Trans Canada Highway Corridor Management Plan
Drinkwater Road to Cowichan Bay Road

Final Draft Report

Prepared for:
City of Duncan
Cowichan Tribes Council
District of North Cowichan
Cowichan Valley Regional District
South Coast Region of the BC MoT

March 2005
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1.0 INTRODUCTION

The Trans Canada Highway serves several roles within the Duncan area ranging from the broad provincial and regional movement of vehicles, goods and services on the Island through to more localized access to individual properties. The Trans Canada Highway was originally constructed in the early 1930s. In 1958, the existing highway corridor was constructed as the bypass of Duncan. Over forty years later, this corridor is faced with many of the same issues of the original bypass at a slightly larger scale.

From a Provincial perspective, the Highway is intended to serve as an uncongested, high quality north-south route between Victoria and Nanaimo with limited delay through urban areas. Ultimately, the corridor serves the broader social and economic activity of Vancouver Island and the Province by providing access to resources, communities, provincial parks and other recreational areas. In local context the Trans Canada Highway (from Drinkwater Road to Cowichan Bay Road), in addition to accommodating through traffic, is part of a thriving and valuable commercial corridor offering key services to residents and visitors of the Duncan and Cowichan areas.

Consistent with the experiences along other urban sections of the highway in the Province, ongoing development along the corridor has resulted in a cumulative impact on the overall safety and mobility for all users of the corridor. This will ultimately serve to shorten the life of this valuable asset and at the same time accelerate the need for other costly network improvements.

The aesthetic quality and driving conditions experienced along the corridor and connecting roadways are important features that form the ‘first impression’ for many tourists travelling to and through the community.

The City of Duncan, District of North Cowichan, Cowichan Tribes Council, Cowichan Valley Regional District and the Ministry of Transportation want a strategy to address mobility, safety,
access and aesthetic issues along the Highway corridor as well as surrounding land uses and roadway networks.

1.1 Study Objectives

As identified in the Terms of Reference for this project, the study objectives are:

- Identify feasible medium-term and long-term improvements for the highway corridor to maintain or improve upon today’s level of service;
- Identify measures to maximize the visual appeal of the highway corridor;
- Advise on support network improvements adjacent to the highway corridor;
- Identify opportunities to manage access on the highway;
- Identify measures to improve pedestrian and cyclist safety within the corridor;
- Identify at a high level long-term corridor location, supporting infrastructure, and access management requirements for corridor protection; and
- Provide phasing plan to achieve long-term goal.

1.2 Corridor Goals

Consistent with the broad role and function of the TCH through the Duncan area, the goals for the corridor as an integral part of the community are equally diverse. The Terms of Reference and discussions with key agencies highlighted many of the primary goals that will be used to assess and shape solutions for the corridor. These goals are briefly highlighted in Figure 1.1 and described as follows.
Trans Canada Highway Corridor Management Plan
Drinkwater Road to Cowichan Bay Road
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Figure 1.1 - Corridor Management Plan Goals

- **Safety**
- **Mobility**
- **Affordability**
- **Alternative Modes**
- **Community/Environmental**
- **Land Use**

- **To enhance mobility for highway traffic.** For those travelling through the Duncan area on the TCH, the posted speeds change from 80 km/hr to the north and south to 50 km/h within the urban area. Additionally, travel time through the community is further influenced by a combination of the total traffic, number of signals and accesses along the highway as well as the overall number of vehicles that enter and leave the highway in the Duncan area. On the other hand, much of the local traffic circulating within the area avoids the highway as much as possible because of delays during peak periods of the day. Rather than simply allow congestion to negatively influence provincial, regional and local traffic, agencies have expressed the desire to see corridor mobility maintained and enhanced where possible.

- **To improve safety for all modes.** Because of the mixture of local, regional and provincial traffic - along with other users such as cyclists and pedestrians - as well as the corridor characteristics within the Duncan area, safety has been identified by many as a primary concern today. As such, improving safety of the corridor is recognized as an important outcome of the Corridor Management Plan.
• **To develop integrated solutions for alternative modes.** Today, the highway is generally recognized as a fairly unpleasant environment to walk or bike - whether alongside or crossing the highway. As land uses along the corridor and adjacent areas have intensified, walking and cycling activity have also increased. In support of the goals for alternative modes and the land uses that surround the corridor, solutions that address and facilitate pedestrians and cyclists should be recognized as integral parts of the strategy.

• **To ensure that strategies are integrated with surrounding land use patterns.** Many of the land uses surrounding the corridor are successful and largely well established. In a few areas, some further infill or redevelopment is anticipated over the next ten years. During this period and beyond, the highway will continue to serve an important local access and circulation function, particularly where support roadways and alternative accesses are not available. In this regard, the successful strategy will need preserve this important function either along the highway, or further expansion of the support roadway network. Additionally, corridor solutions will consider enhancements that reflect the local serving function of the highway within the study area.

