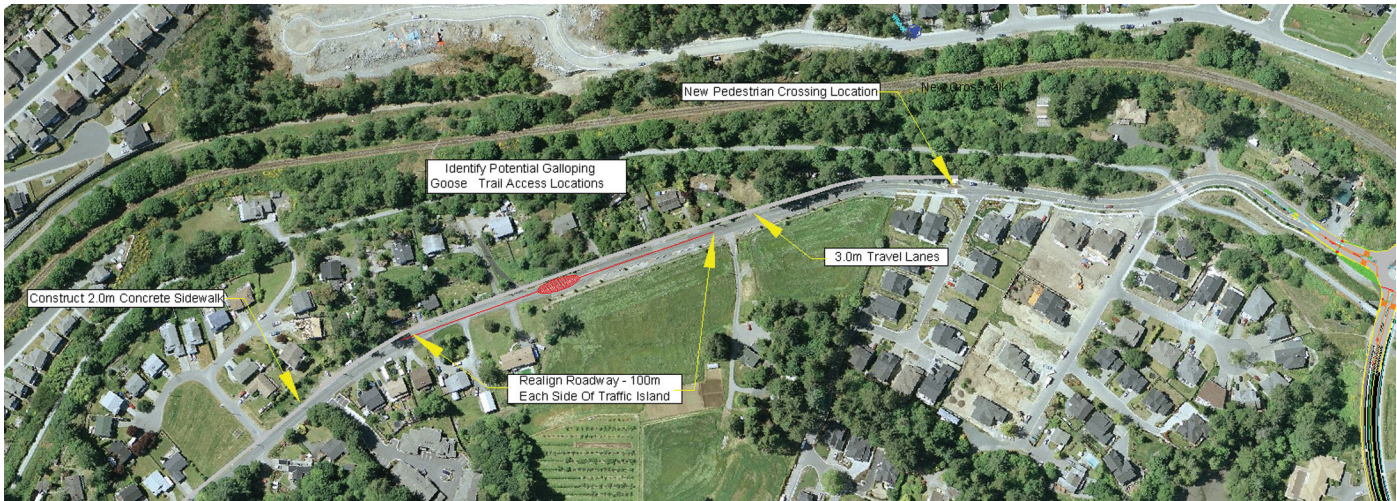


Figure 24 - Atkins Road

- ◇ Construct 2.0m sidewalk on north side
- ◇ New crosswalk application
- ◇ Realign road section
- ◇ 3.0m travel lanes



As Atkins Road runs parallel to the Galloping Goose Trail, consideration has not been given to marked bike lanes at this location. The majority of this section of roadway has no facilities for pedestrians.

- ◆ The town has recently outfitted Atkins Road with additional traffic calming devices in the form of speed humps. These applications should be monitored for effectiveness and determination if additional measures are required.
- ◆ A 2.0m sidewalk should be constructed on the north side of the roadway.
- ◆ A new Atkins Road crosswalk should be marked immediately west Anya Lane. The existing median should be retrofitted to serve as a refuge island.
- ◆ A traffic island exists at 164 Atkins Road. Given the poor alignment of the roadway associated with it, we recommend that either the island be removed or the approaches on either side be realigned.
- ◆ It is recommended that public additional public access to the Galloping Goose Regional Trail be identified along the portion of Atkins Road near the municipal border.

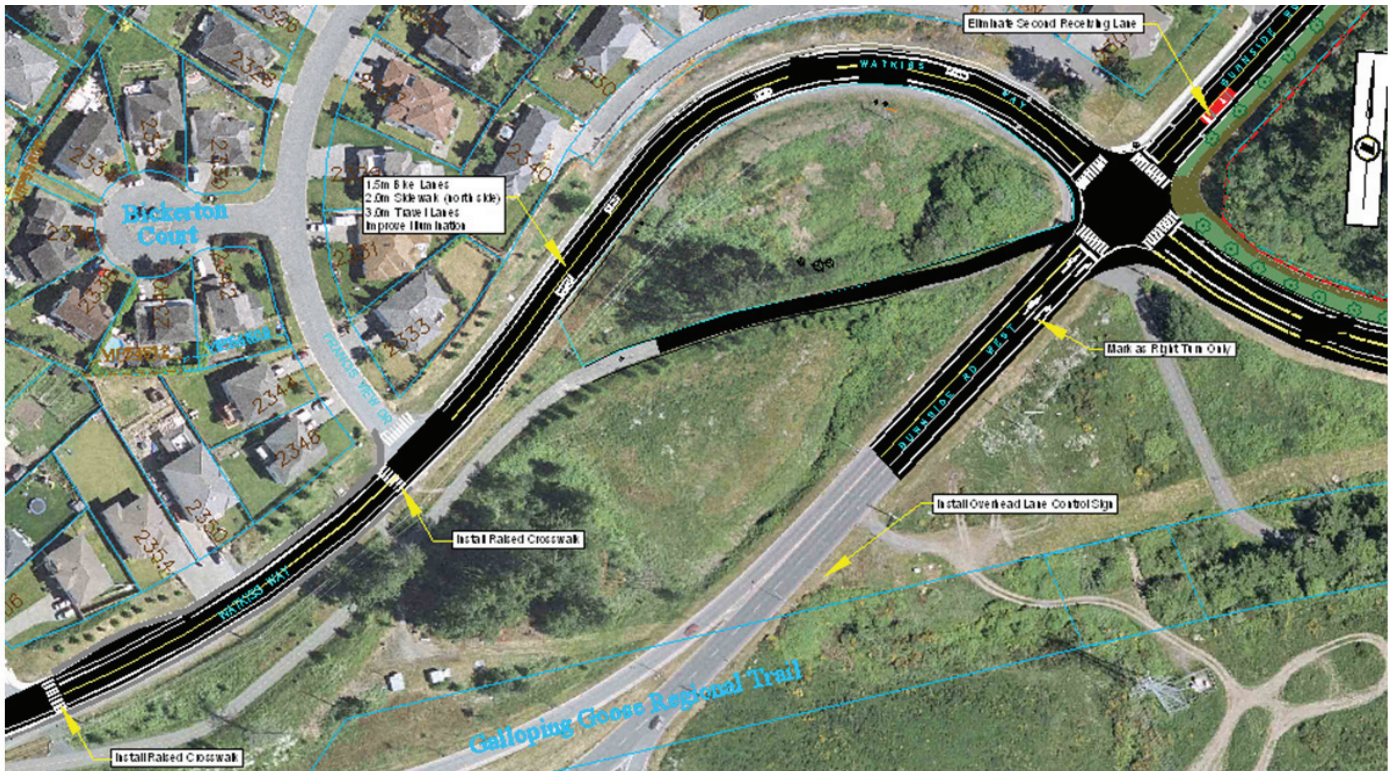
Watkiss Way

Figure 25 - Watkiss Way – West of Burnside

- ◇ 3.0m travel lanes
 - ◇ 2.0m sidewalk on north side
 - ◇ 1.5m bike lanes
 - ◇ Install raised crosswalks at Creed Road and Francis View Drive
 - ◇ Improve illumination
-
- ◆ 3.0m vehicle travel lanes are recommended here for traffic calming.
 - ◆ A 1.5m sidewalk should be constructed on the north side of the roadway.
 - ◆ As this section of road serves as a recreational bicycle route, it should be treated with 1.5m min. marked bike lanes.
 - ◆ Raised crosswalks should be installed on Watkiss Way at Creed Road and Francis View Road with access trails connecting to the Galloping Goose Trail.
 - ◆ Low level pedestrian lighting should be installed along the roadway, particularly near pedestrian crossing locations.

Burnside Road West

The portion of Burnside Road West from Watkiss Way to the Saanich municipal border is a two-lane cross-section with a curvilinear alignment. There are no sidewalks or bicycle lanes on this portion of the route which is rural in nature.

It is occasionally used as a crossing location for school children going to and from Eagle View Elementary School but the alignment of the road limits drivers' sight distance in the vicinity of the school. The pedestrian crossing location on the north leg of the Watkiss Way / Burnside Road West intersection is the appropriate crossing route and a signal has been recommended for this location.

If development along this route occurs, it is recommended that the provision of sidewalks and bicycle lanes be required as a condition of approval.

Helmcken Road

The portion of Helmcken Road between View Royal Avenue and Island Highway is classified as a collector road. It is recommended that the existing traffic circle at the intersection of Helmcken Road / Bessborough intersection be removed.

While intended to be a traffic calming device, the traffic circle at Helmcken Road / Bessborough Avenue was designed in such a way that some oversize vehicles cannot navigate its tight radius. Vehicles from View Royal Avenue, approaching Helmcken Road were observed re-routing to Bessborough Avenue and turning through the traffic circle in the opposite direction to avoid the restrictive radius.

View Royal Avenue

Some minor widening is recommended along the eastern sections of View Royal Avenue. A minimum pavement width of 6.0m is desirable. Due to the hilly terrain here, sight distance is compromised along this same section of road in places and should be re-graded.

Given the current land-use, View Royal Avenue experiences low traffic volumes and therefore will function well as a shared use roadway. The application of 'Sharrow' markings is recommended.

local roads

Jedburgh Road

Jedburgh Road is a natural short-cut route around the Island Highway / Helmcken Road intersection. Some traffic calming measures should be considered to discourage this action and to ensure traffic speeds are controlled. The right-in / right-out only at Island Highway should be maintained.



Figure 26 - Jedburgh Road

special roads

There are three local roads in the Town of View Royal which have been designated as having special functions within the Town. A brief description of why they have been so designated and recommended improvements is provided in the following sections.

Hallowell Road

Hallowell Road provides a connection between the proposed E&N Rail Trail and the major road corridor of Admirals Road with its concentration of commercial and retail land uses.



Figure 27 - Hallowell Road

- ◇ 3.3m travel lanes
 - ◇ 2.0m sidewalk on south side
 - ◇ 2.0m boulevard on south side
 - ◇ 1.8m bike lanes
- ◆ Low level pedestrian lighting should be installed along the roadway.
 - ◆ 1.8m marked bike lanes
 - ◆ It is recommended that Hallowell Road be designated as a 'Bicycle Route' as this will form an important connection between the E&N Rail Trail and the commercial areas along this section of Admirals Road.
 - ◆ This area is a candidate as a potential future rail station location making alternate mode facilities critical here.
 - ◆ Restrict on-street parking.

Kislingbury Lane

Similarly Kislingbury Lane is the proposed route for connecting the Rail Trail to the Island Highway in order to provide continuity across the Island Highway and Burnside Road West and not constructing an overpass parallel to the TCH for the Rail Trail.

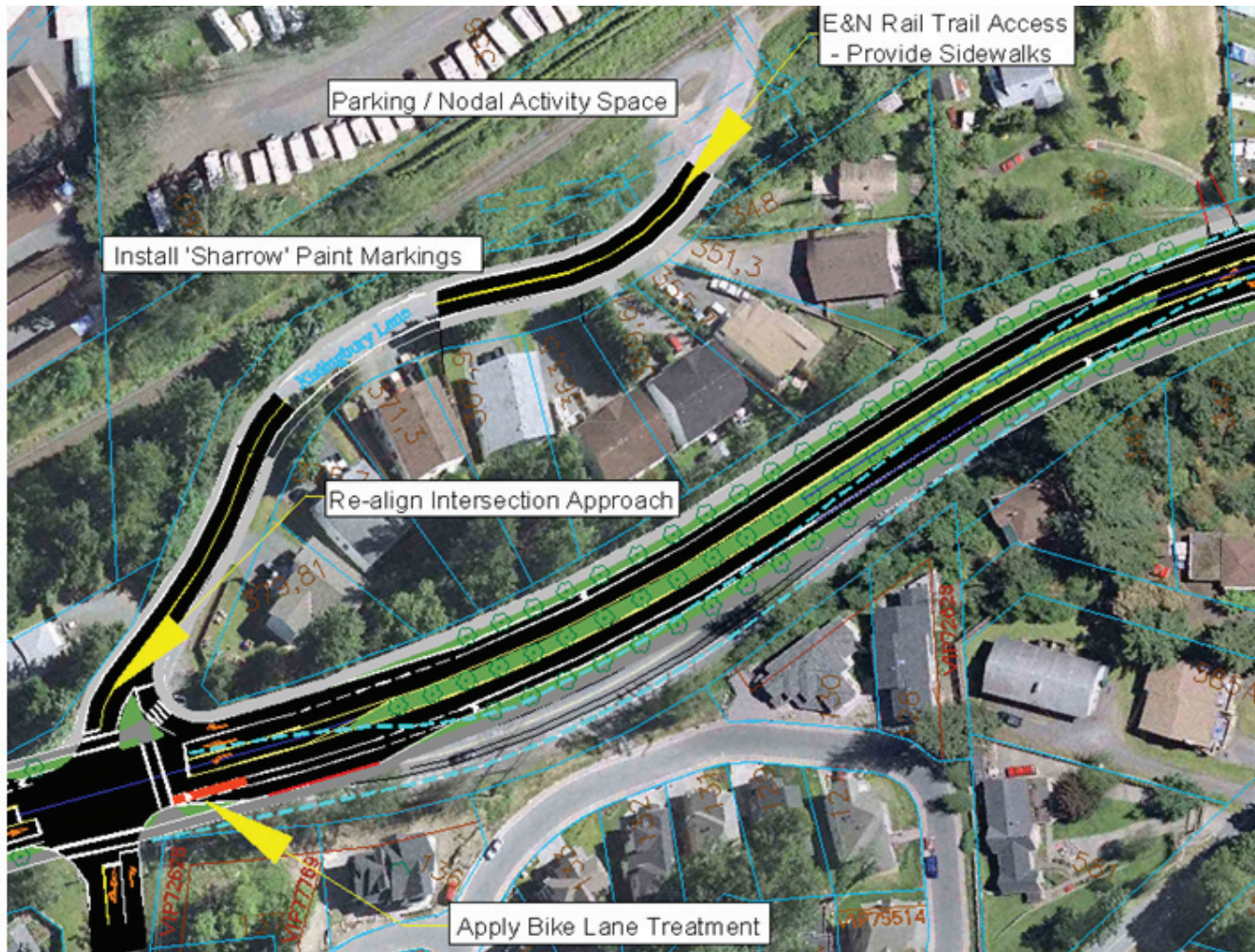


Figure 28 - Kislingbury Lane

- | | |
|------------------------------------|----------------------------------|
| ◇ Realign Kislingbury approach | ◇ 2.0m sidewalks continuous |
| ◇ 'Sharrow' bike marking treatment | ◇ No on-street parking |
| | ◇ Parking / Nodal Activity Space |

- ◆ It is recommended that Kislingbury Lane be designated as a 'Bicycle Route' as this will form an important connection between the E&N Rail Trail and Island Highway.
- ◆ Realign the southbound approach to Island Highway for safer cross movements to Knollwood Road and improved sight distance.
- ◆ Provide 2.0m sidewalks on both sides.
- ◆ Develop an activity centre space adjacent the E&N Rail Trail with bike racks, street furniture, lighting, etc.
- ◆ Restrict on-street parking.

Burnside Road West

Burnside Road West provides an important connection between the portions of the Town north and south of the TCH. If it provided access in both directions it would likely be classified as a major or collector route. However it does not provide full movements at its intersection with Island Highway. As well, it does not have sidewalks or bicycle lanes as that capacity is provided in the parallel Galloping Goose Trail.

However the merge between westbound lane of the exit ramp from the TCH and Burnside Road West southbound lane presents a conflict for vehicle drivers. Due to the angle of approach it is difficult for either driver to be aware of the presence of a vehicle in the other lane. It is recommended that the second WB exit lane be removed so that there is only one WB exit lane from the TCH.

7

transportation management overview

The development of transportation plans is evolving from a historical focus on providing capacity for road based transportation modes to an increased emphasis on sustainable transportation planning. The principles for sustainable transportation planning, as articulated by Transport Canada¹ and the Transportation Association of Canada² were referenced as guidelines for this particular project. The twelve principles are summarized in Appendix A and can be grouped into two categories or themes as described by Transport Canada – the first grouping referring to outcomes and the second to process.

These principles are reiterated here and provide the framework for illustrating how the Town of View Royal is responding to these principles with their Transportation Master Plan which is one strategy underpinning their vision for their community which was articulated in the current Official Community Plan as being:

“a quiet traditional “small town” residential community with a modest rate of growth. It is made up of sustainable neighbourhoods that are desirable places to live – convenient, walkable, attractive, affordable and safe. These neighbourhoods will be self-sufficient in many respects and be connected to one another through greenspace corridors and pedestrian/cyclist-friendly streets. The impact of major transportation corridors that pass through View Royal will be minimized,”



¹ “Strategies For Sustainable Transportation Planning: A Review of Practices and Options”, Transport Canada, September 2005.

² “Strategies for Sustainable Transportation Planning”, Preliminary Draft Briefing, Transportation Association of Canada, April 2006.

7.1 sustainable communities & transportation systems

Principle 1 Integrate Transportation and Land Use Planning

That transportation planning needs to be done in conjunction with land use planning seems obvious due to the impact each activity has on the other. Typically land use planning is incorporated in the Official Community Plan (OCP) of which the transportation plan is an integral component. In this particular instance the Transportation Master Plan (TMP) is using the existing OCP and Zoning Bylaws to develop rapid and slow growth scenarios for the community. Concurrently the OCP is being updated and when complete, the TMP will be incorporated into the OCP. Subsequently the OCP and TMP will be updated on a regular basis to ensure that the two are consistent and reflect the symbiotic relationship of the two processes.

Accompanying the need for coordination between land use planning and transportation planning, are supportive policies for desirable land use form and design. Historically OCPs have envisioned the single family dwelling unit as the most desirable residential unit within a community. The current View Royal OCP is more socially aware and relevant to today's issues. It states that "excessive reliance on motorized vehicles and consumption of valuable land resources will no longer be appropriate in View Royal. Compact housing at low to medium densities will increase housing choice and use less land than traditional forms of detached housing, while still retaining the positive attributes of small town living. Alternatives to car travel will be encouraged."

An impediment in the achievement of this vision is the amount of vehicular movements on the Town's routes that are generated from other communities within the region. To be successful, View Royal's vision must be shared. This places more importance on the need for CRD member communities to make these same principles, which are the framework for the Regional Growth Strategy, a living and dynamic reality within their communities so that all will benefit from a comprehensive and consistent approach to transportation and land use planning.

Principle 2 Protect Environmental Health

This area is becoming more important as the relationship between transportation activity, quality of life and health issues is demonstrated. Physical factors such as obesity from a lack of physical activity to the increased pressures on our health care systems due to pollution caused by transportation activities are all negative consequences of a lack of sustainability being incorporated into transportation and land use planning.

An example how the Town of View Royal is being proactive in this area is the proposed changes to the section of the Island Highway between Admirals Road and Helmcken Road which was the highest rated road project within the CRD and demonstrated significant reductions in emissions as well as water quality improvements ³.

³ IF and GSPF applications IF24031, IF24032, GSPF22049 and GSPF 22050, request for additional information

Compact housing at low to medium densities will increase housing choice and use less land than traditional forms of detached housing, while still retaining the positive attributes of small town living.

Under the Gas Tax Agreement, application was made to the General Strategic Priorities Fund (GSPF) and Innovations Fund (IF) for capital works on various proposed capital projects within the community. For the above project, the information included in the application related to greenhouse gas emission reductions and storm water quality is shown below.