• **To identify practical and affordable medium-term strategies.** Many communities expend significant time and effort in developing long-term plans which are developed based on assumptions that significant financial resources are available. Recognizing that further, large-scale improvements on the Island Highway are likely not going to happen in the medium-term, the emphasis for the Corridor Management Plan is to concentrate on those strategies and solutions that are practical and affordable over the next 10 years or so. Although the emphasis is on what can be done in the near-term, consideration will be given toward possible longer term improvement strategies where further planning could begin today.
1.3 Approach

The Corridor Management Plan is separated into five phases. The first two phases provide a complete picture of current and forecast corridor conditions without significant change to the highway or the adjacent transportation system. Phase 3 of the assignment will provide a high level review and assessment of potential long-term directions – for the next 20 to 30 years – that may be preserved in order to increase flexibility and enable further planning that may occur beyond the highway. Much of the effort and focus of the Corridor Management Plan is on medium-term improvements and potential long-term strategies that were identified and evaluated in Phase 4. Optional strategies include everything from initiatives to manage safety and mobility along the existing highway – such as access management and/or support roadways – through to upgrades to the highway and adjacent roadway system that are realistically achievable in the next 10 or so years.

Figure 1.2 - Corridor Management Plan Approach
2.0 WHERE ARE WE TODAY?

This section of the report highlights the existing conditions along the Trans Canada Highway in the Duncan area. In particular, the review considers the community context, the broader roadway network as well as the highway corridor characteristics in serving all modes of travel.

2.1 Community Overview

The City of Duncan is located approximately 50km south of Nanaimo and 60km north of Victoria. As illustrated below in Figure 2.1, the Duncan area is located midway between these regional centres with the Trans Canada Highway as the only north-south connection to Highway 17 in the south and Highway 19 in the north. In view of its location and overall highway connectivity, historical and forecast traffic on the highway is influenced by economic activity of several Vancouver Island communities – such as Nanaimo and the Capital Region – in addition to local land use patterns.

Between Drinkwater Road and Cowichan Bay Road, the Trans Canada Highway traverses through four jurisdictions - the City of Duncan, District of North Cowichan, Cowichan Indian Reserve No.1 and the Cowichan Valley Regional District (see Figure 2.2). The multi-jurisdictional nature of the corridor through this area combined with the established land use patterns makes significant change along the existing corridor challenging as experienced through the work on the Vancouver Island Highway.
Figure 2.2: Jurisdictional Boundaries

Legend

- Boundary

City of Duncan

District of North Cowichan

Cowichan Indian Reserve No. 1

C.V.R.D.

D.N.C.

Cowichan Indian Reserve No. 1

June 2004
The total population of the Cowichan Valley Regional District, including Duncan, Ladysmith, Lake Cowichan and North Cowichan was approximately 75,000 in 2002. The City of Duncan, District of North Cowichan and other portions of the Cowichan Valley Regional District (east of Lake Cowichan and north of Sooke) had a total population of slightly more than 50,000 people in 2002. This includes the population of Cowichan Tribes. In 2002, the total reported population of the Cowichan Tribes (nine reserves total) was 3,685 (Source: Registered Indian Population by Sex and Residence 2002, Indian and Northern Affairs Canada). Since 1986, the population has grown by approximately 16,000 people or 2.4% per year on average. As illustrated in Figure 2.3 below, the most significant growth occurred during the late 80s and early 90s. Since that time, the population levels within the Region have remained relatively constant, with an average growth rate of less than 1% per year.

As previously indicated, the shape of land uses surrounding the Trans Canada Highway today changes from a predominantly rural character north and south of the study area, to an established, built urban area within the core. Figure 2.4 illustrates the existing land parcels and uses along side the highway in the core study area between Cowichan Bay Road and Beverly Street. Existing and zoned uses for this area are summarized in Appendix A. As illustrated, the land parcels and existing uses are most intense between Cowichan Way and Beverly Street. Property frontages typically range from 15m to 45m between Cowichan Way and James Street and from 80m to a maximum 230m between James Street and Beverly Street. North and south of this section, the property frontages are generally more than 90m. Without sufficient support networks for alternative access and/or reciprocal access agreements between property owners, these parcel sizes often require direct access to the Highway.
Figure 2.4 (1/3) - Shared Parking Lot

LEGEND

- Shared Parking Lot
2.2 The Network

The Trans Canada Highway is a primary highway that was constructed in the early 1930s. In the late 50s, the corridor underwent various improvements that included constructing the Duncan bypass in 1958. Immediately surrounding and crossing the corridor, local roadway networks are also well established as illustrated in Figure 2.5. The roadway network consists of arterials (or majors) and collectors (or minors) as well as a local road system. In general, the east-west corridors crossing the highway are spaced at anywhere from 200m between Coronation Avenue and Truck Road to approximately 750m between Beverly Street and James Street. Each of the major intersections is controlled by traffic control signals. Many of these east-west routes are discontinuous. Further, the network parallel to the highway is very limited, with few continuous north-south alternatives to the Trans Canada Highway. Consistent with other communities where the support roadway network is limited, the lack of north-south alternatives can result in higher than average growth along the Trans Canada Highway than may be experienced in other parts of the roadway network if capacity is available.

2.3 The Highway

This section of the report highlights the primary features and conditions of the Trans Canada Highway within the study area. In particular, the lane arrangements and access configurations are described along with historical daily and peak traffic patterns and conditions.

Highway Configuration

Overall, the Trans Canada Highway is a four lane, primary highway serving north-south travel for Vancouver Island. Between Cowichan Bay Road and Drinkwater Road, the highway changes from an 80km/hr rural, divided highway in the north and south areas to a 50km/hr urban, undivided section with two-way left turn lanes in the core area. Table 2.1 summarizes the overall highway characteristics throughout the study area.
Figure 2.5: Roadway Classifications

Legend

- **Highway**
- **Arterial/Major**
- **Collector/Minor**
- **Railroad**

June 2004
### Table 2.1 - Primary Highway Characteristics

<table>
<thead>
<tr>
<th>Start (South)</th>
<th>End (North)</th>
<th>Posted Speed</th>
<th>Classification</th>
<th>Median Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cowichan Bay Road</td>
<td>Allenby Road</td>
<td>80 km/h</td>
<td>RAD</td>
<td>barrier</td>
</tr>
<tr>
<td>Allenby Road</td>
<td>Boys Road</td>
<td>60 km/h</td>
<td>RAD</td>
<td>barrier</td>
</tr>
<tr>
<td>Boys Road</td>
<td>Cowichan Way (80m north)</td>
<td>50 km/h</td>
<td>UAD</td>
<td>raised</td>
</tr>
<tr>
<td>Cowichan Way (105m north)</td>
<td>Dobson Road</td>
<td>50 km/h</td>
<td>UAU</td>
<td>TWLTL</td>
</tr>
<tr>
<td>Dobson Road</td>
<td>Coronation Avenue</td>
<td>50 km/h</td>
<td>UAD</td>
<td>raised</td>
</tr>
<tr>
<td>Coronation Avenue</td>
<td>Alexander Street</td>
<td>50 km/h</td>
<td>UAU</td>
<td>TWLTL</td>
</tr>
<tr>
<td>Alexander Street</td>
<td>York Road</td>
<td>50 km/h</td>
<td>UAU</td>
<td>painted</td>
</tr>
<tr>
<td>York Road</td>
<td>300m South Beverly Street</td>
<td>50 km/h</td>
<td>UAU</td>
<td>TWLTL</td>
</tr>
<tr>
<td>300m South Beverly Street</td>
<td>Beverley Street</td>
<td>60 km/h</td>
<td>UAU</td>
<td>TWLTL</td>
</tr>
<tr>
<td>Beverley Street</td>
<td>West Business Access (250m north of Beverly St)</td>
<td>60 km/h</td>
<td>UAU</td>
<td>painted</td>
</tr>
<tr>
<td>West Business Access (250m north of Beverly St)</td>
<td>Drinkwater Road</td>
<td>80 km/h</td>
<td>RAD</td>
<td>barrier</td>
</tr>
</tbody>
</table>

Within the study area, the highway supports connections to several major roads serving the surrounding community. As illustrated in Figure 2.6, most intersections where full movement highway access is permitted are controlled by traffic signals. The spacing between these signals ranges anywhere from slightly more than 200m between Trunk Road and Coronation Avenue to as much as 2km between Beverly Street and Drinkwater Road. Signals at Allenby Road, Boys Road, Trunk Road, Cowichan Way, and James Street are co-ordinated in attempt to provide signal progression for highway through movements.

Along some sections of the Highway, the Esquimalt and Nanaimo Railway (ENR) runs parallel to the highway. In the southern portions of the study area, the ENR railway is located immediately west of the highway between Allenby Road and Miller Road. Further to the north, the railway runs immediately parallel to the highway between Green Road and Berkeley Street. In both cases, the proximity of the at-grade crossings influences the operation of the highway as well as the interconnecting roadway system.
Several properties adjacent to the highway have direct access. In some locations, frontage roads that connect with the highway at strategic locations are provided to support property access, without impacting the highway. For example, a one-way frontage road exists from north of Francis Street to Chaster Road, where the two-way operation begins through to Allenby Road. Further, a short frontage road is located on the west side of the Highway south of Boys Road.

Although direct access to the primary highway system is generally not permitted, partial and full movement accesses exist throughout much of the study area. (Access spacing is illustrated in Appendix B). This arrangement typically increases the vehicle conflicts between through and local traffic patterns, contributing toward overall safety and mobility issues. In addition to the presence of driveways, the spacing and density can also further magnify the issue. For several sections of the Trans Canada Highway, the minimum spacing between driveways is less than 10m, with a density of 25 to 45 accesses per kilometre (see Table 2.2). Although the width of the properties surrounding the corridor has influenced the spacing and density of accesses, these conditions would be typical of a collector or local road system, and would contribute significantly to mobility and safety concerns along the highway.