GREENHOUSE GAS EMISSION REDUCTION

Emission Reduction due to Reduced Delay

This section of roadway experiences severe delays which backup onto other roadway sections in the region. Computer modeling by Bunt and Associates indicates that significant reductions in vehicle delay in this and adjacent roadway sections could be achieved by implementing the proposed plan for this section. This modeling has indicated that the vehicle delay time (creeping traffic) would be reduced by 4.98 minutes along this and the adjacent sections (morning peak). The hourly traffic is 1300 vehicles eastbound during the morning peak and 1250 vehicles westbound during the afternoon peak flow. Each peak lasts for approximately 90 minutes. An idling vehicle burns approximately 2.2 litres of gas per hour (Univ. of Toronto), which translates into 2.36kg of CO₂ (Franz – Univ. of BC).

The anticipated GHG reduction due to reduced delay is 230 tonnes / year

$$\text{GHG} = (1300\text{V} \times 1.5\text{Hrs}) + (1250\text{V} \times 1.5\text{Hrs}) \times 5\text{Min}/60\text{Min} \times 2.36\text{Kg} / 1000\text{kg/tonne} \times 310 \text{ days / year} = 230 \text{ Tonnes / year}$$

Emission Reduction due to transfer to Cycling

Data from 2006 controller counts supplemented by manual counts by Bunt and Associates Engineering shows the following weekday vehicle counts:

$$\begin{aligned} \text{Eastbound} &= \text{Approx. 12,000 vehicles per day} \\ \text{Westbound} &= \text{Approx. 13,000 vehicles per day} \end{aligned}$$

Additional data from Halcrow showed a 12 hour count of 150 bicycles. Halcrow extrapolates this data to 200 bicycles per day. This roadway is the preferred route for several thousand commuters, including over 4000 employees of the Department of National Defense base in Esquimalt. The majority of these employees live in the military housing in Colwood. This cross-section of this roadway is characterized by a single vehicle lane in each direction with no bike lanes (except for one 100 meter section in one direction), and non-continuous asphalt sidewalks immediately adjacent to the roadway. As such, this represents a significant gap in the regional cycling and walking network along a major commuter route. It is reasonable to assume that the bicycle share along this route will exceed a 5% share once the bicycle lanes are in place. Given the total daily trips (Bunt) of 25,000 on this section, the bicycle trips are anticipated to rise from 200 (Halcrow) to 1250. This represents an increase of 525 bicycles on the road (reduction in automobiles):

$$\text{New Bicycles} = (1250 - 200) / 2 = 525$$

The anticipated GHG reduction is approximately 2250 tonnes / year

$$\begin{aligned} \text{GHG} &= 525 \text{ vehicles} \times 4.3 \text{ tonnes / vehicle / year} \\ &= 2257.50 \text{ total tonnes / year} \end{aligned}$$

Emission Reduction due to Transfer to Walking and Transit

"There certainly is information showing that most transit trips involve walking links, and that improved walkability increases walking activity" (Todd Litman). Quantifiable information on this section was difficult to obtain, and so is very roughly estimated as the equivalent of the bicycle impact:

The anticipated GHG reduction is approximately 2250 tonnes / year

$$\begin{aligned} \text{GHG} &= 525 \text{ vehicles} \times 4.3 \text{ tonnes / vehicle / year} \\ &= 2257.50 \text{ total tonnes / year} \end{aligned}$$

Total anticipated Emission Reduction

The total anticipated peak hour reductions of GHG = 2257.5 + 2257.5 + 230

= 4745 Tonnes/Year

STORM WATER QUALITY

The proposed storm water improvements consist of a combination of bioretention devices including newly constructed wetlands, bioswales and rain gardens. The new wetlands will be constructed at the points of discharge into Portage Inlet and Esquimalt Harbour. They will support native plants and will provide habitat for birds, insects and other native fauna. The bioswales and rain gardens will treat the storm water at the sources (road run-off). All of the bioretention devices are designed to remove most of the contaminants prior to discharging into Esquimalt Harbour and Portage Inlet.

Typical pollutant removal results were quoted as:

"A bioretention device is an infiltration device consisting of an excavated area that is back-filled with an engineered soil, covered with a mulch layer and planted with a diversity of woody and herbaceous vegetation. Storm water directed to the device percolates through the mulch and engineered soil, where it is treated by a variety of physical, chemical and biological processes before infiltrating into the native soil."

Typical Pollutant Removal Rates for Bioretention:

Total Suspended Solids	90% (1)
Metals (Cu, Zn, Pb)	> 95% (2)
Total Phosphorus	80% (3)
Total Kjeldahl Nitrogen	65-75% (3)
Ammonium	60-80% (3)
Organics	90% (1)
Bacteria	90% (1)

Source:

- (1) Prince George's County Department of Environmental Resources, 1993
- (2) Davis, et al., 2003.
- (3) Davis, et al., 2001. Average metal concentrations in storm water.

Principle 3 Incorporate Economic and Social Objectives

The incorporation of economic and social objectives within a strategic framework for a particular community is often an iterative process of achieving an equitable balance between the two objectives or trying to effect a cultural change from the way these objectives are currently being pursued.

The economic objective can include such components as providing access to employment and making doing business easier and less expensive. These would traditionally have been considered as being addressed through automobile/truck-based transportation solutions. However the economic objective can also include providing access to opportunities for people at a disadvantage from such factors as disabilities, low-income, recent immigrants and youth as well as the elderly. These factors require other types of solutions which require an increased emphasis on alternative modes of transportation. These alternative modes in turn can increase access for these disadvantaged groups and can also provide the infrastructure to create a modal shift from automobile-based trips to more active transportation modes with the benefits of reducing pollutants supporting a healthier life style.

This emphasis on alternative modes is consistent with the Town's vision and goals as consistently articulated by residents and representatives of the community not only in their OCP but also throughout the conduct of this study. Their view of the roads within the Town as a resource to be accessible to all of the community supports this objective and is reflected in the recommended projects for making the existing roads safer and more efficient while integrating other modes of transportation to form multi-modal transportation corridors.

Goods Movement

One other aspect of the economic objective is the ability to accommodate the movement of goods within the Town. With the predominant residential nature of the community, this objective may be in conflict with the social objectives of maintaining the neighbourhood cohesiveness and liveability as discussed below. The designated truck routes within the Town of View Royal are illustrated in Figure 29.

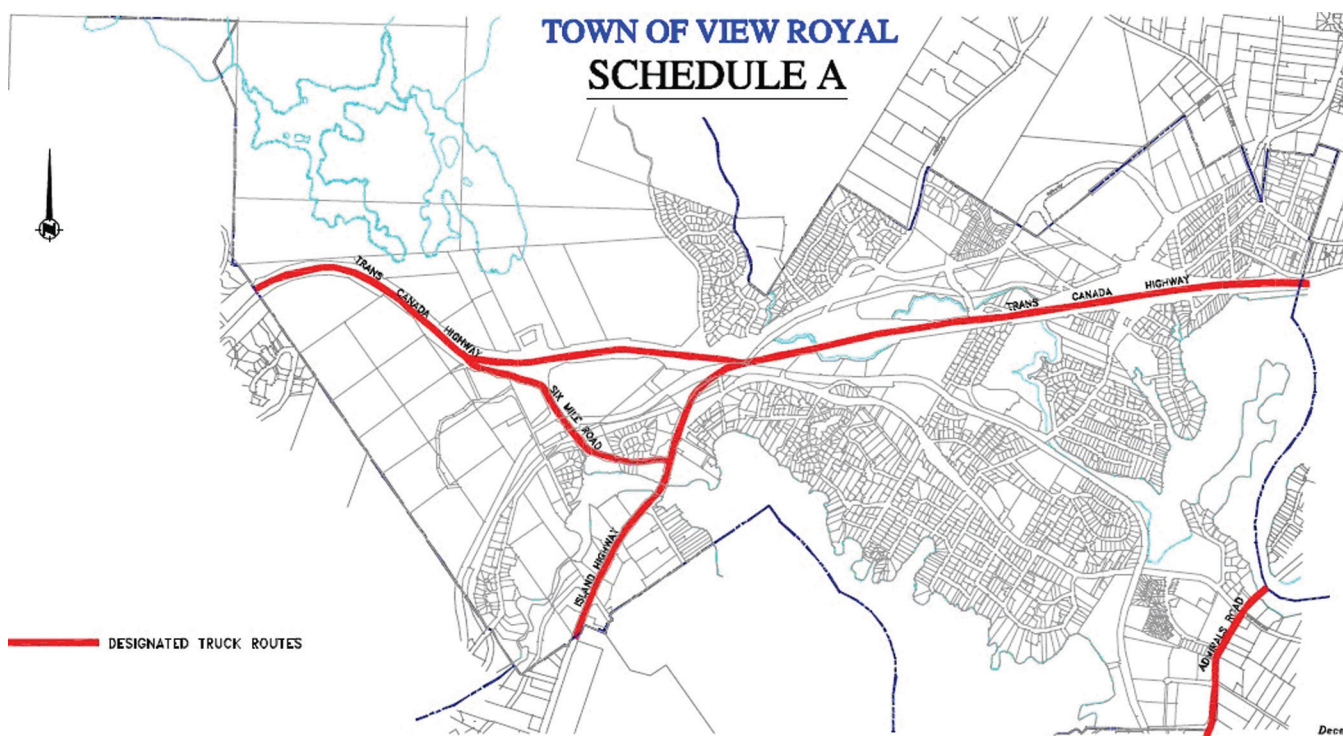


Figure 29 - Schedule A from Truck Route Bylaw

The use of heavy vehicles for the transport of goods should be limited to arterial roads within the Town. Although Helmcken Road north of Island Highway and Island Highway east of the Colwood interchange fall under this classification, the adjacent land-use is not conducive to this type of usage and therefore should not be considered for this purpose at this time.