### Table 2.2- Access Spacing

<table>
<thead>
<tr>
<th>Number of Accesses</th>
<th>Minimum Spacing (m)</th>
<th>Maximum Spacing (m)</th>
<th>Average Spacing (m)</th>
<th>Full Access Density (access/ km)</th>
<th>Partial Access Density (access/ km)</th>
<th>Total Distance (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys to Cowichan Way</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.00</td>
<td>425</td>
</tr>
<tr>
<td>Cowichan Way to Dobson</td>
<td>6</td>
<td>5</td>
<td>84</td>
<td>25</td>
<td>26.67</td>
<td>225</td>
</tr>
<tr>
<td>Dobson to Coronation East Side (West Side)</td>
<td>7 (7)</td>
<td>3 (3)</td>
<td>58 (56)</td>
<td>30 (33)</td>
<td>21.54 (21.54)</td>
<td>325 (325)</td>
</tr>
<tr>
<td>Coronation to James</td>
<td>18</td>
<td>3</td>
<td>53</td>
<td>12</td>
<td>46.15</td>
<td>390</td>
</tr>
<tr>
<td>James to Beverly</td>
<td>5</td>
<td>33</td>
<td>322</td>
<td>118</td>
<td>6.85</td>
<td>730</td>
</tr>
</tbody>
</table>
Traffic Characteristics

This section provides highlights of the traffic characteristics and patterns within the study area. The background data described in this section of the report is provided in Appendix C.

- In 2001, the average annual daily traffic (AADT) along the Trans Canada Highway is very similar throughout the study area – with approximately 24,000 and 21,000 vehicles to the south and north respectively, and almost 27,000 within the core area near Coronation Avenue.

- Historically, traffic volumes along the highway have increased on average from 1.5% to 2.0% per year.

- Daily traffic volumes along the highway are slightly higher (less than 10% more than the AADT) during the summer months of June and July.

- During a typical weekday and weekend, the daily traffic volumes along the highway do not vary significantly, with slightly higher traffic levels on Friday.

- Weekday and weekend peak volumes are also relatively consistent, with approximately 2,500 vehicles in both directions. The primary difference is that the weekday peak occurs during the later afternoon (3 pm to 5 pm) while the weekend peak is during the midday period (10 am to 1 pm). The two way peak volume represents approximately 10% of the daily traffic volumes which is consistent with most urban areas. Figure 2.7 illustrates typical weekday and weekend twenty-four hour volume profiles.

- During the morning and afternoon peak hours, truck volumes range anywhere from 60 to 120 vehicles per hour within the study area. This accounts for approximately 5% of the corridor volumes.
Vehicle Mobility

Mobility along and crossing the Trans Canada Highway affects not only the movement of people and goods between communities on the Island, but the quality of life for the communities that surround the corridor. Intersection levels of service (LOS) provide an indication of corridor mobility as measured by delay for each of the signalized intersections along the corridor. Figure 2.8 illustrates the overall PM peak hour levels of service at each signalized intersection within the study area (as well as the delays experienced for each movement through the intersection). Generally, improvements are recommended at signalized intersections that experience LOS E or F.

As previously indicated, the signals between Allenby Road and James Street are co-ordinated to provide signal progression for highway through movements. These results indicate that the majority of signalized intersections operate at acceptable levels of service during the peak period, although some turning movements at each intersection may operate at or beyond the existing capacity. The overall performance at Trunk Road and Beverly Street is poor, with average intersection delay beyond what would be typically desirable, more than 60 seconds per vehicle. It is anticipated that the delays experienced at the major intersections are further impacted by the spacing and density of accesses along much of the highway corridor.
Figure 2.8: Existing PM Signalized Intersection Level of Service (2004)
The results indicate that overall operation at full movement unsignalized intersections varies throughout the corridor, depending upon traffic volumes on the crossing roads. Crossing road movements generally operate poorly, with failing levels of service (due to delay). Although current overall operation at unsignalized intersections outside the City is good (i.e. Cowichan Bay Road), increases in crossing road volumes will deteriorate intersection performance as the number of available gaps on the highway remains limited.

Another indicator of highway corridor performance is the overall travel time, or average travel speed. Although the goal is not to maximize speeds, actual travel times/speeds today and in future are compared with posted speeds to gauge mobility. Table 2.3 below summarizes the existing posted speed and actual average travel speeds recorded along the highway during peak study periods. The minimum desirable average travel speeds have been identified by the Ministry for other highway corridors in the province for comparative purposes.

<table>
<thead>
<tr>
<th>Section</th>
<th>Posted Speed</th>
<th>Avg Speed Observed &amp; Simulated</th>
<th>Minimum Desirable Avg Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cowichan Bay Road to Allenby Road</td>
<td>80 km/hr</td>
<td>65 km/h</td>
<td>75 - 80 km/h</td>
</tr>
<tr>
<td>Allenby Road to Trunk Road</td>
<td>50/60 km/hr</td>
<td>50 km/h</td>
<td>30 km/h</td>
</tr>
<tr>
<td>Trunk Road to Beverly Street</td>
<td>50/60 km/hr</td>
<td>32 km/h</td>
<td>30 km/h</td>
</tr>
<tr>
<td>Beverly Street to Drinkwater Road</td>
<td>60 / 80 km/hr</td>
<td>45 km/h</td>
<td>65 km/h</td>
</tr>
</tbody>
</table>

These results indicate that overall average travel speeds are well below the posted speeds as expected and within a reasonable range of the minimum average speeds used on other parts of the province, considering the north and south areas are transitioning to and from a 50km/hr speed zone. This information also indicates that the total travel time through Duncan from Cowichan Bay Road through to Drinkwater is approximately 7 minutes during off-peak periods, and 10 minutes in the peak.