The Island Highway within the Town is mainly residential with many driveway access locations. Additional safety concerns, along with the associated noise and vibration from truck traffic would be having a significant negative impact for residents and other road users. As redevelopment occurs along the Island Highway, it is likely that there may be a shift away from single family dwellings and toward more comprehensive development which is more sustainable. When this does occur, it may become necessary to allow certain types of heavy traffic to navigate this section for goods delivery to commercial establishments.

Although a major road, Helmcken Road south of Highway 1 should also continue to be discouraged as a truck route while the dominant land-use is residential. Another complicating factor is the location of the elementary school along this route and associated pedestrian traffic. Additionally, given the topography, excessive noise is associated with heavy vehicles both descending and climbing the hills along this route. Where truck access is required on roads not included in the truck route bylaw, trucks must use designated routes and use the shortest path to access its destination.

Another focus of the Transportation Master Plan is the provision of infrastructure for alternative modes of transportation such as sidewalks, bicycle lanes, trails and paths. Along with this increased emphasis on these modes is the need to ensure that the infrastructure is constructed to appropriate design standards. A companion document to this TMP is Working Paper #1: Technical Standards which provides documentation of relevant standards as well as illustrating where poor design has reduced use of new facilities.



Principle 4 Consider All Modes

As indicated in previous sections, not only are all modes being considered within the Transportation Master Plan, an emphasis on alternative modes is a primary focus of the plan.

The review of the existing road-related infrastructure produced the recommended road improvement projects that included the provision of bicycle lanes. As well, the increased service being provided by BC Transit to the Westshore has also been identified.

Bunt has also completed a Pedestrian Plan and Sidewalk Condition Inventory for the Town of View Royal. A conditions assessment of the existing sidewalk infrastructure was conducted, mapped and used to create a spreadsheet of the results. This project also combined inventories of sidewalks, trails and paths and identified not only gaps in the infrastructure, but also linkages to other modes such as the bicycle and road networks as well as transit stops. These linkages between networks, when combined with access to existing land use and OCP future uses provides the foundation for creating an integrated multi-modal transportation network for the Town.



Principle 5 Manage Transportation Demand

Canadian society throughout the latter half of the previous century was characterized from a transportation perspective by an auto-centric focus which manifested itself in a continuing cycle of providing additional road capacity to serve increases in population and associated automobile usage. However as pointed out in Chapter 3, starting in the 1980s there was an increasing awareness of the long term impacts of this approach which led to the recognition of the need to manage transportation demand as well as provide supply.

Transportation Demand Management (TDM) has been defined as

“a wide range of policies, programs, services and products that influence how, why, and when and where people travel to make travel behaviours more sustainable.”

The following figure, from Transport Canada, provides the context for TDM related to transportation supply management and land use.

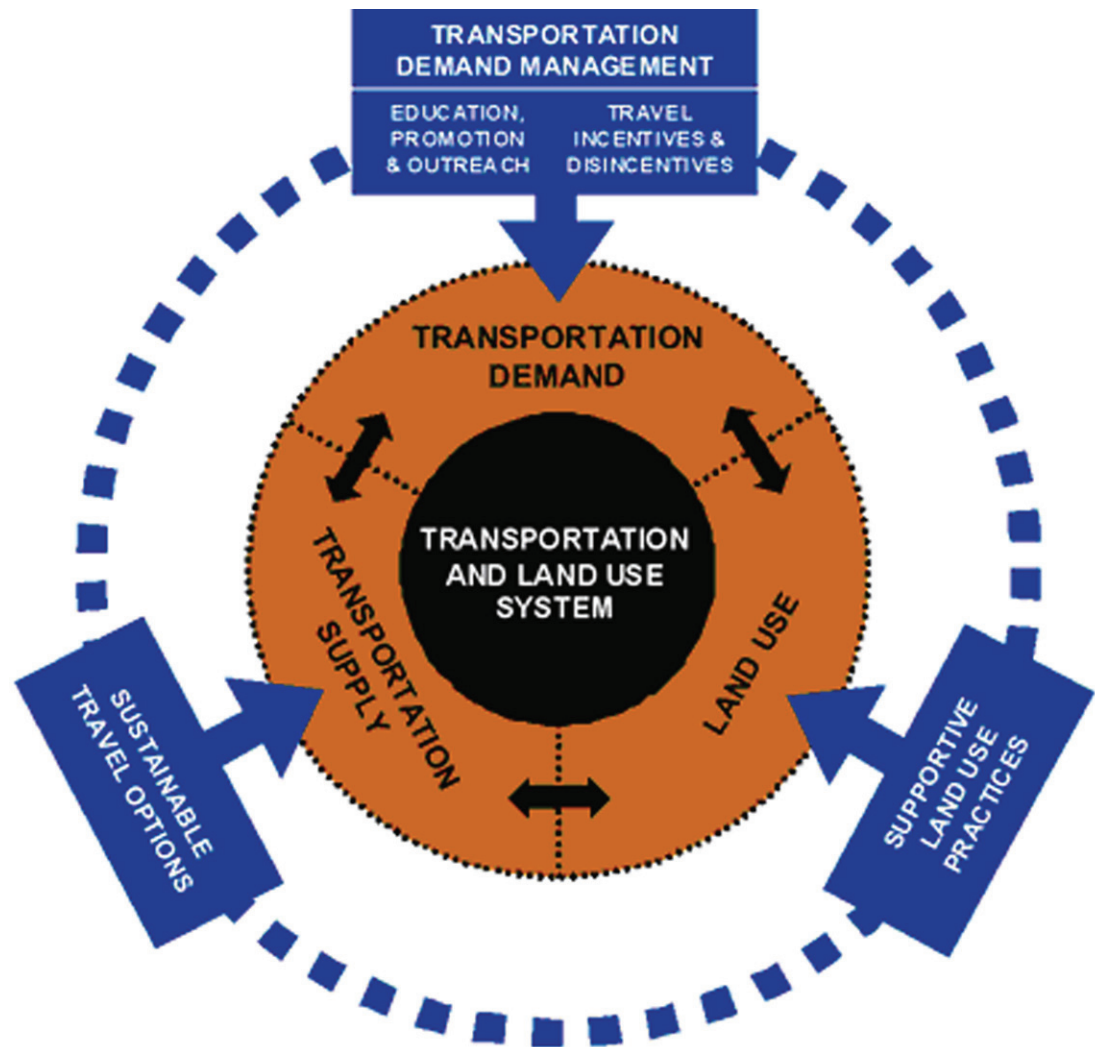


Figure 30 - Role of Transportation Demand Management

As shown, the following activities are included within the framework of mobility management:

Education, promotion and outreach

This component covers a wide range of opportunities to educate people with respect to their perceptions of different travel modes, including their individual biases, and the effects of their choices. Promotional opportunities to encourage people to try different modes and raise awareness of options plus reward leadership in this area are all options within a TDM toolkit.

An example at the national level is the Association for Commuter Transportation of Canada (ACT Canada) which was created to meet the needs of TDM professionals in Canada. It should be complemented by local level or grass roots programs to provide information within the educational environment in order to ensure that students who are either new drivers or about to become drivers are also aware of the consequences of their decisions.

Other promotional opportunities are such events as the Bike-To-Work Week which is staged annually within the CRD to encourage what is already the highest participation rate in Canada to enroll more people into this type of behaviour. The existing regional trails, the current planned E&N Rail Trail, plus the additional routes being provided at the municipal level all contribute to the building of a region-wide bicycle network.

Travel incentives and disincentives

Tangible results in terms of benefits or disbenefits related to the use of specific modes are offered to commuters. These include such programs as ridematching, guaranteed ride home programs and traveler information services. A local example would be the Jack Bell Foundation vehicle pools. Discounted transit passes are options for employers such as the Victoria General Hospital, payroll deduction transit passes for provincial government employees or providing a BC Transit pass as part of the registration fees for all students attending the University of Victoria and Camosun College.

Sustainable travel options

The components of this aspect look to shift travelers to more sustainable options. The Victoria Car Share Cooperative provides vehicles as a shared resource for members decreasing the demand for individual vehicle ownership.

BC Transit in response to increased population in the Westshore has increased frequency of service on certain routes and is also actively exploring express bus service using the Trans Canada Highway corridor. Initial stages of the bus priority system are under design within the Douglas Street corridor. The most significant progress in this area of TDM is likely to be the provision of additional infrastructure within the Town for alternative modes of transportation as well as integrating the disparate networks into a multimodal system.

Supportive land use practices

The CRD Regional Growth Strategy, as outlined in Chapter 3, provides a framework for the member communities to achieve a more sustainable transportation network with its eight strategic initiatives which include keeping urban settlement compact, managing environmental sustainability and increasing transportation choices. These are reflected in the Town's vision, goals and objectives and their response to the regional strategies are included in their OCP and their web site.

Other supportive policies can be embedded into requirements to make developments more transit-oriented as well as providing connections to adjacent sidewalks, pedestrian trails and paths. Facilities that recognize and accommodate bicycle traffic with separate and secure parking areas are also encouraged.

The Victoria Car Share Cooperative provides vehicles as a shared resource for members decreasing the demand for individual vehicle ownership.

Principle 6 Manage Transportation Supply

As mentioned earlier, it is not a sustainable approach to continue to provide capacity for automobile traffic as has been done over the past half century. In order to change the outcomes, which have been detailed in terms of effects on personal health and the environment, the supply of transportation infrastructure has to be managed.