**Safety**

Corridor safety typically influences all modes of travel. The Ministry of Transportation collision records from the police provide an overview of the vehicle collision patterns along the highway for the purpose of gauging corridor safety and identifying any specific problem areas. The following discussion highlights the primary patterns from reported collisions between 1998 and 2002. Appendix D provides further detail on the summary of collision patterns. It should be recognized that these patterns do not include all collisions as the police do not generally respond to minor collisions.
• Approximately 366 collisions were reported between Cowichan Bay Road and Drinkwater, or 73 per year.

• As expected, a large majority of the collisions occurred at the major intersections of Beverly Street, James Street, Coronations Avenue, Trunk Road, Boys Road and Allenby Road.

• Mid-block areas between intersections account for approximately 30% of the total collisions (Figure 2.9).

**Figure 2.9 - Distribution of Collisions by Location Type**

- Over 60% of the collisions were classified as either rear-ends, left turns or intersection 90 degree collisions.

- Collision rates exceed the provincial averages for similar facilities throughout much of the study area (Figure 2.10).

- With the exception of the section between Beverly Street and Drinkwater Road, the severity of collisions is generally below the provincial averages for much of the highway. This northern section of highway is currently under construction to provide signalization at Drinkwater Road. The section of highway immediately south of Beverly Street is under construction to provide two-way left turn lane between James Street and Beverly Street.
Walking and Cycling

Walking and cycling activity along and crossing the Trans Canada Highway corridor is growing, likely a result of increase in development on both sides of the highway. Considering the growing demands along with the volume and type of traffic using the highway and the number of driveways that access the corridor, pedestrians and cyclists generally experience a challenging and unattractive environment. An explicit goal of the Corridor Management Plan is to create a safer and more attractive environment for pedestrians in key areas along and crossing the corridor as well as support planned bicycle facilities. The following discussion highlights some of the existing conditions experienced by pedestrians and cyclists.
• Sidewalks are provided on both sides of the highway for much of the corridor. As summarized in Table 2.4, although there are no gaps in the sidewalk from south of Beverly Street to Boys Road, a 1.0m wide sidewalk without boulevard is provided between McDonalds and James Street on the east side of the highway.

Table 2.4 - Existing Sidewalk Inventory

<table>
<thead>
<tr>
<th>Section (Side of Highway)</th>
<th>East Side</th>
<th>West Side</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boulevard Width (m)</td>
<td>Sidewalk Width (m)</td>
</tr>
<tr>
<td>Beverly Street to Tim Horton’s (E)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Tim Horton’s (E) to McDonalds (E)</td>
<td>5</td>
<td>1.7</td>
</tr>
<tr>
<td>McDonalds (E) to Pizza Hut (W)</td>
<td>0</td>
<td>1.0</td>
</tr>
<tr>
<td>Pizza Hut (W) to Empty Lot (W)</td>
<td>0</td>
<td>1.0</td>
</tr>
<tr>
<td>Empty Lot (W) to James Street</td>
<td>0</td>
<td>1.0</td>
</tr>
<tr>
<td>James Street to Alexander (E)</td>
<td>0</td>
<td>1.7</td>
</tr>
<tr>
<td>Alexander (E) to Duncan Realty (W)</td>
<td>3.5</td>
<td>1.7</td>
</tr>
<tr>
<td>Duncan Realty (W) to Coronation Ave</td>
<td>3.5</td>
<td>1.7</td>
</tr>
<tr>
<td>Coronation Ave to Robertson (W)</td>
<td>2</td>
<td>1.7</td>
</tr>
<tr>
<td>Robertson (W) to Trunk Road</td>
<td>2</td>
<td>1.7</td>
</tr>
<tr>
<td>Trunk Road to Good Company (E)</td>
<td>0</td>
<td>3.5</td>
</tr>
<tr>
<td>Good Company (E) to Dobson (E)</td>
<td>2</td>
<td>1.5</td>
</tr>
<tr>
<td>Dobson (E) to Boys Road</td>
<td>0</td>
<td>1.7</td>
</tr>
</tbody>
</table>

• The existing sidewalk width of 1.7m or less without any buffer area between the highway for much of the study area significantly reduces the comfort and safety of cyclists along the corridor.

• “Walking areas” along some sidewalks are restricted to accommodate signage and utilities.

• There are no raised median islands along the corridor and at signalized intersections sufficient to provide refuge for pedestrians or cyclists wishing to cross the highway. Any existing raised median islands are approximately 1m wide. Figure 2.11 illustrates the existing median island at Trunk Road.
There are no raised median islands along the side streets that provide refuge for pedestrians or cyclists crossing walking along the highway. Refuge is, however, provided by right-turn channelization islands as shown below right (at James Street).

Pedestrian activity along and crossing the highway is highest in the areas of Coronation Avenue and Trunk Road as illustrated in Figure 2.12 where approximately 30 to 50 pedestrians are reported to use the intersection crosswalks (along and crossing the highway) during the afternoon peak hour.
Figure 2.12: PM Peak Hour Pedestrian Activity at Intersections

Legend

- 5 Pedestrians
3.0 WHERE ARE WE GOING?

This section of the report examines those factors that influence demands on the Trans Canada Highway, and reviews anticipated long-term levels of mobility without any change in the highway or local road systems. The broad strategies to address existing and future potential issues and achieve the corridor goals examined in Section 4 of the report.

3.1 The Future Without Major Improvements

Over the next 10 to 20 years, population growth and land use changes in the Duncan area, and increased economic activity and demographic change in other parts of Vancouver Island will contribute toward increased travel demands for all modes along and crossing the Trans Canada Highway. In addition, local roadway network improvements can also serve to support at least a share of the increased traffic – particularly local serving trips. This section briefly highlights those anticipated growth patterns and planned local network improvements in communities surrounding the Trans Canada Highway.

Growth and Development

Although most of the land uses surrounding the core area of the corridor are well established, the following key observations are made regarding future change in population as well as growth in traffic generated within the broader Duncan area.

- Over the last 10 years, annual population growth throughout Vancouver Island has been slightly less that 1% per year, while at approximately 1.3% for Duncan, Cowichan Valley Regional District and the District of North Cowichan. According to BC Stats, these rates of growth are not projected to change significantly over the next 20 years.

<table>
<thead>
<tr>
<th></th>
<th>Annual Growth (%/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Historical (10 yrs)</td>
</tr>
<tr>
<td>Duncan/CVRD/DNC</td>
<td>1.3%</td>
</tr>
<tr>
<td>Vancouver Island</td>
<td>0.9%</td>
</tr>
<tr>
<td></td>
<td>Forecast (20 yrs)</td>
</tr>
<tr>
<td>Duncan/CVRD/DNC</td>
<td>1.1%</td>
</tr>
<tr>
<td>Vancouver Island</td>
<td>0.9%</td>
</tr>
</tbody>
</table>

Source: Population Section, BC Stats, Ministry of Management Services, Government of BC

- The rate of historical growth identified by BC Stats is consistent with the historical change in traffic volumes along the Highway which has been less than 1% per year.
- Previous transportation studies have forecast growth of approximately 2% per year for the Duncan area assuming an overall population increase of less than 1% per year and the fact that there are relatively few major roads to support most of the traffic increase.
Although most land uses immediately surrounding the corridor are established, members of the Steering Committee indicated that some redevelopment is likely in the long-term, with only a few areas where short-term development is anticipated – such as the northwest corner of the highway and Drinkwater Road, between Green Road and Drinkwater Road, northeast side of Cowichan Bay Road and possibly between Allenby Road and Boys Road.

Future Transportation Related Improvements

Future transportation and land use policies and improvements surrounding the Trans Canada Highway could ultimately form part of the strategy for addressing key transportation issues along the highway. This section of the report highlights those local area plans that will have the greatest impact on the highway corridor, some of which are illustrated in Figure 3.1. Those policies and planned improvements summarized below have been identified through previous plans and reports prepared by agencies represented on the Steering Committee.

• **CVRD Cowichan-Koksilah (Electoral Area E and Part of F) OCP (1994):**
  - Trans Canada Highway maintained as restricted access highway - direct access only attainable at or opposite intersection with major local road; and,
  - No new points of access to TCH in the plan area, landscape buffer at least 30m along highway for new developments to improve safety and visual representation of the community along the TCH.

• **City of Duncan OCP (1995):**
  - Minimize direct access to the highway through development approval process;
  - Address alternate network roads around Duncan, possible extension of municipal roads through Cowichan Tribes land, possibility of one-way system for Canada Avenue / Duncan Street, diversion of westbound traffic from Trunk Road onto Coronation Avenue – to maintain highway capacity, higher mobility, accessibility and safety;
  - Complete Cairnsmore/Beverly Street connector;
  - Provide interconnected road system to Cowichan Way north to Canada Avenue and Government Street;
  - Enhance the pedestrian circulation system;
  - Incorporate bicycles as part of the transportation system;
  - Encourage enhanced operation of Cowichan Valley Regional Transit System; and
Figure 3.1 - Future Roads

Legend

- **Highway**
- **Arterial/Major**
- **Collector/Minor**
- **Railroad**

June 2004
• Land use plan – commercial east and west of highway (adjacent property) except just north of Cowichan River on east side where identified as medium density residential.

• **Cowichan Bay Settlement Plan (Electoral Area D) - 1986:**
  - Restrict and reduce the number of local or private road intersections with the TCH

• **District of North Cowichan OCP 2002:**
  - Proposed arterial roads;
    - York Road extension (east of TCH) between Beverly and Timbercrest Drive
    - Philip, Cairnsmore, Gibbins Alternatives (west of TCH) – connect Beverly Street to Cairnsmore Street
    - Maple Bay Road to TCH connection – long term alternate route (to Tzouhalem Road) from Maple Bay to TCH
  - Commercial ‘villages’ on James Street, York Road;
  - Minimize highway access points; and
  - Encourage tree planting and other landscaping along the highway corridor.