One aspect of supply management is making the existing infrastructure safer and more efficient. The Island Highway is the most prominent example of this where the cross-section will be changed to include left turning lanes, some realignment modifications and additional signals. This will provide additional capacity by making the existing infrastructure operate more efficiently and safely. There will be minimal impact on the right-of-way and it will not negatively impact the primarily residential nature of this corridor. If the adjacent land uses change over time into commercial/retail or more dense residential use, additional right of way can be acquired for the transportation corridor. This should not be utilized for additional lanes for automobile traffic but to accommodate more sustainable transportation options such as bus priority or high occupancy lanes or other types of intermediate to high capacity modal choices. This would also be an opportunity for the Town to work toward reducing the number of direct accesses onto major roads which will improve the overall efficiency of this component of their network.

A recurring theme is also the provision of infrastructure for alternative modes such as sidewalks and bicycle lanes within the existing road corridors. Not only do these modal networks need to be integrated but their ability to provide access to major types and concentrations of land use confirmed.



The management of these assets needs to incorporate life cycle or complete costing which includes maintenance, repair, rehabilitation and renewal costs in addition to the initial capital program costs.

Other aspects of the supply which need to be managed are related to the functional classification of the roads. Access management is key when considering the functional classification of roads which address the competing needs of vehicular mobility and access to lands. Traffic calming can be used to modify the supply of infrastructure and hence demand, but it should also be noted that this technique is typically implemented on local or collector roads. Additional details on these two tools are provided in the following sections.

Access Management

Access management is defined as the systematic control of the location, spacing, design and operation of driveways, median openings, interchanges and street connections to a roadway. A number of resources provide guidance on access management and are used on a regular basis by the Canadian municipalities. One such resource is the Manual of Uniform Traffic Control Devices of Canada (MUTCDC) produced through the Transportation Association of Canada (TAC). Part B of MUTCDC contains the factors to be considered prior to installing a traffic control signal, including a warrant procedure.

The ability of arterial roads to move traffic safely and efficiently is governed by two basic factors:

- ◆ The operations at the signalized intersections of arterials; and
- ◆ The friction caused by vehicles entering and exiting the arterial roadways from unsignalized intersecting streets and property driveways. In order to optimize roadway operations, a policy is required that addresses how, where and when these two access management factors are managed in the Town of View Royal.

In considering access management policies, it is important to recognize that there is always a need to balance competing objectives. In particular, there is a significant relationship between access management and urban design objectives. In some residential areas the desire to allow homes to face the street and be accessed from the street (as opposed to reverse frontage configurations) may take precedence over access management principles. Both arterial and collector streets in View Royal have adjacent residential dwellings with frequent driveway access.



Photo: Wilfred Gibson, 1955

Traffic calming is also intended to promote increased pedestrian, cycle and transit usage in an effort to help reduce the negative effects of motor vehicles on the environment.

The application of specific types of access control measures is dependent on the type of roadway being accessed, and the type of land use generating the access need. Access management is particularly important along arterial roads where through traffic movement takes priority over access to individual properties, although access to property must still be provided either directly by appropriately located, spaced and designed driveways, or indirectly off local or collector streets that intersect with the arterials. Access management is also important on collector and local streets, but more for safety reasons than the optimization of through traffic capacity.

Assessing this transportation / land use relationship creates the need for access management. Trade-offs are often required in applying access management guidelines between the need for optimum arterial through capacity and operation, versus the localized access needs of a particular property or development. As a result, the appropriate amount of access control or restriction will differ based on the functional role of the roadway, the character of abutting land use requiring access and the Town's planning objectives along arterial corridors. Less restrictive access management guidelines may be more desirable along some roads such as commercial corridors, and this level of access management can either be based on road classifications, or on designation of specific routes for access management. In either case, an access management policy would provide an opportunity to delineate between different levels of access control on the Town's arterial network, while at the same time maintaining the predominant role of arterial roads to move through traffic safely and efficiently.

Traffic Calming

"The combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behaviour and improve conditions for non-motorized street users"

This is the definition of traffic calming developed by a Subcommittee of the Institute of Transportation Engineers in 1997. At the same time it was also recognized that traffic calming techniques were not a remedy for past mistakes in road design, but rather a response to changing desires of communities interested in providing their communities and neighbourhoods with a transportation network where road elements were multi-modal and accommodated alternative modes of transportation in a safe and effective manner.

Traffic calming is intended to improve the quality of life for residents on traffic calmed streets, achieve slower speeds for motor vehicles, and increase safety for non-motorized users of the street. Traffic calming is also intended to promote increased pedestrian, cycle and transit usage in an effort to help reduce the negative effects of motor vehicles on the environment. Due to the costs and implications associated with traffic calming proposals, requests for traffic calming should be assessed objectively. This will ensure that traffic calming is implemented in appropriate circumstances, and that streets in greater need of traffic calming receive priority for limited funding. Working Paper #2: Implementing Traffic Calming has been developed as an accompanying document to this plan.

7.2 sustainable & effective transportation planning

Principle 7 Take A Strategic Approach

With the complexity of sustainable transportation planning, the establishment of a strategic framework for planning is a key initial step which can provide guidance for planners to move from words to action as well as illustrating the reasoning and linkages between specific recommendations.

Such a strategic framework is illustrated in the Official Community Plan for the Town of View Royal which outlines the community's vision, goals and objectives as well as their six areas of commitment or values in the implementation of the OCP as described briefly in Chapter 3. The OCP also provides details on the policies relevant to the various objectives.

Within the context of sustainable transportation planning, these same components provide guidance to all participants in the process. An additional aspect would be to set what are referred to as SMART objectives. The acronym stands for Specific, Measurable, Attainable, Realistic and Timely and is useful for focusing organizations on specific aims over a period of time. This assists the organization in moving from words to work and provides a foundation that allows them to measure their progress against these objectives.

Principle 8 Provide Implementation Guidance

Transportation plans often provide strategic details. A framework is developed which consists of a stated vision, goals, objectives and the philosophy or values of the organization. However this is frequently insufficient to move from where the community is currently to their stated vision or desired future.

The previous section identified the need for SMART objectives within the context of an action plan in order to define steps needed to achieve the objectives as well as providing a basis for quantifying progress.

Other areas of guidance addressed within this TMP are:

- ◆ a procedure for evaluating the impact of future developments on the transportation network within their community;
- ◆ recommendations regarding the development of infrastructure for all modes of transportation which includes what is needed and where; and
- ◆ documentation on the topics of traffic signal warrants, cross-walk warrants, turn lane warrants and traffic calming.

This guidance is provided within the TMP which in turn will be linked to the OCP in order to integrate the transportation and land use planning activities within a sustainable context.

Principle 9 Provide Financial Guidance

While the focus of transportation and land use planning has changed to a more sustainable approach, the cost of providing the infrastructure has continued to rise. As referenced in Chapter 3, there has also been a continued devolution of responsibility to lower levels of government in most cases without the accompanying financial resources or autonomy to making the necessary decisions to service consumers and taxpayers.



For a small municipality such as the Town of View Royal, it is critical to determine alternative sources of funding as there are a myriad of grant and funding sources at the regional provincial and federal levels some of which are described in more detail in Chapter 8.

Life cycle costing of any projects needs to be determined. Grant programs typically provide capital funding but do not cover the costs required to operate, repair, rehabilitate and renew the infrastructure. Costs for other support programs such as TDM also need to be incorporated.

In the conduct of this study, order of magnitude costs have been used to assist in ranking of projects. Prior to undertaking the implementation of these projects a more comprehensive understanding of the total project costs would be required in order to allow the decision makers to make more informed decisions as to the financial implications of the various projects within their program areas.

Principle 10 Measure Performance

In describing the Town's actions under previous principles, there has been reference of the need to set SMART objectives as it provides guidance for what is to be accomplished within specific time frames. With the development of any transportation plan, it starts to become obsolete as soon as it has been approved as conditions change, action plans are refined and expected costs and revenue rise or fall.

This makes the need for performance measurement even more critical to support and inform decision makers as to the status of their plans. Progress towards qualitative and quantitative objectives needs to be identified in terms of actions taken and resources used as well as outcomes in which could be such variables as travel behaviours or congestion levels. Simultaneously external circumstances such as societal or economic shifts or changing financial positions need to be monitored to determine whether the objectives are still attainable or need to be modified.

Within the context of this TMP, there is a need for establishing baseline conditions with respect to the modal networks and then establish objectives related to them as part of the development of an action plan and creating SMART objectives.

Principle 11 Involve the Public and Key Stakeholders

The Town of View Royal is fortunate to have an informed population that wants to be engaged in the development of a transportation plan. This was amply demonstrated, not only during the Open Houses, but also the ongoing input and feedback provided throughout the course of the study.

It must be recognized that while this is an important step during the development of a plan, it remains just as critical to retain and nurture this dialogue during the implementation and follow-up of this plan.

The TMP will change over time due to a multitude of factors such as changing societal values, different local priorities, rise and fall of costs and revenues to name a few. The reason this process has been successful to this stage is the involvement of people from the public to the elected officials and staff to members of volunteer committees. The interaction was key in getting to this point – and remains key in reaching their collective vision for their community.

With the development of the TMP – and the future integration of it within the OCP – public involvement is a given. However this involvement needs to be incorporated into the implementation of planned programs and projects. The Town of View Royal already is well on the way as they advertise and invite their residents to Open Houses to discuss such matters as increased access to regional trails, consideration of proposed developments and other transportation projects impacting their community

Principle 12 Create A Living Plan

It has been mentioned that a transportation plan starts to become obsolete once approved due to a host of changing conditions. If the effort or commitment to the planning process is not there, then the plan quickly becomes obsolete as the gap between the basis for its development and current conditions rapidly widens.

Just as maintaining infrastructure retains the value of the initial capital investment, so does maintenance of a transportation plan retain the value invested in its development. It needs to have the profile and priority to be updated on a regular basis along with the OCP in order to maintain the linkage between transportation and land use planning. This needs be done cognizant of the regional context and the stated visions of the Town's neighbours.