**Forecast Highway Conditions**

In 20 years from now, highway growth is anticipated to increase by approximately 50%, assuming a 2% growth per year. This will result in an increase in daily traffic to approximately 38,000 vehicles or 3,800 vehicles in both directions during the peak hour. Further, cross-street traffic is also forecast to increase at a similar rate, resulting in greater pressures on the Trans Canada Highway through the broader Duncan area. Figure 3.2 illustrates the forecast peak hour levels of service for each of the signalized intersections along the corridor.

These results clearly demonstrate that long-term growth on the corridor can not be supported by the highway as it currently exists. Each of the signalized intersections and most movements are expected to be operating at LOS F – with an average delay of greater than 60 seconds per vehicle at each intersection. Further, the total travel time through Duncan is projected to increase by 160% - from approximately 10 minutes today to approximately 25 minutes by the year 2024.

**3.2 Key Issues to be Addressed**

The discussion of existing and forecast conditions highlights several issues that guide the development of the overall improvement strategy. Table 3.2 summarizes those key issues in terms of mobility, safety, pedestrians and cyclists.
Figure 3.2: Future PM Signalized Intersection Level of Service (2024)
### Table 3.2 - Key Highway Related Issues

<table>
<thead>
<tr>
<th>Category</th>
<th>Key Issues</th>
<th>Contributing Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobility</td>
<td>Support networks</td>
<td>Few alternatives for existing and future potential land uses along corridor - side-street or rear access</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Limited continuous north-south roadways to serve inter-municipal travel</td>
</tr>
<tr>
<td>Intersection delays</td>
<td>Poor (existing) intersection levels of service at the following locations:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Trunk Road</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Beverly Street</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Significant turning movements on and off highway at most intersections</td>
</tr>
<tr>
<td>Mid-block delays</td>
<td>Access density between Coronation Avenue and James Street is extremely high</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Access spacing is very low in several areas of the corridor</td>
<td></td>
</tr>
<tr>
<td>Corridor travel times</td>
<td>Forecast growth in traffic along the Highway will increase travel times through the study area by 150%</td>
<td></td>
</tr>
<tr>
<td>Safety</td>
<td>Corridor safety levels</td>
<td>Collision rates in the urban sections of the highway are well above the provincial average</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lack of transition from expressway to urban area for through traffic likely contributing toward higher than average collision patterns</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mixture of through traffic and local traffic traveling within communities increases conflicts</td>
</tr>
<tr>
<td>Intersection safety</td>
<td>Several intersections along the corridor support highest traffic collisions:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Coronation Avenue</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Trunk Road</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• James Street</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Boys Road</td>
</tr>
</tbody>
</table>
### 3.3 Improvement Strategies to Consider

There is a range of improvement strategies that may be explored as part of the Corridor Management Plan. Some are primarily directed at managing existing facilities with key localized improvements in an attempt to maintain or increase the performance of the existing corridor. Others involve more intensive improvements that may be identified as longer term strategies that may be pursued. This section of the report highlights the broad range of improvement strategies to be discussed with the Working Committee before advancing to the next stage of review. These strategies should be considered a “menu” of initiatives to work together rather than options for consideration.
Access and Intersection Management

Management of intersections and accesses along the highway corridor generally include a range of policies and initiatives to address those mobility and safety issues previously described. The overall concept is largely concentrated on potential strategies to maintain access levels that are desirable for the specific roadway classification. For example, direct property access to highway facilities and major arterial roads is typically discouraged to protect safety and mobility of the corridor.

Although the relationships between access types, spacing and density, and resulting mobility and safety are well documented, accesses along the Trans Canada Highway within the study area have been allowed to develop. In general, these decisions are made to encourage and foster economic activity of local communities. Recognizing the existing situation, changes to these access arrangements where reasonable alternatives do not exist are typically not supportable. In other words, an integrated approach for alternative access and circulation patterns are needed as part of an overall strategy for the established areas of the corridor.

In the fringe areas of the study, intersection and access management policies and strategies are likely more supportable and achievable where municipal and provincial interests can be coordinated with property owners that wish to develop.

The range of potential access and intersection management strategies that may be explored in the Corridor Management Plan are briefly highlighted below. Additional access management strategy information is summarized in Appendix E.
Table 3.3 - Example Access & Intersection Management Techniques