Towards this end, it would be useful to have the Town commit to a process for regular updates which would also incorporate the involvement of public participation in the process. This would also include the development of the Local Planning Areas and their integration into the transportation and land use planning process.

7.3 summary

The Town of View Royal has made significant progress with respect to all of the principles for sustainable transportation planning outlined by Transport Canada. The Town's most significant contributions are in two areas. Firstly there is an articulate vision contained within their Official Community Plan which is supported by goals, objectives, values and policies to turn their words in work and tangible results. Secondly is the support for alternative modes of transportation which has been reflected in the recommended projects for road-based transportation contained within this document. Similar recommendations will be made for sidewalks, trails and paths when the Pedestrian Plan and Sidewalk Condition Inventory was tabled earlier this year.

There is also a commitment on the Town's part to this path as the way to turn their vision into a reality. They are an advocate for sustainable transportation and maintaining their neighbourhoods as liveable cohesive entities within their community. They have also recognized that the benefits achieved from transportation management strategies are enhanced when combined with other transportation projects and capital investments such as expanded bus transit service and trail facilities. From these beginnings, a collaborative and collegial approach to realizing the shared vision of the Regional Growth Strategy is a pragmatic and realistic SMART goal.





plan implementation and management

Implementation of the Town of View Royal Transportation Master Plan will require significant cooperation and coordination between the various implementing agencies and will involve a combination of planning, engineering, and construction activities. While construction of some of the recommended projects is critical in the near future, construction of other projects are longer term and will be needed closer to the 2026 horizon year of the plan. In either case, it should be recognized that new roadway projects require a considerable expenditure of time and money to prepare the requisite project documents and plans.

8.1 project prioritization

The projects recommended in the Transportation Master Plan must be prioritized to focus on meeting the most immediate needs first. When considering the impacts of transportation related projects, a recommended approach is to consider the projects' impacts in at least three primary areas; environmental, social or community and economic. Within these three primary areas it is also important to consider whether the projects would contribute towards survival, maintaining the quality of life or optimally improving the quality of life. The third area of consideration is the level of impact of the projects in terms of whether it is localized to the immediate vicinity of the project, a neighbourhood, a community or a province and so on to those projects with global impact. This approach provides a framework to incorporate quantitative and qualitative measures to ensure that all relevant factors and stakeholders are included in the analysis.

The level of detail of these projects at the conceptual design stage precludes an intensive analytical framework for prioritization. The following guidelines were used for this activity.

Economic

Capital costs, and maintenance costs were provided by the Town and other applicable costs were obtained from similar jurisdictions.

Environmental

This level of analysis does not support modelling of particulate emissions or nitrous oxides for example. Rather it is a subjective or qualitative judgement as to whether the various conceptual designs have a negative, neutral or positive impact on the environment.

Social Sustainability

Using a qualitative scale for the social impacts of the projects, evaluate the various conceptual designs as to whether they have a negative, neutral or positive impact on the social fabric of the community.

The consultant facilitated a workshop with a subgroup of the Transportation Advisory Committee to establish an average value for this triple bottom line analysis of the identified projects. Once this was accomplished another workshop was held in order to prioritize the projects which had been separated into projects that had a road component and those which were specifically bicycle and pedestrian oriented. The 'triangle of pairs' technique was used to help prioritize both sets of projects the results of which are illustrated in Exhibits J-1 and J-2 in Appendix J.

8.2 implementation strategies

Projects have been organized into three stages of implementation. In this way, the Town can assess the relative importance of the projects and schedule their planning, engineering, and construction as growth takes place and the need for the facilities and improvements is warranted. It also establishes a prioritization of the projects to be included in future Capital Improvement Plans.

To select projects for each of these stages, the individual characteristics of each improvement have been evaluated with regard to several alternative strategies, including reducing traffic congestion and capacity deficiencies, improving street system continuity, minimizing environmental and property impacts, protecting right-of-way opportunities, encouraging travel by non-auto modes, and encouraging development as specified in the Official Community Plan.

The first stage represents a short-range program of high-priority improvements that would be implemented first – perhaps within the first five years of the Transportation Master Plan (2007-2012). These projects were rated the highest priority by the TAC Working Committee and include:

- ◆ Bikeway and Pedestrian System Improvements on Island Highway from Helmcken Road to Shoreline Drive.
- ◆ Extension of the westbound merge lane between Admirals Road and the E&N rail overhead.
- ◆ Bikeway and Pedestrian System Improvements on Island Highway between the Colwood Border and Colwood overpass.

The ability to proceed with these projects has been enhanced with the recent funding announcement regarding the section of the Island Highway between Admirals Road and Helmcken Road.

A second series of projects, subject to changing priorities and available funding, would include:

- ◆ Realignment, Bikeway and Pedestrian System Improvements on Island Highway from Colwood overpass to Helmcken Road
- ◆ Roadway re-alignment and traffic calming on Atkins Road
- ◆ Bikeway and Pedestrian System Improvements on:
 - ◆ Admirals Road including Craigflower Bridge.
 - ◆ Six Mile Road
 - ◆ Watkiss Way
 - ◆ Helmcken Road
 - ◆ Burnside Road
 - ◆ Hallowell Road

The longer term priorities relate to planning now for accommodating alternative modes of transportation in the future.

- ◆ Acquisition of right-of-way to preserve transportation corridors for future expansion along road corridors. The Island Highway corridor is the highest priority at this time but other corridors under pressure are Admirals Road and Six Mile Road.
- ◆ Rail Station locations. Potential station locations have been identified in earlier in this report. It would seem to be a question of when these stations will be needed, not if they will be needed. These locations need to be protected from land uses which would severely compromise future rail corridors by the Town.

In order to initiate the overall implementation approach, a series of actions and decisions are needed, as follows:

- ◆ Upon receipt of the Transportation Master Plan, it is recommended that the Town of View Royal immediately integrate the TMP with the OCP review which is underway. It would be beneficial to have them combined to present a unified view of sustainable land use and transportation planning to the Town as well as the larger community. There is a unique opportunity to build on the success of the current OCP, the TMP process and acquiring funding for a key project on the Island Highway.
- ◆ The Town of View Royal and staff to continue the dialogue and developing sustainable relationships with their neighbours to inform them of the Town's progress and intentions and receive their input.
- ◆ Similarly for the Town and staff to continue to develop and enhance the dialogue with transportation departments or agencies to resolve issues and undertake projects of mutual value.
- ◆ Ensure appropriate preservation of Development Cost Charge funds for major roadworks and grant matching.
- ◆ Identification of staff person(s) within the Engineering Department to be the focal point and accountable for plan implementation and monitoring activities.
- ◆ Program short-range improvements into the next Capital Improvements Plan.
- ◆ Approve high-priority program projects, including authorization of detailed design studies for key new network facilities.
- ◆ Preserve rights-of-way for future transportation corridors. These would include projects identified in the Transportation Master Plan as long- range improvements. Such projects could include the potential LRT and Commuter Rail service station locations and potential road widening for transit priority projects or HOV lanes along the Island Highway corridor.

8.3 order of magnitude costs

Without detailed survey and sub-surface information along the study area corridors it is difficult to establish accurate costs for construction. The locations of utilities, topography, substrate conditions, etc., are all factors that can contribute to variation in construction costs. Given this constraint, order of magnitude costs have been estimated for the project areas based on the length of roadway section to be considered and unit costs for other transportation corridors in the region that have been similarly redesigned. The result is costs such as those presented in the Tables 10 and 11 for road and bicycle projects within the Town of View Royal. These are examples and the complete listing is provided in Appendix J.

Table 10: *Examples of recommended road-based projects*

TYPE	PROJECT DESCRIPTION	LOCATION	ECONOMIC (in \$1,000)	ENVIRON.	SOCIAL
Island Highway					
R/B/P	IH-7 + Parsons Bridge - cantilevered bike lanes on west side + Near Side Bus stop at Six Mile Road + Future traffic signal at Hart Road + NB LT lane may require extruded curb to prevent LTs into Six Mile Pub + RT tapers, sidewalks, bicycle lanes	Municipal Boundary to Six Mile Road	\$1,200 \$250 \$125	3	5
ROAD	IH-2 + Island Highway - Widening to extend WB thru lane past school and merge before Four Mile O/H + Inclusion of sidewalks and bicycle lanes on both sides + From O/H to View Royal Avenue, 3-lane cross-section with centre two-way left turn lane provided + Realign west approach pedestrian O/H to connect to Glentanna + Signal installation at View Royal Avenue / Island Highway	Shoreline School to View Royal Avenue	\$1,950	4	5
R/B/P	IH-3 + Island Highway - Widening to three-lane cross section to provide centre turn lane capacity for alternative modes of transportation + Inclusion of sidewalks and bicycle lanes on both sides + Create EB Rt lane on Island Highway at View Royal Avenue + Anti-skid treatment on Island Highway at View Royal Avenue + 2.0 m bike lanes for grades	View Royal Avenue to Helmcken Road	\$1,950	4	5
Admirals Road					
ROAD	AR-1 + Construction to create 5 lane cross-section with bicycle and sidewalk facilities on both sides of the travel lanes + Construct Hallowell intersection as a cross-intersection + Installation of signal at Aldersmith Place + Channelized NB RT lane + Drainage sub-project + 5 lane cross-section with sidewalks, bicycle lanes	Hallowell Road to Craigflower/Island Highway	\$1,100 \$250 \$170 \$50 \$300 \$268	3	5
Watkiss Way					
ROAD/PED	WW-1 + Intersection of Watkiss Way / Burnside + Signal warrant at intersection + Pedestrian warrant for foot traffic to school at Kami Court + Conceptual intersection design + ICBC to consider roundabout concept for intersection	Initial projects are underway and cost estimates will be available after conceptual	N/A	2	5

Table 11: *Examples of recommended bicycle-based projects*

TYPE	PROJECT DESCRIPTION		LOCATION	ECONOMIC (in \$1,000)	ENVIRON.	SOCIAL
Island Highway						
B/P	IH-1	Island Highway Four Mile Hill - railway overhead - part of rail/trail and provide capacity for maintenance vehicles + Connection to Island Highway for pedestrians and cyclists	Four Mile Hill	\$1,500	4	5
Admirals Road						
B/P	AR-3	Construction of cantilevered pedestrian / bicycle lane on east and west sides of bridge	West side of Craigflower Bridge	\$500	3	5
Rail / Trail Projects						
B/P	RT-1	Links from road to trail corridor at Kislingbury, 4 Mile Hill overpass and View Royal School at Helmcken			2	4
Camden Avenue						
B/P	CA-1	Review of intersection of Camden Way and Galloping Goose Trail		N/A	2	4
Watkiss Way						
B/P	WW-2	Watkiss Way Corridor + bike lanes and sidewalks both sides + traffic calming to reduce speeding such as roundabout at Erskine Lane, coloured or raised bicycle lanes	between Burnside Road West and Helmcken Road Investigation not completed as yet	\$832	3	5
Helmcken Road						
B/P	HR-2	Review of traffic operation and accident history + Completion of bicycle lanes in this area of Helmcken Road	South leg of Burnside / Helmcken intersection	\$25	1	4
Burnside Road West						
B/P	BRW-1	Sidewalks and bike lanes on both side	Burnside Road between Helmcken and Muncipal Border	\$388	2	4
Creed Road / Francis View Drive						
PED	CR-1	Installation of cross-walks, traffic calming measures. There was also a subsequent motion for installation of pinch points, islands and overhead lighting be installed.	Investigation and analysis not completed as yet		1	3
Six Mile Road						
B/P	SMR-2	Design bicycle lane on north side of Six Mile Road, sidewalk and bicycle lane on south side.	From Island Highway Atkins Road	\$155	2	4

The above project examples are based on an analysis of the road corridors within the Town. The analysis of alternative modes of transportation that would utilize sidewalks, trails and paths has been completed and the resulting projects will be presented to the Town in conjunction with the TMP.

The total order of magnitude costs used in the evaluation and prioritization of the projects is in the order of \$16M dollars. However due to the limitations mentioned earlier, the actual construction costs are likely to be in the range of \$40 to \$50M and reflects a significant investment in roadway, transit, bikeway, and pedestrian system improvements.

The plan attempts to achieve a balance in the use of available financial resources to increase bus transit service, expand the bikeway / pedestrian system, and improve the efficiency of the street system based on the use level of each of the various travel modes by the local travel market. It also reinforces the need for the Town to ensure that they keep the OCP and TMP current to reflect changes in internal and external conditions as they affect the vision of the community and consequently the projects that they want to undertake to move towards that vision. It also supports the need for continuing to build on successes to date to acquire additional funding from external sources to enable implementation of the projects on a timely basis.

8.4 funding sources

The burden of funding the transportation program will be incumbent upon the Town through existing local funding sources, maximization of non-local funds (such as those distributed by CRD, BC Government, Federal Government), and the private development community.

As mentioned in the discussion of the federal role in sustainable transportation planning, there has been significant criticism of the transfer of responsibilities from federal to provincial to regional to municipal levels of government. The criticism is based on transfer the responsibilities but not the autonomy or funding to support the local levels of government to effectively service their consumers and taxpayers. The response has been additional funding programs of which the Canada-British Columbia-UBCM Agreement on the Transfer of Federal Gas Tax Revenue is an example. There are other provincial programs available and opportunities at the municipal level for collecting additional funds or leveraging them through partnerships or fund matching.

A brief overview of the more prominent funding programs is provided below and relevant internet sites have been included at the beginning of this report for additional details on the program criteria, eligibility requirements and application processes.

Canada-British Columbia-UBCM Agreement on the Transfer of Federal Gas Tax Revenue [General Strategic Priorities Fund (GSPF) and Innovations Fund (IF)]

Under this agreement the Government of Canada has a five year funding commitment of \$635.6M of which \$307M is directed to the Greater Vancouver Regional District (GVRD) and its member municipalities. The remaining \$328.6M is allocated to Community Works Fund (\$190.9M), Strategic Priorities Fund (\$105.9M) and Innovations Fund (\$31.8M)

The objective of the program is to invest in eligible capacity building and public transit, community energy, water, wastewater or solid waste infrastructure projects that contribute to reduced GHG emissions, cleaner water or cleaner air. The Town of View Royal has already benefited from this program as funding for the project on the Island Highway between Admirals Road and Helmcken Road was funded for \$7.4M.

Canada-British Columbia Municipal Rural Infrastructure Fund (MRIF)

The federal, provincial and local governments are investing more than \$150 million in British Columbia for infrastructure projects under the Canada-British Columbia Municipal Rural Infrastructure Fund Agreement, officially signed on June 19, 2006. The federal and provincial governments will each contribute up to one-third or \$51 million of the total program funds. The remainder of funds will come from the local governments. Additional funding and matching contributions have raised the total to over \$220M at this time. The federal and provincial contribution towards non-green projects will each be capped at a maximum of \$1 million.

The program objective is to improve municipal and rural infrastructure with the objectives of ensuring that communities, large and small, are sustainable, competitive and healthy centres of economic growth and 80 per cent of the funding is to be committed to municipalities or regional districts having populations less than 250,000.

The application process for accessing funding under the Municipal Rural Infrastructure Fund began on October 12, 2006 and ended January 31, 2007. Applications for funding under the initial CBCMRIF are no longer accepted.

LocalMotion

The Province of British Columbia has committed to funding of \$40M over 4 years with a maximum allocation of \$1M per year to any applicant. The costs would be cost-shared 50/50 with successful applicants.

The goal is to accelerate the development of capital programs that encourage citizens to be active outdoors. This will be accomplished by supporting projects that improve physical fitness, reduce risk of traffic crashes, reduce air pollutants, and meet diverse needs of seniors, young families and all British Columbians. Examples of eligible projects would be bike paths, walkways, greenways and projects to improve accessibility for people with disabilities.

Cycling Infrastructure Partnerships Program

Another provincial program is the Cycling Infrastructure Partnerships Program (CIPP) administered by the Ministry of Transportation. It is also cost-shared 50/50 and has a limit of up to \$250K for each municipality.

It is a modal specific program which its goal being to promote transportation cycling as a means of reducing traffic congestion and green house gas (GHG) emissions.

Road Improvement Program

The Insurance Corporation of British Columbia (ICBC) analyze traffic problems and contribute money to road improvements in order to make B.C. roads safer for all users. They analyze the risk at suggested locations, working with information from the public, Ministry of Transportation, police, ICBC claims staff, municipal staff and regional ICBC loss prevention staff. Road Improvements staff review engineering studies and other information to decide which projects will be funded by ICBC.

Often, ICBC funds part of a project, working with one of the other community bodies responsible for it, such as the municipal or provincial government. All ICBC funded road improvement projects must achieve a set criteria for returns on investment. In 2006, ICBC contributed approximately \$7.5 million to road improvement projects, with the remainder provided by provincial and local road authorities.

The program objective is to improve municipal and rural infrastructure with the objectives of ensuring that communities, large and small, are sustainable, competitive and healthy centres of economic growth

One other area where ICBC can assist municipalities in specialized consultant expertise. The Town of View Royal is currently having ICBC provide their review of not only existing roundabout installations, but also proposed locations for additional roundabouts.

Municipal Funding Options

Development costs charges are a standard method for municipalities to acquire funding to utilize in infrastructure programs as required. There are also opportunities to hold these charges and leverage them with grant matching funds from other programs.

With land use changes there can also be funding acquired as grants for offsite improvements. This can apply not only to new developments but the redevelopment and rezoning applications.

There are opportunities to make joint applications for funding with neighbouring municipalities or First Nations where the transportation components are of mutual interest. As one of the smallest municipalities within the CRD, joint applications for such routes as Admirals Road and Island Highway, especially for program funding that is allocated on a per capita basis, is a practical approach.

8.5 data collection program

Through the development of this transportation plan, the Town has taken the first step in developing a transportation data collection program that can be used to assess the effectiveness of the infrastructure improvements related to all modes of transportation.

A cautionary note is the need to ensure that data collection is driven by requirements of the Town to be able to measure and evaluate progress for specified variables. From a transportation perspective, these variables would include those identified for monitoring progress of maintaining and building infrastructure and the travel making behaviours or utilization of that infrastructure.

The Town has documented their commitment to providing infrastructure for alternative modes of transportation. To make that commitment a reality, it needs to be supported by determining the current infrastructure, what infrastructure is missing, how much would it cost to implement and how much can the Town afford to do on a regular basis. This TMP and Pedestrian Plan and Sidewalk Condition Inventory are addressing the areas of documenting existing conditions, missing elements and order of magnitude costs. The Town will make the decisions on affordability and timing of their investments.

In order to report on the progress of implementation and the value or return on their investments, SMART objectives will be needed. For the modal infrastructure, these objectives could include adding a certain amount of infrastructure per year. For trip making behaviours, objectives could be to increase pedestrian traffic, to increase vehicle occupancy or to reduce traffic growth by a certain percentage over a specific time period.

There are also ways of leveraging data collection activities as the Ministry of Transportation collects traffic counts and can provide signal controller data. The CRD collects traffic data, along with household surveys to coincide with Census years and conducts counts on the regional trails of foot and bicycle traffic. BC Transit also collects ridership data on a regular basis.

This information is useful in monitoring progress and determining priorities for future improvements in the transportation network. It would also support future grant applications if it can be documented that initiatives taken are consistent with program objectives such as healthier life styles, reduced GHG emissions and cleaner air and water.

While pedestrian, cyclist, and vehicle traffic counts could be conducted routinely at each signalized intersection within the Town, or alternative mode counts along pedestrian and cyclist facilities, they should only be undertaken if tied into a cohesive program linked to the Town's goals and objectives.



photo credit ~ C. Marshall



recommendations

As articulated by Transport Canada, the creation of sustainable communities and transportation systems require cohesive land-use planning and engineering principals.

The following strategies will assist the Town in moving towards the realization of its vision as documented in their OCP.

- ◆ Adoption of this plan, strategies and recommended projects as a guiding document for sustainable transportation planning which will be reviewed in conjunction with the ongoing update to the OCP;
- ◆ Continue to foster relationships with neighbouring agencies to achieve mutual consensus on future direction with respect to infrastructure consistency;
- ◆ Develop land-use bylaws that encourage mixed use, transit oriented development;
- ◆ Acquire right-of-way along road corridors as development to provide opportunities for wider rights-of-way. This is not to add additional lanes for vehicular traffic but to accommodate more sustainable options such as priority transit, HOV or intermediate and high capacity commuter options;
- ◆ Continue the development of an integrated network of alternative mode facilities;
- ◆ Work with major employers to promote TDM strategies and incentives. These employers may not be located within the Town, such as DND, but their employees use the Town's infrastructure to make their journeys to and from work;
- ◆ Work with BC Transit to improve service within and through the town;
- ◆ Mitigate the effects of automobile emissions and other pollutants through landscape and road drainage treatment improvements;
- ◆ Develop a schedule for implementation of recommended network improvements based on funding resources and priorities;
- ◆ The Town build on its success in obtaining grant funding and use it's financial resources in matching government grants for identified municipal infrastructure upgrades.

Bicycle Network

status

The review of road bicycle network has been completed and a commuter bicycle network recommended as shown in Figure 5.

Improvements have been identified and order of magnitude cost developed. The bicycle projects, as part of the road cross-section, were reviewed and prioritized as part of the road network process described above and the complete listing of the projects are contained in Appendix J.

Sidewalk Network

status

The Pedestrian Plan and Sidewalk Condition Inventory has been completed. The network has been identified, its condition evaluated and entered into a database.

The connectivity of this modal network to bus stop locations, trails and paths has been analyzed. These modal networks have also been mapped in conjunction with major land uses to ascertain the amount and type of access being provided and the opportunities for modal transfers examined.

The results of these analyses were used to determine what gaps exist in the modal networks and their priority. A listing of these projects is provided in the report Pedestrian Plan and Sidewalk Condition Inventory.

Paths, Trails

status

The trails network has been identified as part of Parks and Trails Master Plan. Data on paths was collected in conjunction with the conduct of the Pedestrian Plan and Sidewalk Condition Inventory project. As indicated in the previous section, the alternative mode networks need to be integrated. A gap analysis has been completed to identify where improvements and connectivity can be improved. Order of magnitude costs have been compiled and a program developed.

Road Network

status

Road network has been analyzed and a recommended functional classification developed as illustrated in Figure 10.

Conceptual designs have been prepared for the major roads within the community with associated order of magnitude costs. The recommended road improvements are described in Chapter 6 and contained in Appendix H.

Projects have been reviewed and prioritized in conjunction with the Transportation Advisory Committee of the Town of View Royal. The complete listing of road projects is shown in Appendix J.

Significant land uses

status

Land uses are documented in the OCP and have been mapped to the modal networks after the gap analysis, connectivity and inter-modal transfer opportunities were identified.

Sustainable Transportation Planning

status

The principles as outlined by Transport Canada, and how the Town's plans and programs respond to those principles have been documented. Additional clarity on the achievements to date and providing direction for the future will be available after the current OCP update is complete and the OCP and TMP are harmonized.

Working Papers

status

As well as providing strategic direction and guidance, there is also an opportunity to provide more operation information in terms of standards, procedures and implementation recommendations for such topics as signal warrants, cross-walk warrants, warrants for turn lanes and traffic calming. At this time, this level of detail will not be included in the TMP but rather will be documented in Working Papers. They are intended to provide a starting point in these areas and an opportunity to learn from other jurisdictions. For example, the City of Victoria is referenced in traffic calming literature as a leading example of successful implementation of community-based Neighbourhood Traffic Management Plans.

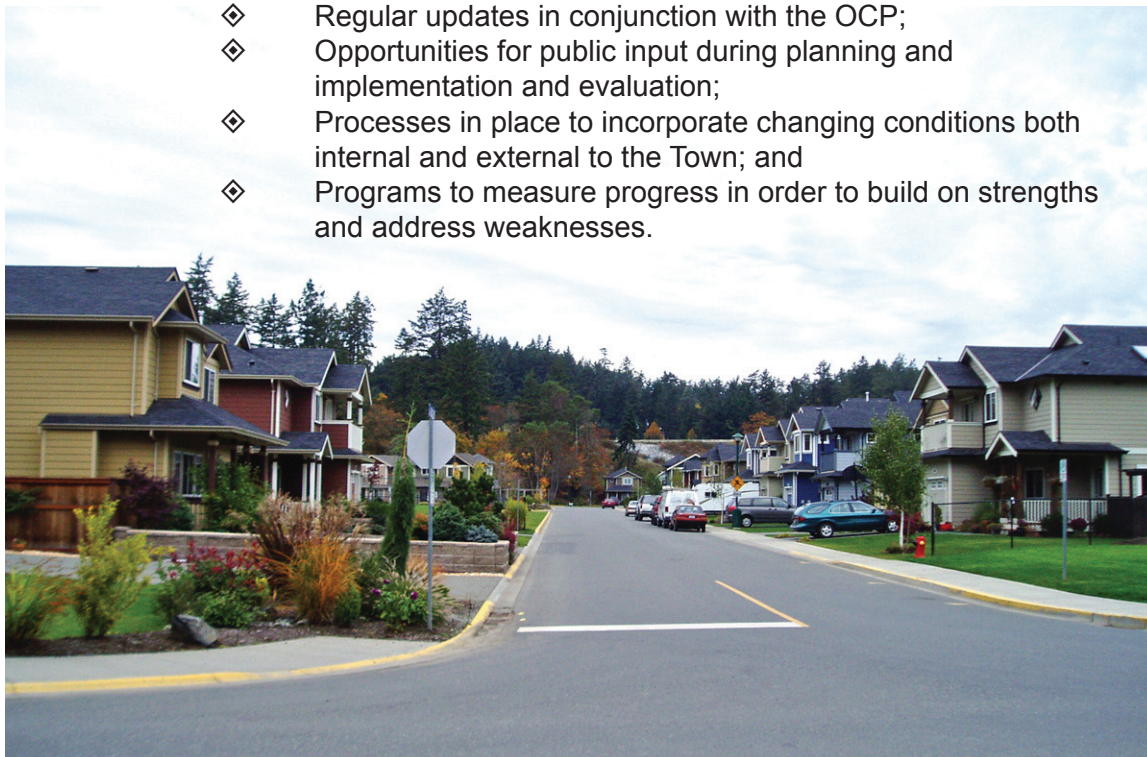
The two working papers compiled in conjunction with this project are WP#1: Technical Standards and WP#2: Implementing Traffic Calming.

Plan Management

status

In some respects the hardest part is yet to come. This TMP is a starting point and it is up to the Town to ensure that it is carried forward. This means that there needs to be:

- ◆ Regular updates in conjunction with the OCP;
- ◆ Opportunities for public input during planning and implementation and evaluation;
- ◆ Processes in place to incorporate changing conditions both internal and external to the Town; and
- ◆ Programs to measure progress in order to build on strengths and address weaknesses.



10 concluding statement

The Town of View Royal's Transportation Master Plan develops the Town's strategy to support future development within the municipal boundaries as well as external to the town. As new or updated Official Community Plans are developed, their findings and recommendations should be incorporated into this document. The plan is one step in a continuous ongoing process and the policies and strategies outlined in the plan will be continually refined over time. The efforts of all people and leaders in the Town of View Royal and adjoining municipalities are required to further improve the region and the various elements of the transportation system.

Looking toward the future, it is apparent that efforts must be made to develop a sustainable transportation system that meets the needs of the citizens of our communities. Recognition of the patterns that have been experienced to date tells us that change in human behaviour is the only thing that will allow us and our successors to enjoy the value of community along with our freedom of mobility. Without recognizing that, we will experience peak hour spreading to accommodate the habitual use of single occupant vehicles that will add to Greenhouse Gas Emissions, driver frustration, and compromised health. We could choose to provide infrastructure for the automobile in perpetuity. This could be accomplished, but at a prohibitive cost to society. There are implications that we are now realizing lead to further degradation of our lifestyles.

Society over the past few of decades has been increasingly enlightened to the ongoing effects of providing capacity for the automobile. This has led to national, provincial, regional and municipal responses as documented in this report. The larger community comprised of all citizens and stakeholders should actively pursue solutions beyond traditional methods. Full support and encouragement of alternative means of transportation that have environmental and social benefits should be implemented. Projects such as a bus priority transit system between the growing Westshore and City of Victoria, the E&N Rail Trail project, increased infrastructure to accommodate walking and cycling traffic are all building blocks towards a more sustainable transportation system. Automobile traffic will continue to be an essential mode of travel for many, but the impacts of their use should be understood as well as ways of mitigating their impact.

The Town of View Royal has stated their support for sustainable communities and transportation planning in their Official Community Plan and continue to be a staunch advocate for alternative modes of transportation including commuter rail. Through the implementation of the recommendations of this plan, the residents and businesses in the Town can be a part of the realization of their vision for their community. They can effect a shift to alternative modes of transportation and enable all of us to live healthier lifestyles.