<table>
<thead>
<tr>
<th>Policies</th>
<th>Design</th>
<th>Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access management guidelines or agreements with community</td>
<td>Install barrier medians</td>
<td>Frontage road systems</td>
</tr>
<tr>
<td>Supportive roadway network strategy plans</td>
<td>Install U-turns on Highway as an alternative to direct left-turn lanes</td>
<td>Rear road systems</td>
</tr>
<tr>
<td>Circulation &amp; site plan review process</td>
<td>Install “jug handles” to eliminate left turn lanes</td>
<td>Install two-way left turn lanes</td>
</tr>
<tr>
<td>Traffic signal spacing criteria</td>
<td>Right-turn deceleration &amp; acceleration lanes</td>
<td>Install left-turn bays</td>
</tr>
<tr>
<td>Unsignalized driveway spacing standards</td>
<td>Install continuous right turn lanes</td>
<td>Provide safe turning radii</td>
</tr>
<tr>
<td>Unsignalized driveway design standards</td>
<td>Channelize driveways to prohibit turning movements</td>
<td>Sufficient driveway length</td>
</tr>
<tr>
<td>Reciprocal access agreements for properties</td>
<td>Barriers to prevent uncontrolled access</td>
<td>Minimum driveway width for safety</td>
</tr>
<tr>
<td>Land use policies to maximize frontages along highway</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Intersection Improvements**

Mobility and safety issues of a corridor can be addressed through intersection improvements. In the most basic form, intersection improvement may involve *enhanced signal timing and systems* that respond to changing traffic conditions during a given day, or over several years. In some areas, intersection improvements may involve the provision of *new or additional travel lanes* to accommodate through or turning vehicles. These improvements may or may not be done in combination with *intersection turn restrictions*. Although the impacts and costs are likely more significant, consideration may also be given toward *grade-separation of intersections and/or cross-streets* to change traffic characteristics and reduce highway delays.

**Corridor Widening**

Widening of the highway between Drinkwater Road and Cowichan Bay Road from 4 to 6 lanes may be used to address issues of mobility and travel times through the study area. Although the potential impacts and costs of widening any section of the highway may be significant, recognition and discussion about this approach should occur between agencies.
Support Networks

The Trans Canada Highway is the only continuous north-south connection between Cowichan Bay Road and Drinkwater Road. As such, much of the local traffic within and between area municipal and First Nations land utilizes the highway system as the only alternative. Regardless of the highway improvement strategies, new or improved local area networks are needed to support enhanced mobility within and between local communities.

Corridor Gateways & Pedestrian Improvements

The transition between rural expressway and urban conditions is limited to the posted speed signs on the highway, along with a few other visual changes. For highway traffic wishing to travel through Duncan, the conflicts with local traffic, pedestrians and cyclists are significant impedances and a general frustration. In many cases, the transition to the urban core between Boys Road and Beverly Street are not evident and likely a contributing factor to the higher than average collision patterns through this section of the corridor. Gateway treatments that give the visual message to drivers entering the urban area of the highway are potential initiatives that could be used to influence driver behaviour.

In support of the gateway treatments, enhancements to support pedestrian and bicycle facilities in the core parts of the study area may also be considered. Enhanced crossings and buffer areas between the sidewalk and highway areas may be some of the improvements that may be considered along with any preferred highway improvement option.

Bypass

In 1958, the existing Trans Canada Highway was constructed as the bypass of Duncan. Over 40 years later, this corridor is faced with many of the same issues of the original bypass at a slightly larger scale. Although improvement strategies along the existing highway could address some of the existing issues and extend the life of the asset in the medium-term, another bypass may be considered as a very long-term strategy. Rather than wait for such a time when (and if) financial resources are available, local agencies may begin to protect and perhaps develop sections of a bypass route for ultimate use and upgrade by the province. This approach would obviously build upon the concept of developing a support network as previously discussed and would need to be coordinated with land use plans and policies consistent with that desired for a provincial highway.
4.0 OPTIONS IDENTIFICATION AND ASSESSMENT

This section of the report examines various broad options for addressing the key highway related issues outlined in Section 3.3.

The emphasis of this work was to identify improvement strategies that could reasonably be implemented in the medium-term (5 to 10 years) if funding were available and development along the highway corridor is advanced. These improvement strategies largely include what may be referred to as minor capital projects, such as: access management, intersection improvements, corridor enhancements and support roadway network improvements.

It is also recognized, however, that the issues facing the Trans Canada Highway can not be entirely fixed with minor capital projects. As such, planning for longer term possibilities are considered in this report, merely for the purpose of discussion and future planning initiatives. These types of improvements could involve significant corridor widening and/or implementing a north-south, one-way couplet system through the community.

Finally, there are some very broad possibilities for highway bypasses that are also examined within this review. In some cases, these routes may simply represent good choices for local roadway connections to support access and circulation in the overall communities surrounding the highway. Alternatively, some of these routes may be considered further as possible options for highway bypasses of Duncan. In either case, these are not options that would be endorsed or recommended through a study of this nature.

It should be recognized that the long-term improvements or possible by-passes have been defined as potential routes. Optional alignments would need to be examined further at a concept level to reasonably define and reduce potential impacts.

4.1 Medium-Term Strategies

There are several medium-term strategies that may be considered in order to address safety and mobility issues facing the Trans Canada Highway through the study area within the next 10 years or thereabouts. For the purpose of this review, they are packaged as follows:

- Access Management;
- Intersection Improvements;
- Gateway & Pedestrian Improvements;
- One-Way Couplet Crossing the Highway; and
- Support Roadways.

The following sections briefly describe each of the improvement strategies and provide a high level evaluation of transportation, social, environmental, and financial indicators, which are briefly described as follows: