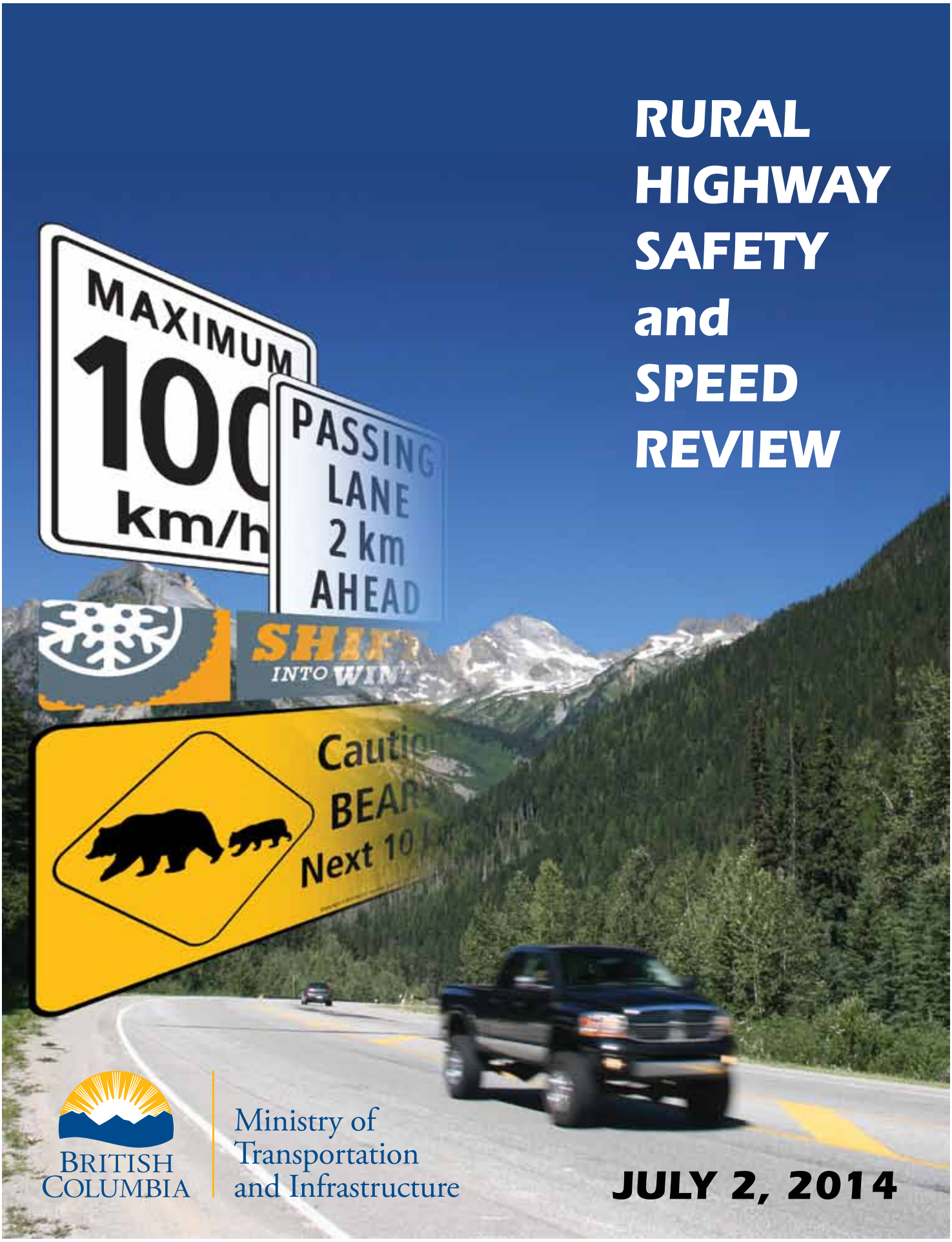
RURAL HIGHWAY SAFETY and SPEED REVIEW



BRITISH COLUMBIA

Ministry of Transportation and Infrastructure

JULY 2, 2014

In October 2013 the Ministry of Transportation and Infrastructure initiated a broad review of safety and speed on the province's rural highways. This review included both a technical component and the collection and consideration of public input. The Ministry's Professional Engineers specializing in traffic operations and highway safety lead the technical portion of the review. The technical review consisting of four areas:

1. Rural highway speed limits
2. Slower moving vehicles
3. Winter tire requirements and use
4. Wildlife hazards

The following report summarizes the ministry's technical analysis and proposed speed limit changes, as well changes to improve safety around slow moving vehicles, clarify and modernize the requirement for winter tires and reduce crashes related to wildlife.

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TABLE OF CONTENTS

Executive Summary

In the fall of 2013, the Ministry of Transportation and Infrastructure initiated a Rural Highway Safety and Speed Review.

The review included four key components:

1. **Speed Limits:** Reviewing rural speed limits will help ensure safety on B.C.'s highways by ensuring that speed limits are set appropriately.
2. **Winter Tires:** Winter tires have undergone significant technological advancements in recent years, and it is time to look at the winter tire definition and the regulations around their use.
3. **Slower-Moving Vehicles:** Slower-moving vehicles, such as recreational vehicles, vehicles towing others or slow vehicles in the left-hand (passing) lane, reduce the efficiency of the highway system and can cause driver frustration.
4. **Wildlife Hazards:** Wildlife on the highway can pose a serious hazard to motorists in many areas of B.C., either when drivers try to avoid animals or if they strike animals.

For each of these components, the Ministry conducted public consultation as well as a technical analysis conducted by the Ministry's engineers. Consultation occurred over 2 months through online surveys and open houses around the province. Feedback was received from over 2,300 participants.

Speed Limits

Speed limits are the maximum speed (in good conditions) that people can legally drive along a section of roadway. When conditions are less than ideal—for example in heavy rain or snow—drivers are required by law to adjust their driving, which includes reducing speed.

In general, there was public support for speed limit increases in the Southern Interior and South Coast regions. There was limited support for speed limit increases in the Northern region. There was significant support for increases on key corridors including:

Highway Segment	Public Support for Speed Limit Increase
Hwy 5: Hope to Kamloops	77%
Hwy 97C: Aspen Grove to Peachland	81%
Hwy 99: Horseshoe Bay to Whistler	83%

Along with public consultation, over 300 speed surveys were conducted on rural numbered highways across the province. The speed surveys measured free flow speeds from which 85th percentile speeds were calculated. The 85th percentile speed represents the speed at or below which 85% of vehicles travel. It is the predominant factor used in setting speed limits in North America.

When assessing speed limits, Ministry Engineers carry out an evaluation using the Institute of Transportation Engineers (ITE) document entitled *"Speed Zone Guidelines – A Proposed Recommended Practice"*. This evaluation includes an analysis of free flow travel speeds and determination of the 85th percentile speed. Other considerations in speed limit analysis include:

- safety history,
- geometric characteristics of the highway,
- consistency of speed limits along the highway, and
- land use.

The speed surveys showed a number of rural highway corridors with 85th percentile speeds in excess of the posted speed limit, and also showed that many corridors are appropriately posted with 85th percentile speeds close to the existing speed limit.

Speed survey results on key corridors:

Highway Segment	Current Speed Limit	85th Percentile Speed
Hwy 5: Hope to Kamloops	110	127
Hwy 97C: Aspen Grove to Peachland	110	126
Hwy 99: Horseshoe Bay to Squamish	80	102
Hwy 99: Squamish to Whistler	80, 90	105

Of the 9,100 km of highway reviewed, approximately 1,300 km are recommended for a speed limit increase. The majority of recommended increases are limited to an additional 10 km/h which will bring the speed limit in line with actual travel speeds. The recommended speed limits are at or below the measured 85th percentile speeds for each corridor.

Speed Limit Change	Length of Hwy	Example
80 to 90 km/h	185 km	Hwy 99, Horseshoe Bay to Squamish
80 to 100 km/h	67 km	Hwy 3, Manning Park West to Allison Pass
90 to 100 km/h	549 km	Hwy 1, Revelstoke to Golden
100 to 110 km/h	144 km	Hwy 97C, Merritt to Aspen Grove
110 to 120 km/h	392 km	Hwy 5, Hope to Kamloops Hwy 97C, Aspen Grove to Peachland

Appropriate speed limits—set close to the 85th percentile speed—increase compliance and reduce speed differentials, thus reducing conflicts between vehicles. Safety analysis showed that serious crashes are trending downward across the province. However, adverse weather conditions on corridors such as the Coquihalla are challenging for drivers.

To improve safety in adverse weather conditions, three variable speed limit systems are recommended to be piloted for the following corridors:

Highway	Segment	Segment Length
Hwy 99	Squamish Valley Rd to Function Junction in Whistler	40 km
Hwy 5	Snowshed Hill to former Toll Plaza	24 km
Hwy 1	Malakwa Perry River Bridge to Hwy 23 Junction Revelstoke	40 km

A variable speed limit system uses a variety of sensors to measure weather, pavement condition, and traffic flow. This information is then used to determine an adjusted speed limit for the conditions.

Winter Tires

Winter weather in British Columbia can vary greatly. British Columbia's mountain passes and interior regions can experience significant winter conditions that challenge both drivers and vehicles. The Ministry posts Winter Tire signs on routes requiring winter tires or chains from October 1 through to April 30. The Motor Vehicle Act currently has a broad definition of winter tires that dates back to 1979. A review of the current definition found that while both Mud and Snow (M+S) and Mountain/Snowflake rated tires are captured by the existing legislation as winter tires, the legislation does not clearly state the requirements.

Public consultation related to winter tires found that most respondents (69%) change their tires seasonally for winter driving. Of those that do change their tires, 63% use winter tires with the Mountain/Snowflake symbol and 34% use all-season tires with the mud and snow rating (M+S). A key theme from stakeholder meetings was a desire for clarification around winter tire requirements.

New Winter Tire Sign

The only jurisdictions in North America that require winter tires with the Mountain/Snowflake symbol are Quebec and Oregon. In Oregon, these tires are only required on select mountain passes when indicated by electronic signs. Safety analysis of crashes in British Columbia showed that serious winter crashes attributed to tire condition are low and have decreased 28% between 2003 and 2012. This indicates that drivers are better prepared and public education campaigns, such as the multi-agency *Shift into Winter* campaign, are having a positive effect. Further safety analysis of collisions attributed to an icy or snowy road surface indicated that the current period of October 1 to April 30 could be adjusted to October 1 through to March 31.

Winter tire related recommendations include:

1. a legislative update to the winter tire definition,
2. an update to regulations to modernize requirements for studded tires and chains,
3. new winter tire signs to clarify requirements for winter tire and chain use and the timeframe for use,
4. increase resources to promote and improve winter safety through the multi-agency *Shift into Winter* campaign.

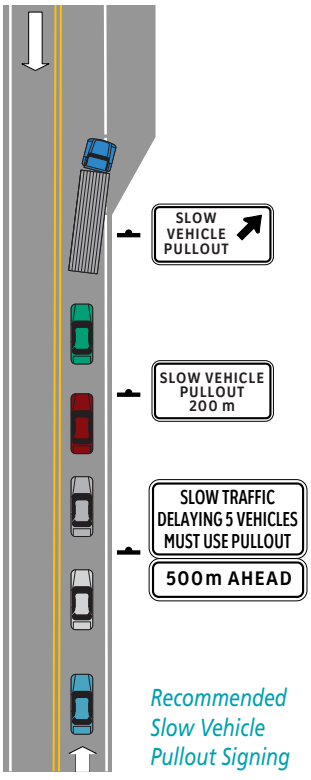
Slower Moving Vehicles

Vehicles travelling too fast, as well as vehicles travelling too slow in comparison to other traffic, can cause safety issues.

Public consultation respondents were generally divided across all regions on the degree to which slower moving vehicles were a safety concern. However, the public consultation did reveal corridor specific concerns and requests for more passing lanes, more "Keep Right Except to Pass" signs and more driver education. In particular, the Highway 4 corridor between Parksville and Tofino stood out with 70% of respondents expressing a concern with slower moving vehicles on that route.

The Ministry reviewed best practices relating to management of slower moving vehicles from other jurisdictions and developed recommendations to improve signing and pavement marking practices. Recommendations related to slower moving vehicles include:

1. improved *Keep Right* signs that emphasize that drivers need to let others pass;
2. updated passing/climbing lane pavement marking to direct drivers to the right lane (use with updated signs); and
3. pilot signs requiring *Slow Traffic Delaying 5 Vehicles Must Use Pullout* on the Highway 4, Parksville to Tofino corridor.
4. Update legislation to clarify "*Keep Right Except to Pass*" requirements.



Recommended Slow Vehicle Pullout Signing

Wildlife

Wildlife on rural highways in B.C. represents a serious potential hazard to drivers. The Ministry of Transportation and Infrastructure receives reports of approximately 5,500 wildlife collisions each year. Large animals such as bear, deer, elk and moose pose the greatest danger due to their size.

B.C. has numerous mitigation measures in place to reduce wildlife-vehicle collisions. These include exclusion systems (fencing, over and under passes, ungulate guards, etc.), roadside mowing and clearing and advisory signage.

Public consultation regarding wildlife safety indicated that participants rarely found wildlife to be a concern in the South Coast or Southern Interior, but were more likely to see a concern in the North, Central (Cariboo) and West Kootenay and Rocky Mountain areas.

Ministry wildlife collision information shows that deer, elk and moose are the animals hit most often on B.C. highways. Areas with the highest density of wildlife collisions:

Deer	Elk	Moose
Hwy 3: Fort Steel to Elko	Hwy 3: Fort Steel to Elko	Hwy 97: Dawson Creek to Fort St. John
Hwy 97: Williams Lake to Quesnel	Hwy 93: Wasa to Radium Hwy 3: Yahk to Cranbrook	Hwy 97: Prince George to Parsnip River
Hwy 97: 100 Mile House to Williams Lake	Hwy 3: Elko to Alberta Border	Hwy 97: Chetwynd to Dawson Creek

Wildlife exclusion systems, such as those found on Highway 5 (Coquihalla), Highway 97C (Okanagan Connector) and part of Highway 19 north of Parksville, are very effective at reducing wildlife collisions. However, these systems are very expensive and are most effective on limited access freeway type highways. Wildlife detection systems are experimental, but show promise. These systems detect animals near the highway and then advise drivers using activated warning signs.

To reduce wildlife crashes on B.C. highways, the following recommendations were made:

1. Implement new gateway signs for longer highway segments where there is an increased risk of encountering large wildlife.
2. Implement LED wildlife signs in specific high wildlife crash locations and flash the LEDs based on seasonal information.
3. Pilot two wildlife detection systems for Highway 3 between Fort Steele and the Alberta border.
4. Increase the use of DriveBC and changeable message signs for real-time wildlife advisory messages.

Introduction

In the fall of 2013, the Ministry of Transportation and Infrastructure (MoTI) initiated a Rural Highway Safety and Speed Review. The overarching purpose of this review is highway safety and ensuring that speed limits on rural highways are set appropriately.

The Ministry of Transportation and Infrastructure's last broad formal speed review was completed in 2003. The 2003 report identified areas where speed limits could be raised, along with some areas where speed limits should be lowered. Since 2003, the Ministry has used the principles outlined in that report to adjust speed limits around the province, including some increases on major highways, such as Highway 1. The current review builds on the work done during the 2003 review.

Since 2003, $14 billion has been invested in upgrades to most of the major highway corridors in B.C., including Highway 1, Highway 97 along the Cariboo Connector, and through the Okanagan Corridor Valley.

The following are just some of the completed safety improvements:

- 180 kilometres of new four- and six-lane sections,
- 30 new passing lanes,
- 14 new interchanges,
- 16 pullouts for slower-moving vehicles, and
- over 6,500 kilometres of rumble strips

During this period of substantial highway investment there have also been improvements in other areas of highway safety, for example:

- driver licensing/training/education,
- vehicle technology,
- enforcement of high risk activities,
  - distracted driving,
  - impaired driving,
  - aggressive driving.

In consideration of these significant changes, it was decided to review aspects of safety along longer stretches of provincial rural highways between communities in the following areas:

- **Speed Limits:** Reviewing speed limits will help ensure that everyone travelling B.C.'s highways can do so as safely and efficiently as possible.
- **Winter Tires:** Winter tires have undergone significant technological advancements in recent years, and it is time to look at the winter tire definition and the regulations around their use.
- **Slower-Moving Vehicles:** Slower-moving vehicles, such as recreational vehicles, vehicles towing others or slow vehicles in the left-hand (passing) lane, reduce the efficiency of the highway system and can cause driver frustration.
- **Wildlife Hazards:** Wildlife on the highway can pose a serious hazard to motorists in many areas of B.C., either when drivers try to avoid animals or if they strike animals.

For each of these components, the Ministry conducted public consultation to gather feedback and ideas from across the province as well as a technical analysis conducted by the Ministry's engineers.

Speed Limits on Rural Highways

Background

Speed limits are the maximum speed at which vehicles may lawfully travel along a stretch of road. They are set to promote safety and provide a balance between safety and mobility. Speed limits are set for ideal conditions—good visibility, good weather, bare and dry pavement, and an alert driver. When conditions are less than ideal, for example rain or snow, drivers are required by law to adjust their driving to the conditions, which includes reducing their travel speed.

Each driver chooses a speed with which they feel safe driving. Speed choice is based on a variety of factors:

- highway characteristics (alignment,curves, grades, width, number of intersections, etc);
- weather and environment (e.g. raining and dark vs. dry and sunny);
- traffic (volume of vehicles, level of congestion, urban vs. rural);
- vehicle characteristics (age, condition, performance);
- purpose of travel (commuting on familiar roads, vacationing, working).

Because drivers choose different speeds, a range of operating speeds results. Where drivers are unsure of an appropriate speed, large speed variations or "speed differentials" can develop. This in turn results in less consistent traffic flow, increased driver uncertainty and/or frustration and increased crash risk.

Speed limits should be set so that they include the behaviour of the majority of drivers and provide an appropriate maximum speed. The normally careful and competent actions of reasonable drivers should be considered legal. This means that travelling at the speed limit should feel that it is truly a maximum or it's not an effective limit. Setting appropriate speed limits increases speed limit compliance and reduces speed differential, resulting in reduced crash risk.

A common misconception with changes to speed limits is that if the speed limit is increased, speeds will increase as well. However, findings from past changes within B.C. as well as other jurisdictions have found that speed increases are minimal, but instead what happens is that the speed differential are reduced (i.e. there is less range in the speeds chosen by drivers). In 1996 and 1997, the Province undertook a review of provincial highway speed limits and made a number of changes. Before and after comparisons of speeds on the corridors that were changed showed that speeds increased by approximately ¼ of the change in speed limit. In other words, if the speed limit was increased from 90 km/h to 100 km/h, the increase in driver speeds would be about 2–3 km/h.

It is good practice to periodically review speed limits. Over time, changes to vehicle technology, improvements to the highway, or development can result in speed limits that are out of step with driver behaviour. The focus of this speed limit review is to examine the appropriateness of speed limits on sections of rural highway between communities. Existing reduced speed zones in cities, towns and villages are not included in this review.

Public Consultation

Public input was a key component of the Rural Highway Safety and Speed Review. Input received from public consultation along with information gained through technical analysis of highway speeds was used to recommend changes to existing speed limits. Throughout December 2013 and January 2014, open houses were held in communities throughout British Columbia to ask the public about speed limits on rural corridors. A Twitter Town Hall was held to further discussion and online feedback was sought through a website dedicated to the review.

Public input was sought on 54 corridors representing approximately 9,100 km of rural highway throughout the province. The public consultation report can be found at: Rural Highway Safety and Speed Review Consultation and Engagement Summary Report, March 2014.

Public consultation showed general support for speed limit increases on a number of highways in the South Coast and Southern Interior. Feedback received for the Northern region showed a more divided opinion on speed limits.

Table 1 – Public Consultation Results for Key Corridors in South Coast and Southern Interior

Highway Segment	Support for Increased Speed Limit
Hwy 1: Abbotsford to Hope	86%
Hwy 1: Revelstoke to Golden	61%
Hwy 3: Hope to Princeton	68%
Hwy 5: Hope to Kamloops	77%
Hwy 19: Parksville to Campbell River	57%
Hwy 97C: Peachland to Merritt	81%
Hwy 99: Horseshoe Bay to Squamish	83%

Existing Condition

Current Speed Limits in B.C.

Speed limits on provincial highways are set by the Minister of Transportation and Infrastructure through authority granted by the Motor Vehicle Act. The Motor Vehicle Act does not establish minimum or maximum speed limits other than default 50 km/h urban and 80 km/h rural statutory limits that apply when speed signs are not posted.

In rural areas, speed limits on numbered highways are typically set at either 80 km/h, 90 km/h or 100 km/h; with 100 km/h being the predominant rural speed limit. In British Columbia, the current maximum speed limit is 110 km/h. The 110 km/h speed limit is posted on the Coquihalla (Hwy 5), Okanagan Connector (Hwy 97C) and Island Highway (Hwy 19), which are rural divided freeways.

Maximum Speed Limits in Other Jurisdictions

When considering maximum speed limits, attention is often drawn to both Europe and the USA.

The practice of posting speeds higher than 110 km/h takes place in many European countries and the USA. Speed limits on rural freeways in Europe range from 90 km/h in Norway to the unrestricted speeds of parts of the German Autobahn (although an advisory speed of 130 km/h is posted). Notably, 120 km/h to 130 km/h are the most common maximum posted speeds.

Table 2 – Examples of Maximum Freeway Speed Limits in Europe

100 km/h	110 km/h	120 km/h	130 km/h	140 km/h
Norway	United Kingdom	Belgium	Austria	Poland
	Russia	Finland	France	
		Spain	Germany (advisory)	
		Switzerland	Italy	
		Sweden	Denmark	
			Netherlands	

Speed limits on rural freeways in the United States range from 90 km/h to 130 km/h with the majority of states having an upper limit of 110 to 120 km/h. After the American Federal Government lifted the mandatory 55 mph (90 km/h) legislation in November 1995 on all federal interstates, many western states posted freeways in rural areas at 75 mph (120 km/h). The nearby coastal states of Washington, Oregon and California all have maximum posted speed limits of about 110 km/h whereas states such as Idaho, Montana, and Colorado have maximum posted speed limits of 120 km/h.

Table 3 – Examples of Maximum Freeway Speed Limits in the United States

90 – 100 km/h	110 km/h	120 km/h	130 km/h	Over 130 km/h
Alaska	California	Colorado	Utah	Texas (138 km/h)
Delaware	Florida	Idaho		
Hawaii	Michigan	Montana		
	Oregon	Nevada		
	Vermont	North Dakota		
	Washington	Wyoming		

Maximum posted speed limits in Canadian provinces range from 90 km/h to 110 km/h.

Table 4 – Maximum Canadian Speed Limits

90 km/h	100 km/h	110 km/h
Prince Edward Island	Newfoundland	Nova Scotia
	Quebec	New Brunswick
	Ontario	Manitoba
		Saskatchewan
		Alberta
		British Columbia

Speed Analysis

Throughout the fall of 2013, over 300 speed surveys were conducted on rural numbered highways across the province. In addition to conducting speed surveys, historic speed data from permanent traffic count stations throughout the province was also reviewed to determine speed trends over time.

The speed surveys measured free flow speeds on rural numbered routes. From the speed survey results 85th percentile speeds were calculated. The 85th percentile speed represents the speed at or below which 85% of vehicles travel. It is the predominant factor used in setting speed limits in North America.

Because each driver chooses their own travel speed, no single number can represent all the speeds seen at a location. However, free flow speeds have been found to be normally distributed (i.e. a bell curve) which allows for relatively straightforward statistical analysis. Figure 1 shows a summary of the information collected from a single speed survey on Highway 97C, Westbound. The steepest part of the curve, between the 15th percentile and 85th percentile speeds represents the majority of drivers. The lower the speed differential, the steeper the line is as there is less difference between the 15th and 85th percentile speeds.

Most cumulative distribution curves "break" at approximately 15 percent and 85 percent of the total number of observations. Consequently, drivers in the lower 15 percent are considered to be driving unreasonably slow and those above the 85th percentile are considered to be driving unreasonably fast. Because of the curve's steep slope between the 15th and 85th percentiles, posting a lower speed limit, not close to the 85th percentile, would put a large percentage of safe drivers in violation of the law.

How Speed Limits are Set

In setting speed limits, Ministry engineers carry out an evaluation using the Institute of Transportation Engineers (ITE) document, entitled *"Speed Zone Guidelines – A Proposed Recommended Practice"*.

This evaluation recommends that speed limits be set on the basis of an engineering study that includes an analysis of the speed distribution of free flowing vehicles to determine 85th percentile speed.

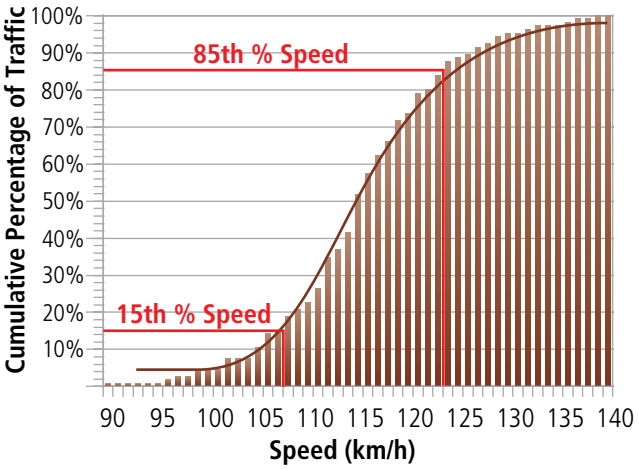
Other considerations in speed limit analysis include:

- safety history,
- geometry characteristics of the highway,
- consistency of speed limits, and
- land use.

By applying these speed limit setting guidelines, the Ministry will:

- provide consistent speed limits that reflect the 85th percentile speed,
- reduce speed differentials by having more drivers travel within the same speed range,
- aid enforcement by establishing the legal maximum speed limit.

Cumulative Speed Distribution for Highway 97C Westbound (Brake Check 18 km East of Loon Lake)



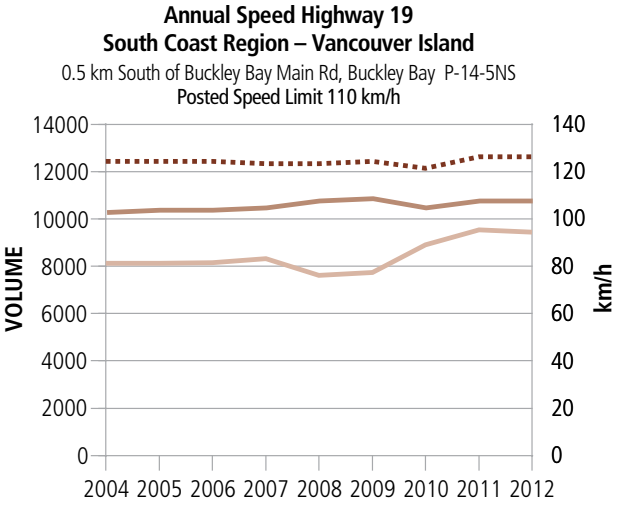
Westbound	
Total Vehicles	106
Minimum Speed	90
Maximum Speed	139
Differential	17
Average Speed	116
15th Percentile	107
85th Percentile	124

Figure 1 – Example of speed distribution from Hwy 97C Survey

Past Experience with Speed and Speed Limit Changes in B.C.

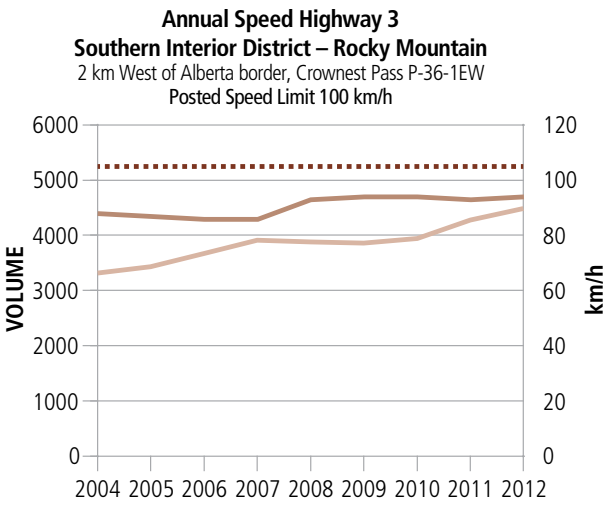
The Ministry monitors traffic volume and speeds over time at several traffic count stations throughout the province. The traffic count stations count each vehicle that passes over sensors embedded in the pavement surface. At many count stations two sets of sensors are placed in the roadway which allows vehicle speeds to be calculated.

The data from these stations provides a picture of how actual travel speeds and volumes are changing. Figures 2 and 3 illustrate two examples of annual summaries of information from traffic count stations.



	2004	2005	2006	2007	2008	2009	2010	2011	2012
AADT	8131	8118	8154	8313	7602	7735	8913	9542	9445
% Trucks	5	5	5	5	6	5	7	7	7
85 Percentile	124	124	124	123	123	124	121	126	126
Avg Speed	103	104	104	105	108	109	105	108	108

Figure 2 – Annual Speed and Volume Information from Count Station on Highway 19



	2004	2005	2006	2007	2008	2009	2010	2011	2012
AADT	3317	3426	3672	3911	3884	3861	3937	4277	4488
% Trucks	16	16	17	17	16	16	16	16	16
85 Percentile	105	105	105	105	105	105	105	105	105
Avg Speed	88	87	86	86	93	94	94	93	94

Figure 3 – Annual Speed and Volume Information from Count Station on Highway 3

In the graphs, the 85th percentile speed, average speed and volume (represented by Annual Average Daily Traffic, AADT) are shown over a period of 9 years. As both the Highway 19 and Highway 3 examples illustrate, vehicle speeds have remained relatively consistent over the years despite changes in the number of vehicles travelling the highway.

Although broad, province-wide speed limit reviews are infrequent; individual highway corridor reviews are common. Before and after speed survey information from corridors where the speed limit has been changed, show that operating speeds generally do not change significantly. If a change in driver speeds is observed, it is typically an increase less than 3 km/h.

One example of the kind of smaller speed limit changes the Ministry makes more regularly, occurred in 2006 on a section of Highway 1 west of Tappen.

Figure 4 – Highway 1, Balmoral Rd to Ford Rd: Extent of 2006 Speed Limit Increase

Following completion of a 4 laning project, Ministry engineers reviewed the speeds and determined that the speed limit should be increased from 90 km/h to 100 km/h. A speed survey taken in 2005 when the speed limit was 90 km/h showed an 85th percentile speed of 114 km/h. Another survey taken in 2008, after the speed limit increase to 100 km/h, showed an 85th percentile speed of 114 km/h.

Speed Surveys

Over 300 speed surveys were conducted on rural highways across the province as part of this review. The main purpose of the speed surveys was to determine the 85th percentile speed of free flowing traffic on each highway segment. The table below summarizes the 85th percentile results of speed surveys on key corridors.

Table 5 – Summary of Speed Survey Results on Key Corridors

Hwy Segment	Current Speed Limit	85th Percentile Speed from Speed Surveys
Hwy 1: Abbotsford to Hope	100	116
Hwy 1: Revelstoke to Golden	90	103
Hwy 3: Sunshine Valley to Manning Park	80,90	103
Hwy 5: Hope to Kamloops	110	127
Hwy 19: Parksville to Campbell River	110	121
Hwy 97C: Aspen Grove to Peachland	110	126
Hwy 99: Horseshoe Bay to Squamish	80	102
Hwy 99: Squamish to Whistler	80, 90	105

Highway segments through communities where there are features such as increased development, driveway access, losely spaced signals, larger numbers of pedestrians and cyclists—were not included in the review and will not be affected.

Safety Analysis

Vehicle collision data provides a picture of how safely people are driving on different highways.

As stated earlier in the speed section, the 85th percentile speed indicates the results of a drivers' speed choice based on their understanding of safe speed.

The relationship between speed and safety is complex. Research indicates that it is difficult to separate the effects of speed from other characteristics, individually and in combination, in the driving environment.

Relationship Between Speed and Safety

Speed plays an important role in road safety and the objective of establishing an appropriate speed limit is to enhance traffic safety. An appropriate speed limit increases compliance and reduces speed differentials thus reducing conflicts between vehicles.

Studies have observed that the majority of drivers choose speeds they perceive as acceptably safe and do not adhere to speed limits that appear unreasonable. Speed choice is affected by many factors such as vehicle characteristics, road environment, etc. Notably, vehicle technology and safety features have advanced considerably over the past decade. The characteristics of the modern vehicle fleet (for example, vehicle stability control and anti-lock braking) affect speed choice. As well, drivers tend to drive at higher speeds as road geometric characteristics improve which is evident in many of the newer and improved highway facilities in the province.

When there is a disparity between the posted speed limit and the speed drivers choose larger speed differentials are likely.

Where there is large speed differential, drivers are less predictable, resulting in more encounters and conflicts, more overtaking manoeuvres and more driver frustration. These changes in driver behaviour and action increase collision risk.

Research has shown that driving faster than the surrounding traffic increases the crash risk, particularly when driving faster than the average speed. In addition, roads with a higher speed differential displayed a higher crash rate compared to roads with a smaller speed differential.

Many studies have clearly documented that as travel speed increases, the risk of being in a collision and the severity of that collision also increases.

There is a perception that raising the speed limit will automatically increase travel speeds by the same amount; however this has been studied and found not to be the case.

A U.S. Federal Highway Administration (FHWA) publication, Effects of Raising and Lowering Speed Limits on Selected Roadway Sections, January 1997, analyzed speed and collision data in 22 US States at 100 sites before and after speed limits were changed. The sites included 63 rural sites, 22 small urban sites, and 15 urban sites. The study found that neither raising nor lowering the speed limit had much effect on vehicle operating speeds. "The mean speeds and the 85th percentile speeds did not change more than 1 or 2 m/h (1.6 or 3.2 km/h)". It was observed that driver compliance improved with increased speed limit. Also, there was no significant difference in crash experience when the posted speeds were altered. *"This nationwide study confirms the results of numerous other observational studies which found that the majority of motorists do not alter their speed to conform to speed limits they perceive as unreasonable for prevailing conditions".*

Washington State Department of Transportation information states that *"people don't automatically drive faster when the speed limit is raised. These are common misconceptions, along with the mistaken belief that speed limit signs will decrease the accident rate and increase safety, and highways with posted speed limits are safer than unposted highways".*

Review of the Results of BC's 1996 Speed Limit Review

Speed limits on rural provincial highways were previously reviewed in 1996. After the review, changes were implemented in 1997 and speed limits were raised on approximately 2,300 km of rural highway. Posted speed limits were increased from 90 km/h to 100 km/h on approximately 1,870 km of highway, while nearly 460 km were changed from 80 km/h to 90 km/h.

Safety analysis showed that serious collisions decreased on those highways by 18% when 5 years before and after implementation were compared. The decrease in collisions occurred during the same time traffic volumes increased by 31% in the areas studied.

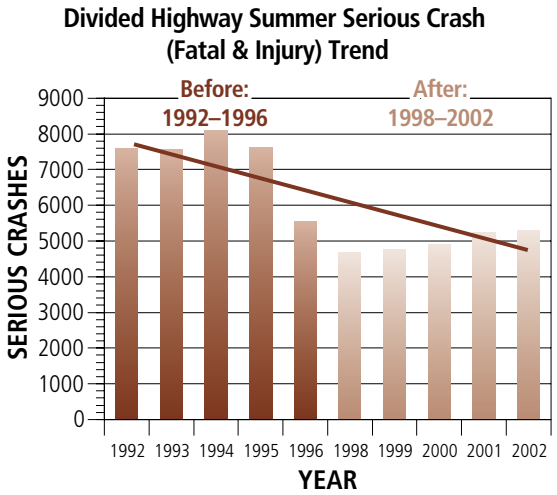


Figure 5 – Provincial Serious Collision Trend

The speed limit changes from the 1996 review do not appear to have had an adverse effect on safety.

BC Rural Highway Safety Trends

In order to gain an understanding of how safely drivers travel through B.C., data from police reported serious crashes (fatal + injury crashes) on rural highways was analyzed over a ten year period to determine safety trends by highway type.

Posted speed limits are the maximum legal driving speed for ideal road conditions. Summer best represents ideal conditions therefore the summer collision history was reviewed. For purposes of the review the summer period was defined as May through to and including September.

Divided Highways

The highest posted speeds in BC are on freeways that have at least 4 lanes with controlled access points that are limited in number, and where opposing lanes of traffic are separated by a median. These divided highways currently have a maximum posted speed limit of 110 km/h, and include the following corridors:

- **Highway 5 Coquihalla:** Hope – Kamloops
- **Highway 97C Okanagan Connector:** Merritt – Peachland
- **Highway 1 Trans-Canada:** Abbotsford – Hope
- **Highway 19 Island Highway:** Parksville – Campbell River

The summer serious collision trend from 2003–2012 for all the above corridors, is decreasing, as shown in Figure 6.

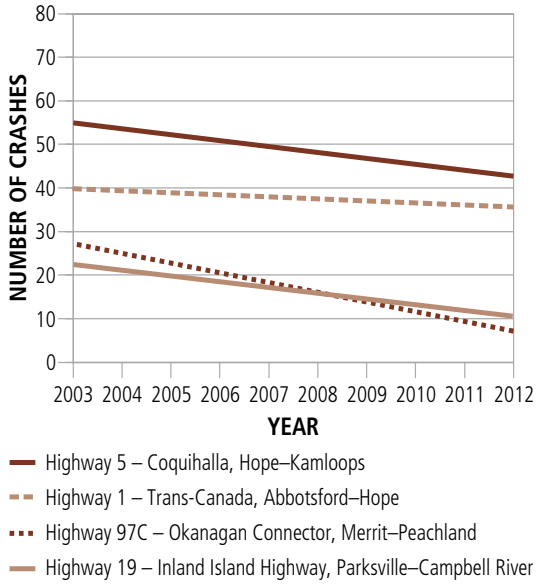


Figure 6 – Divided Highway Summer Serious Crash Trend

Serious summer collisions on the provincial numbered highway system decreased by 27% from 2003–2012. All of the divided highway corridors exceeded the provincial safety performance, except for Highway 1 Trans-Canada: Abbotsford – Hope, where the safety performance improved but to a lesser degree.

Undivided Highways

The majority of the provincial numbered highway system consists of rural undivided 2 lane highways. Undivided highways are currently posted at a maximum speed limit of 100 km/h.

Major undivided corridors are:

- Highway 1 Trans-Canada: Kamloops – Alberta Border
- Highway 97 Cariboo Connector: Cache Creek – Prince George
- Highway 16 Yellow Head: Prince Rupert – Prince George
- Highway 16 Yellow Head: Prince George – Alberta Border
- Highway 37 Stewart Cassiar: Kitimat to Alaska Border
- Highway 3 Crowsnest: Princeton to Alberta Border

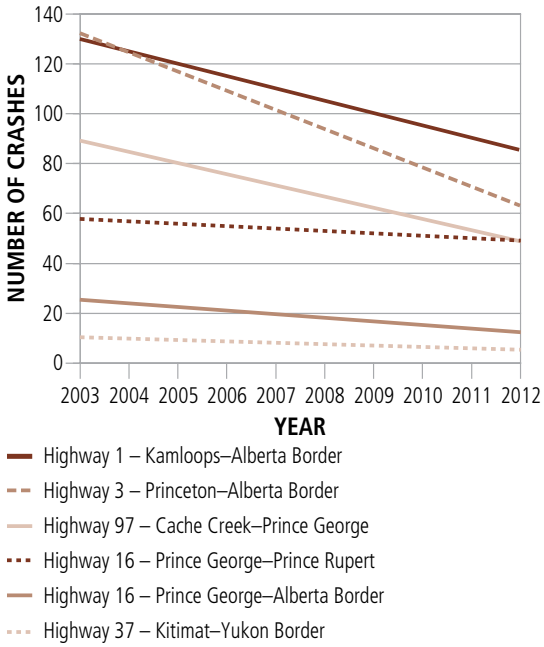


Figure 7 – Undivided Highway Summer Serious Crash Trend

Serious summer collisions on the provincial numbered highway system decreased by 27% from 2003–2012. Undivided highways in the northern region of the province showed safety performance improvements but to a lesser degree than in the south.

Highway 3 Crowsnest, Princeton to Alberta Border and Highway 97 Cariboo Connector, Cache Creek – Prince George exceeded the provincial safety performance

Highway 1 Trans-Canada, Kamloops – Alberta Border performed similarly to the provincial numbered highway system, and had a 23% decrease in summer serious collisions from 2003–2012.

The summer safety trends clearly show that safety performance has been steadily improving on rural highway corridors.

The key drivers for this safety improvement are a combination of:

- driver licensing/training/education;
- vehicle technology;
- enforcement of high risk activities:
  - distracted driving,
  - impaired driving,
  - aggressive driving.
- highway improvements

Highway Design and Vehicle Technology

Most BC highways are designed based on geometric guidelines developed between 30 and 70 years ago. Highways are designed in a conservative manner to facilitate the safe movement of vehicles assuming less than ideal conditions (smooth tires, wet pavement).

Prior to beginning a highway design, a design speed is selected and is used as guidance to determine minimum values for highway elements, such as horizontal curve radius and sight distance, during the design process. Along a corridor the majority of the highway exceeds these minimum values although through mountainous terrain there may be some highway features, such as curves, that are closer to those threshold values. In this case, the appropriate yellow warning signs would be used. Hence, the design speed does not represent the maximum safe speed of the highway. Since highway designs contain many conservative elements, vehicle operating speeds typically exceed the design speed. A posted speed limit set near the 85th percentile speed represents the maximum legal limit under ideal conditions (bare and dry pavement) and is a better indicator of a maximum safe speed than design speed.

In 2011, the American Association of State Highway and Transportation Officials (AASHTO) released an updated Design Guide revised to include design criteria based on the performance of the modern day vehicle fleet. For similar design elements, the new guidelines would generally allow for 10 km/h above the existing design speed used in BC.

Advances in vehicle technology have made modern day vehicles safer than their predecessors, made driving safer, and contributed to a downward trend in collisions. The latest research published by the National Highway Traffic Safety Administration (NHTSA) estimates that 200,000 collisions were prevented and 600 lives were saved in the United States by improvements made to the 2008 model year fleet vs. the 2000 model year fleet. Anti-lock braking and electronic stability control are just two examples of advances in vehicle safety technology that have made modern day vehicles safer. Emerging technologies such as forward collision warning/avoidance systems, lane departure warnings, automated braking, adaptive headlights, blind spot detection, and intelligent transportation systems are rapidly making vehicles and roads even safer.

Seasonal Crashes

Winter driving can be challenging in British Columbia. Mountainous terrain and large changes in elevation along a route can result in road and weather conditions that vary greatly. On high mountain routes such as the Coquihalla highway, the Snowshed Hill portion stands out for its extremely heavy, and sometimes unexpected, snowfall.

Figure 8 illustrates the impact that severe winter weather can have on safety. Although drivers are expected to adjust their speed to conditions, it can be difficult for drivers to judge what an appropriate speed is. Despite lower traffic volumes during winter, severe winter conditions contribute to increased crashes on the Snowshed Hill portion of Highway 5.

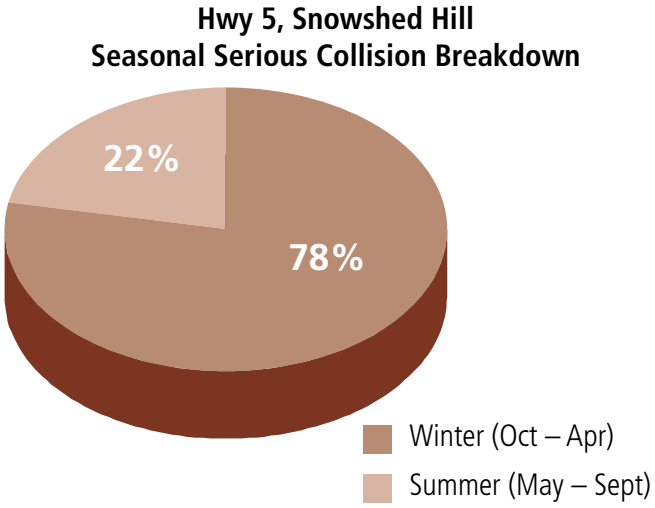


Figure 8 – Ten Years (2004–2013) of Seasonal Collision Data for Snowshed Hill on Highway 5

Variable Speed Limits

The purpose of speed limits is to inform drivers of the maximum acceptable speed under ideal road and weather conditions. However, if roadway conditions are less than ideal, such as during heavy rain, snow or black ice, regular speed limit signs may not display an appropriate speed limit for those conditions. Drivers are expected to adjust their speed to the conditions. However, even when adverse weather conditions are recognized by drivers, they may not know how much to reduce their speed.

A variable speed limit (VSL) system uses a variety of sensors that measure weather, pavement condition and traffic flow. The data from these sensors is analyzed and transmitted to a control centre where a decision is made whether the speed limit needs to be adjusted. That adjusted speed limit is then displayed on changeable LED speed limit signs. This process is repeated as conditions change so that drivers always know the appropriate speed limit. Additional variable message signs can also be used to provide alerts or information to drivers about road conditions to support and explain why they are seeing reduced speed limits on the LED speed limit signs.

The advantages of a variable speed limit system are not limited to adjusting the speed limit due to weather conditions, it can also be used to adjust speeds:

- for wildlife on the roadway,
- due to congested conditions,
- to slow traffic approaching a crash scene,
- for speed management in work zones

Several U.S. States have installed various types of VSL systems to respond to adverse weather conditions:

- **Washington State:** through Snoqualmie Pass, I-90
  - Semi-automated system based on feedback from weather stations, snow plow operators and State Patrol. Computer recommends a speed which is then checked by an operator.
- **Colorado:** several VSL systems on I-70
  - Speed limits are manually reduced from 65 mph to 55 mph when chain laws are in effect.
- **Wyoming:** along I-80 between Laramie and Rawlins (Elk Mountain corridor)
  - Manually adjust speeds based on feedback from police or maintenance personnel and measurements of vehicle speeds (average speed plus 5 mph).
- **Oregon:** currently in the process of implementing several VSL systems to manage speeds in response to congestion, adverse weather conditions, or both.
  - Systems will be fully automated using traffic and weather sensors to calculate the speed limit (can be overridden by an operator if necessary).
- **Utah:** through Parleys Canyon on I-80
  - System is semi-automated (operators are given suggested speed limit from automatic system, but make final decision) based primarily on real-time 85th percentile speeds and chain-up requirements/ advisories.

Variable speed limit systems are a relatively new technology and few systems are more than 2–3 years old. However, initial results from jurisdictions with variable speed limit systems show positive safety results.

Many highways in British Columbia pass through more than one climatic zone and/or experience significant changes in elevation that can result in vast differences in weather along the corridor. Maximum speed limits are applicable under idea road and weather conditions, hence drivers are expected to adjust their driving when conditions are less than ideal. However, an appropriate adjusted speed is not necessarily apparent. Variable speed limit systems will improve safety in adverse weather conditions.

Speed Recommendations

A technical team undertook an assessment of each corridor to evaluate engineering criteria including free flow travel speeds and the 85th percentile speed, as well as safety experience, geometric charcteristics, and land use. This was combined with the public consultation results to identify the sections that are recommended for increase.

Prevailing travel speeds were measured and it was found that the 85th percentile speed on these highways is upwards of 10 km/h above the speed limit. There is a close correlation between the 85th percentile speeds and public support for speed limit increases.

Serious crashes are also trending down significantly on provincial highways—26% decrease since 2003. This is attributed to:

- vehicle technology and safety features;
- targeted and strategic enforcement;
- increased penalties and driver education; and
- $14B investment in highway upgrades since 2003.

Public Consultation showed there was strong support to increase speed limits on a number of highways in the South Coast and Southern Interior. There was less support for speed limit increases in the North.

Recommendation 1:

Increase speed limits where supported by the 85th percentile speed and public consultation.

Approximately 9,100 km of rural highway were reviewed, of which about 1,300 km are recommended for increase.

- Rural divided freeways will have a maximum posted speed limit up to 120 km/h.
- Rural undivided highways will have their speed limits normalized for corridor consistency up to 100 km/h, with some sustained 4-lane sections up to 110 km/h.

The table on the following page provides a summary of speed limit changes. For full details on each highway segment, refer to Appendix A.

Speed Limit Change	Length of Highway	Example
from 80 to 90 km/h	185 km	Hwy 99 – Horseshoe Bay to Squamish
from 80 to 100 km/h	67 km	Hwy 3 – Manning Park West Gate to Allison Pass
from 90 to 100 km/h	549 km	Hwy 1 – Revelstoke to Golden
from 100 to 110 km/h	144 km	Hwy 97C – Merritt to Aspen Grove
from 110 to 120 km/h	392 km	Hwy 5 – Hope to Kamloops Hwy 19 – Parksville to Campbell River

Existing reduced speed limits in cities, towns and villages will not be changed.

Recommendation 2:

Implement 3 Variable Speed Limit Systems.

Variable speed limits are an emerging safety technology using changeable LED signs where speed limits are adjusted, based on road conditions.

Highway	Segment	Length	Cost
Hwy 99	Squamish Valley Rd to Function Junction	40 km	$3.0M
Hwy 5	Snowshed Hill to old Toll Plaza	24 km	$4.0M
Hwy 1	Malakwa Perry River Bridge to Hwy 23 Junction Revelstoke	40 km	$4.0M

Recommendation 3:

Consult on an additional 550 km of secondary highway identified through the technical review as potential candidates for change. Additional highways, for further assessment, are summarized in Appendix B.

Highway Description	Length of Change (km)	Speed Limit	
		Existing	New
Hwy 1, Victoria to Nanaimo Three sections between Bench Road and Nanaimo River Bridge	9	80, 90	90
Hwy 1, Abbotsford to Hope Whatcom Rd (Exit 95) to Junction with Highway 3 (Exit 170)	74	100	110
Hwy 1, Hope to Cache Creek 1 km east of the Lake of the Woods Rest Area to 1.2 km west of the Highway Maintenance Yard in Boston Bar	55	80, 90	100
420 m east of Northbend Ferry road to 820 m east of Falls Creek	24	90	100
Hwy 1, Cache Creek to Kamloops Six Mile Rest Area to Savona Station Rd	12	90	100
Hwy 1, Kamloops to Salmon Arm Willow Rd (5 km East) to Hilltop Rd (Excluding 60 km/h through Sorrento)	25	90	100
Hwy 1, Salmon Arm to Golden Canoe (70th St NE) to Revelstoke (Highway 23S) (Excluding existing 60 km/h through Sicamous)	58	90, 100	100
Revelstoke (Highway 23N) to Golden (Anderson Rd) Excluding Parks Canada Section	101	90	100
Hwy 3, Hope to Princeton Start of Highway 3 (Exit 170) to Junction with Highway 5 Coquihalla (Exit 177)	7	100	110
End of 4 Lane (1.2 km West of Manning Park West Gate) to 500 m East of Allison Pass Highway Maintenance Yard	33	80, 90	100
Sunday Summit to Whipsaw Creek	22	80	90
Hwy 5, Hope to Kamloops Junction with Highway 3 Coquihalla (Exit 177) to 500 m south of the Variable Message Sign	4	100	110
Othello Rd to Junction Hwy 1	200	110	120
Hwy 5, Kamloops to Tête Jaune Cache Tod Mountain Rd to Junction Hwy 24 (Excluding 60 km/h through Barriere)	67	90	100
Hwy 5A, Princeton to Merritt Old Hedley Rd to Hwy 97C Junction (excluding existing 70 km/h through Aspen Grove)	36	80	90
Hwy 6, Nelson to Nakusp Golf Course Rd (North of New Denver) to Purdy Rd (North of Hills) (Excluding 70 km/h through Hills)	15	80	90
Purdy Rd (North of Hills) to Upper Brouse Rd (Nakusp)	22	90	100
Hwy 7, Mission to Hope Pullout West of Haigh Scale to Junction with Hwy 1	5	90, 100	100
Hwy 19, Nanaimo to Campbell River 1 km north of Parksville Exit/Weigh Scale to 300 m south of Willis Road	114	110	120

Highway Description	Length of Change (km)	Speed Limit	
		Existing	New
Hwy 19, Campbell River to Port Hardy			
200 m north of Duncan Bay Road to 500 m north of Mohun Creek Bridge	10	80	90
500 m north of Mohun Creek Bridge to Gentry Road	44	90	100
Cluxewe Bridge to Douglas Street	25	80, 90	100
Hwy 33, Rock Creek to Kelowna			
South of Gallagher Rd to McCulloch Rd	32	90	100
1 km North of Junction with Hwy 3 to 1km south of Christian Valley Rd	12	90	100
Hwy 97, Cache Creek to Williams Lake			
1 km North of Willow Drive (70 Mile House) to BCR Overpass (100 Mile House)	37	100	110
Hwy 97, Kelowna to Vernon *pending median barrier assessment			
Gatzke Rd (North of Oyama) to College Way (South of Vernon)	16	90	100
Hwy 97, Vernon to Kamloops			
Junction Hwy 97A (Swan Lake) to Westside Rd	6	80	90
Hwy 97A, Vernon to Sicamous			
North of Smith Drive to Hwy 97B Junction (Excluding 50 km/h through Enderby)	18	90	100
Junction with Hwy 97B to Sicamous Creek Bridge (Excluding 50 km/h through Grindrod)	33	80	90
Hwy 97C, Merritt to Peachland			
Junction with Hwy 5 Coquihalla (Coldwater Interchange) to Junction with Hwy 5A (Aspen Grove)	22	100	110
Junction with Hwy 5A (Aspen Grove) to Junction with Hwy 97 (Drought Hill Interchange)	78	110	120
Hwy 99, North Vancouver to Whistler			
Eagle Ridge Interchange to 150 m South of the Stawamus River Bridge	35	80	90
400 m North of Depot Rd to Alta Lake Rd	45	80, 90	100
Hwy 99, Whistler to Cache Creek			
400 m South of Whistler Heliport Rd to Pemberton Boundary	21	80	90
1.4 km North of Lime Plant to Hwy 97 Junction	22	90	100

From/To: Squamish Valley Rd to Function Junction

System Length: . . . . . 40 km

Elevation Range: . . . . . 145 m to 600 m

Corridor Characteristics: 2 lane undivided highway with passing lanes

Existing Speed Limit . . . . . .80 and 90 km/h

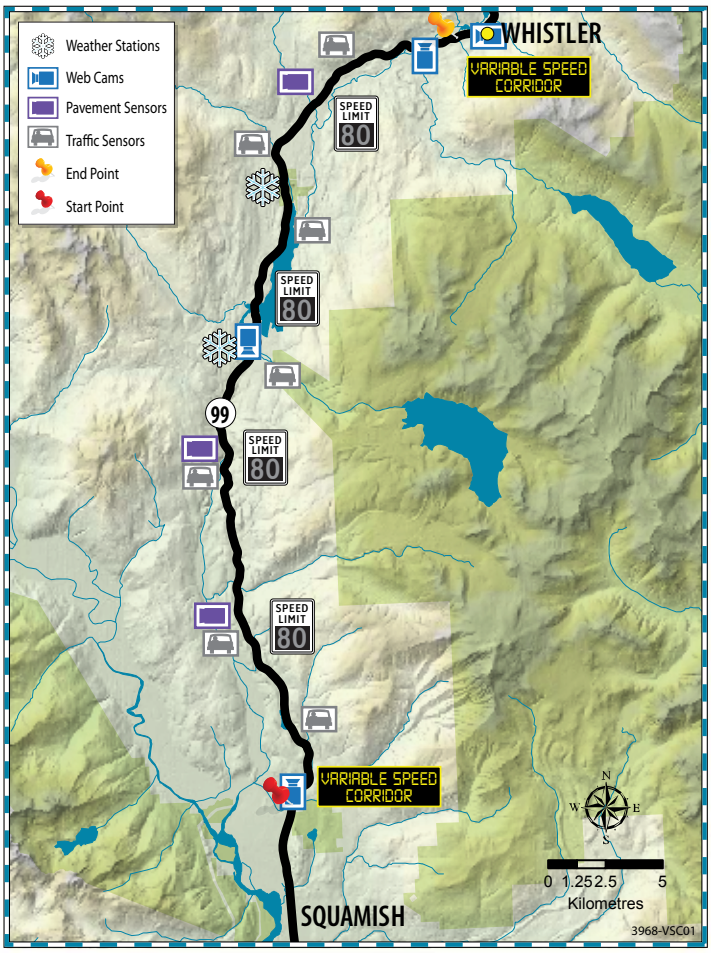
Existing Infrastructure:

- 2 road weather stations (Brandywine and Tantalus)
- 2 web cameras (Alice Lake and Garibaldi)
- 2 overhead variable message signs (one Northbound leaving Squamish and one Southbound leaving Whistler)

Infrastructure Needed:

- 8 pavement condition sensor stations
- 18 traffic sensor stations
- 18 variable speed signs

Anticipated Cost (planning level estimate): $3 M



Description

The Sea to Sky corridor is a 100 km long winding route between the mountains and ocean connecting Vancouver to Whistler. From near sea level in Squamish to an elevation of 675 m in Whistler, the highway climbs upward and winter weather can set in, surprising travellers who began their journey in good conditions. Conditions between Squamish and Whistler can vary greatly as the highway climbs upward and away from the moderating influence of the ocean.

The section of highway between Squamish and Whistler currently has two road weather stations, two web cams and two variable message signs.

A variable speed limit system between Squamish and Whistler will improve safety and mobility throughout the corridor and maintain smooth flow during unfavourable weather conditions by notifying drivers of adverse weather and road conditions. Even when adverse weather conditions are detected by drivers, knowing a safe operating speed for conditions is not always apparent. Besides weather conditions, the variable speed limit system can be used to adjust speeds for wildlife on the roadway, special events, to slow traffic approaching a crash scene, or for congestion.

Traffic and pavement sensors between Squamish and Whistler will monitor real-time traffic speeds and road conditions to provide information back to operatons staff. This information will then be used to proactively update electronic speed limit signs located along the corridor. A senior district official would have final decision making ability in modifying speed limits, but will be advised in that decision by the information provided by the road weather information stations (air temperature, wind speed and direction, and precipitation information), traffic sensors (vehicle speed information), and pavement sensors (roadway friction, visibility, and condition of the road surface).

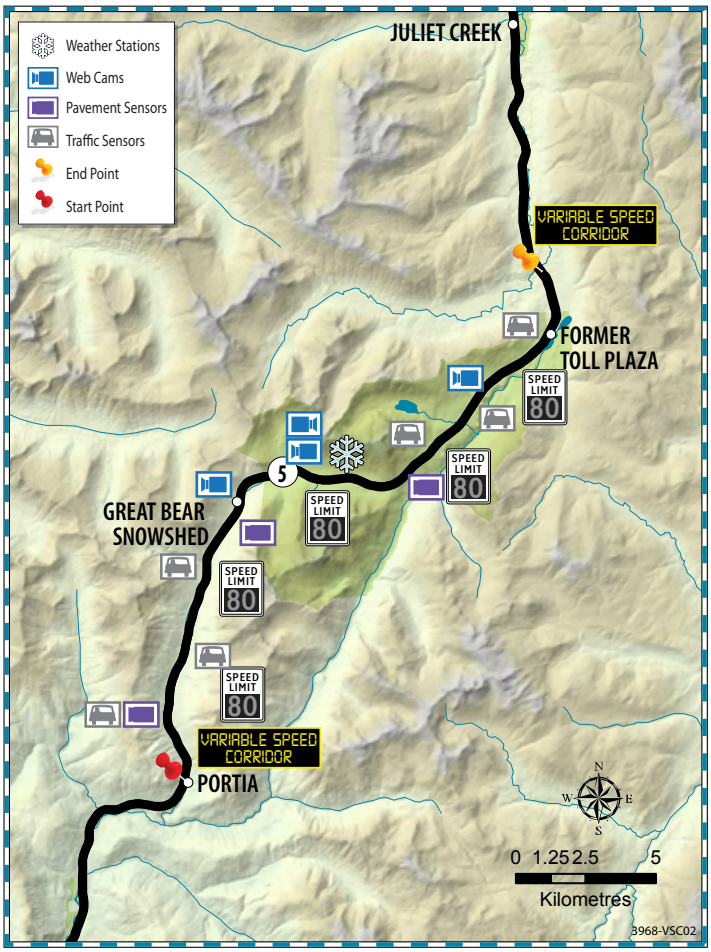
From-To: Portia Interchange to former Toll Plaza
System Length: . . . . . 24 km
Elevation Range: . . . . . 590 m to 1230 m
Corridor Characteristics: 4 divided lane freeway
Existing Speed Limit: . . . . . 110 km/h
Existing Infrastructure:

- 1 weather station at Coquihalla Summit (limited instrumentation)
- 4 web cameras (Great Bear Snowshed, 2 cams at Zopkios, Coquihalla Lakes)
- 1 Southbound variable message sign just north of former toll plaza location

Infrastructure Needed:

- 8 pavement condition sensor stations
- 12 traffic sensor stations
- 24 variable speed signs
- 1 variable message sign
- Upgrades to the existing Coquihalla Summit weather station

Anticipated Cost (planning level estimate): $4 M



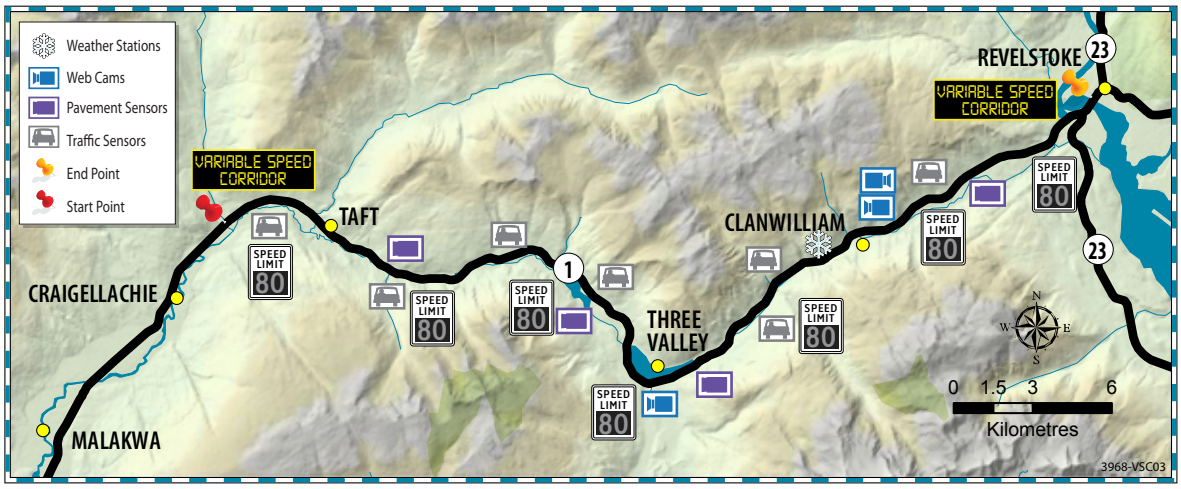
Description

The Coquihalla corridor is a 185 km long mountain highway connecting the south coast to the interior of British Columbia. The Coquihalla rises from an elevation of 250 m at the Nicolum interchange (outside Hope) to a peak of 1230 m at the Coquihalla Summit before descending to 750 m at the Highway 1 junction west of Kamloops. Due to the large elevation changes along the corridor, weather conditions can vary greatly. Along this route, the summit section from the Portia Interchange, through the Great Bear snowshed and up to the former Toll Plaza location presents the most challenging road conditions with heavy snowfall, blowing snow, and fog.

The section of highway between the Portia interchange and former Toll Plaza currently has one weather station at highway elevation, four web cams and one variable message sign.

A variable speed limit system for the Coquihalla will improve safety and mobility throughout the corridor and maintain smooth flow during unfavourable weather conditions by notifying drivers of adverse weather and road conditions. Even when adverse weather conditions are detected by drivers, knowing a safe operating speed for conditions is not always apparent.

Traffic and pavement sensors will monitor real-time traffic speeds and road conditions to provide information back to operations staff. This information will then be used to proactively update electronic speed limit signs located along the corridor. A senior district official would have final decision making ability in modifying speed limits, but will be advised in that decision by the information provided by the road weather information stations (air temperature and precipitation information), traffic sensors (vehicle speed information), and pavement sensors (roadway friction, visibility, and condition of the road surface).



From-To: Perry Creek Bridge to Highway 23 junction
System Length: . . . . . .40 km
Elevation Range: . . . . . 385 m to 570 m
Corridor Characteristics: 2 lane undivided highway with passing sections
Existing Speed Limit: . . . . . 90 and 100 km/h
Existing Infrastructure:

- 1 road weather station (Clanwilliam)
- 3 web cameras (3 Valley Gap, 2 web cams at Clanwilliam Railway Overpass)
- 1 Westbound variable message sign at Highway 23 junction

Infrastructure Needed:

- 8 pavement condition sensor stations
- 18 traffic sensor stations
- 18 variable speed signs
- 1 variable message sign

Anticipated Cost (planning level estimate): $4 M

Description

The Highway 1 corridor between Sicamous and Revelstoke is a 70 km long highway connecting the coast and interior of British Columbia to the rest of Canada. This corridor is a key component of the British Columbia economy as the major east-west connector for goods movement. This portion of highway includes challenging terrain subject to heavy snowfall and natural hazards including slope stability issues and snow avalanches. The Three Valley Gap area, located approximately 20 km west of Revelstoke, is one of the most challenging avalanche areas in the province and consists of eight avalanche paths within a 1 km section of highway.

The section of highway between the Perry Creek Bridge and Highway 23 junction currently has one road weather station, three web cams and one variable message sign in place.

A variable speed limit system for the Highway 1 corridor between Sicamous and Revelstoke will improve safety and mobility throughout the corridor and maintain smooth flow during unfavorable weather conditions by notifying drivers of adverse weather and road conditions. Even when adverse weather conditions are detected by drivers, knowing a safe operating speed for conditions is not always apparent. Besides weather conditions, the variable speed limit system could also be used to adjust speeds for wildlife on the roadway, special events, to slow traffic approaching a crash scene or for congestion.

Traffic and pavement sensors will monitor real-time traffic speeds and road conditions to provide information back to operations staff. This information will then be used to proactively update electronic speed limit signs located along the corridor. A senior district official would have final decision making ability in modifying speed limits, but will be advised in that decision by the information provided by the road weather information stations (air temperature and precipitation information), traffic sensors (vehicle speed information), and pavement sensors (roadway friction, visibility, and condition of the road surface).

Winter Tires

Background

British Columbia's mountain passes and interior regions can experience significant winter conditions that challenge both drivers and vehicles. The Ministry posts Winter Tire signs on routes requiring winter tires or chains during the time period October 1 through to 30 April. Vehicles not equipped with winter tires or carrying chains are prohibited from travelling past the signs.

Winter tires are not mandatory province-wide in B.C., and as more than 60% of the population lives in areas where snow conditions are not common, province-wide mandatory winter tires are not being recommended.

The Motor Vehicle Act (Section 208) currently has a broad definition of a winter tire dating back to 1979. Currently, a winter tire is defined as a tire that is represented by its manufacturer or tire retailer as a tire intended principally for winter use and that provides adequate traction in snow or mud. The Act also recognizes that winter tires must be in good condition, with a minimum tread depth of 3.5 millimetres.

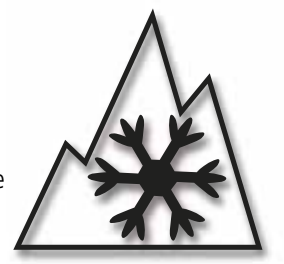
Advances in tire technology have resulted in various tires having the characteristics to meet the winter tire definition. The variety of tire types has raised questions from the public as to what is considered a winter tire.

A review of the current definition found that both Mud and Snow (M+S) and Mountain/Snowflake rated tires are captured by the existing legislation, but not explicitly stated.

Differences between M+S tires and Mountain/Snowflake Rated Tires

M+S

The Mud and Snow (M+S) designation was developed by the American Rubber Manufacturers Association to differentiate the geometry of tread patterns on tires. The M+S designation represents a tread pattern whose grooves were carried from the centre of the tire to "daylight" at the edge of the tire and where 25% of the tire tread contact surface is open. That tread pattern improves traction in both rain and snow in comparison to tires with a longitudinal tread pattern as found on a summer tire. Most All Season tires carry the M+S designation.



In the 1990s, Mountain/Snowflake rated tires were developed for improved performance in winter conditions. In order for a tire to earn a Mountain/Snowflake designation it must have the following characteristics:

- Provide traction at least 10% greater than the standard reference tire (M+S tire).
- Softer and pliable in lower temperatures (less than 7°C) as well as improving traction on ice

Because the winter mountain/snowflake tire test is a cumulative score in varied snow surface conditions (Soft Pack Snow, Medium Pack Snow, Medium Hard Pack Snow, Hard Pack Snow, and Ice) the 10% improvement may not indicate a superior winter tire for all winter surface conditions. With only a 10% improvement required, a tested tire might excel on one surface type but show no difference than an M+S rated tire for another surface but will still achieve the 10% improvement overall. That being said there are mountain/snowflake tires which exceed the standard by substantially more than 10%.

Best Practices Review for Winter Tires

A review of other jurisdictions, both in North America and Europe, where winter driving is common, found that winter tire/chain regulations vary widely and no consistent theme emerged. Of all jurisdictions surveyed, only Quebec and Oregon require Mountain/Snowflake rated tires with Oregon only requiring them when indicated by a dynamic sign on specific mountain passes. Oregon's approach requires significant police participation during storm events.

The review also found that other jurisdictions allow for more types of studded tires, tire chains, as well as other types of traction devices as alternatives to chains.

Safety Analysis

Winter crashes attributed to tire condition were reviewed for the time period 2003-2012. The results show that serious winter crashes attributed to tire condition have decreased 28%.

This decrease in tire condition related crashes indicates that drivers who do venture onto highways with winter conditions are better prepared and/or those who are not well prepared are choosing not to travel when conditions are poor. Public education campaigns focused on the need for vehicle and driver preparedness, such as the multi-agency "Shift Into Winter," along with highway condition messaging through DriveBC are having a positive safety effect.

Further safety analysis was conducted as to the appropriateness of the start and end dates for winter tire usage. Collisions which the police attributed to ice, slush, or snow on the road surface were tabulated per month over the 10 year period 2003-2012. The data indicated which months experienced substantial change in serious collisions. This analysis indicates that the current winter tire time period of October 1 through to 30 April could be adjusted to October 1 through to 31 March.

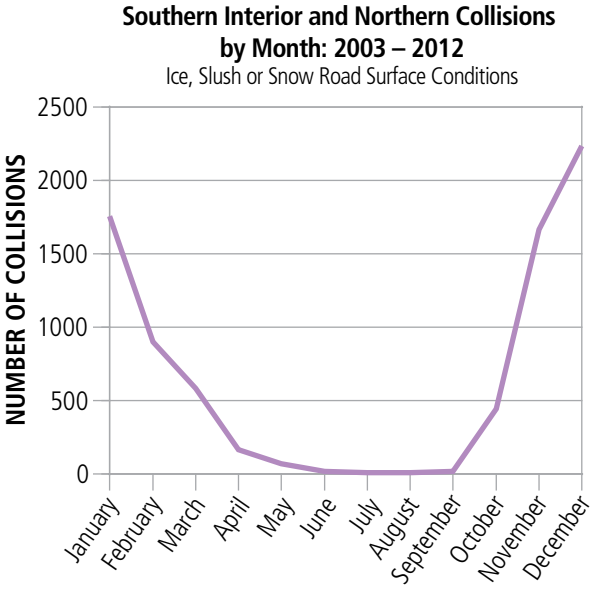


Figure 9: Ice, Slush or Snow Road Surface Condition Crashes

Public Consultation

The public consultation occurring through the winter of 2013/14, found that most respondents:

- Agree with the current October 1 to April 30 winter tire time period (68%)
- Change their tires seasonally for winter driving (69%)
- Use tires with the mountain snowflake symbol (63%)

A key theme from stakeholder meetings and a topic that arises in frequent questions from the public each fall is a desire for clarification of the winter tire definition and winter tire and chain requirements indicated on the signs.

Signs

The existing winter tire sign was found to be unclear as to requirements by vehicle type. To address these concerns and provide a clearer message a new winter tire sign was developed.

Existing Sign

New sign

Figure 10: Current vs. Recommended Winter Tire Signage

Winter Tire Recommendations

1. Update Legislative definition of winter tires:
   - Move from legislation to regulation to allow minister to set requirements as technology changes;
   - Current winter tire definition ***"advertised or represented by its manufacturer or a person in the business of selling tires to be a tire intended principally for winter use, and that provides, or is designed to provide, adequate traction in snow or mud"***;
   - Proposed winter tire definition *"a winter tire must be permanently labeled with the words "**mud and snow**" or any contraction using the letters "**M**" and "**S**"; or the **mountain/snowflake** symbol"*.
2. Update Regulations to modernize requirements for studded tires and chains to reflect new technology:
   - Revise number and type of studs per tire;
   - Include new types of chains in the definition.
3. Install new winter tire signs to clarify the requirements for winter tires and chains; and the timeframe for use.
   - Safety statistics show that April has very low number of winter condition related accidents.
4. Increase available resources to promote and improve winter safety through the multi-agency Shift into Winter campaign.

Slower Moving Vehicles

Background

Just as vehicles travelling too fast can cause safety issues on highways, so too can vehicles travelling too slow in comparison to other traffic. Slower-moving vehicles, such as recreational vehicles, vehicles towing others, or slow vehicles in the left-hand lane, reduce efficiency of a highway and increase driver frustration, which can result in erratic, unsafe passing behaviour.

There are various ways of ensuring the safety of all road users around slower vehicles while improving the efficiency of the highway. These measures include: signage directing slower vehicles to keep right on highways with two or more lanes, passing lanes at certain points on two-lane highways (and signs in advance of passing lanes) and pullouts where feasible.

Public Consultation

Throughout the fall and winter of 2013/14, public input was sought on 54 corridors representing approximately 9,100 km of rural highway throughout the province. For each corridor, the public was asked to indicate the degree to which they thought slower moving vehicles were a safety concern.

Public consultation found that people were generally divided across all regions on the degree that slower moving vehicles were a safety concern. The exception was the Highway 4, Parksville to Tofino corridor for which 70% of respondents expressed a slower moving vehicle concern.

Overall, there were requests for:

- more passing lanes,
- more "Keep Right Except to Pass" signs, and
- more driver education.

Slower Moving Vehicle Analysis

The B.C. Motor Vehicle Act (Sections 145 and 150) contains information about both slow driving and driving in the right hand lane. Legislation currently requires that "a person must not drive a motor vehicle at so slow a speed as to impede or block the normal and reasonable movement of traffic" and that "the driver of a vehicle proceeding at less than normal speed of traffic at the time and place and under the conditions then existing must drive the vehicle in the right hand lane". However many drivers do not consider themselves to be slow moving so long as they are travelling at or near the speed limit. Where speed limits are lower than the normal travel speed (i.e. less than the 85th percentile speed), this creates conflict and frustration among the reasonable majority of drivers and those who strictly obey the posted speed limit.

Best Practices Other Jurisdictions

Analysis of legislation from other jurisdictions (all Canadian provinces, 11 US states, United Kingdom, New Zealand and Australia), shows that B.C. laws are largely consistent with other jurisdictions on use of the right lane and slower vehicles. While some jurisdictions such as Ontario, Alberta, Washington, Australia, and New Zealand have more detailed laws on lane use when using a multi-lane roadway, their essence is the same.

A number of other jurisdictions restrict trucks from the left/passing lane. BC also currently has the capability to restrict the type of vehicle that is allowed in a lane however the use of these restrictions has been limited to areas where there have been clearly identified operational needs.

Signs

Currently, the Ministry uses a variety of signs to tell drivers to leave the left lane free for those who are travelling faster and wish to pass. However, "left lane campers" (drivers who travel continuously in the left lane despite travelling a relatively slow speed compared to others around them), are a commonly reported source of frustration. These drivers often do not recognize that they are an impediment or that they are contributing to an increased crash risk for themselves and those around them.

Another phenomena that has been observed are drivers that choose a very slow speed through winding sections of the highway and then speed up when the highway straightens out and passing is allowed. This behaviour limits other drivers' opportunities to pass, and increases those drivers' frustration.

Updating "Keep Right" signs that emphasize that drivers should keep right to let others pass may assist in improving driver behaviour.

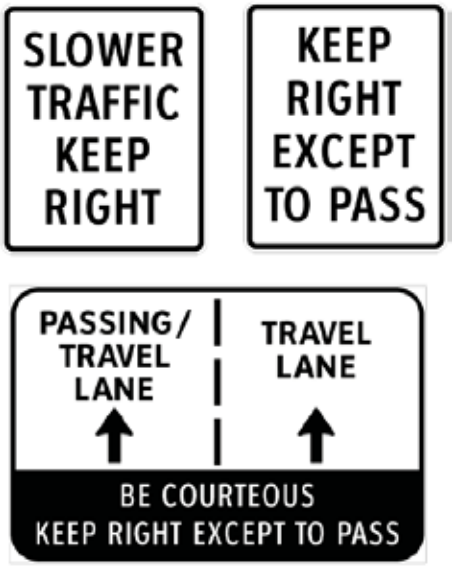


Figure 11 – Existing B.C. Signs for slower vehicles

Updated signs would be applied at the beginning of passing/ climbing lanes or where a multi-lane highway develops. The existing "Keep Right Except to Pass" signs would remain as a reminder to keep right, while other less direct signage such as "Slower Traffic Keep Right" would be discontinued over time as signs wear out.

Figure 12 – Updated Keep Right Sign

Pavement Marking

Passing opportunities are often limited due to the province's mountainous terrain. As part of recent highway upgrades, there have been 30 new passing lanes built, allowing drivers to safely pass slower moving vehicles. Construction of passing and climbing lanes is a costly but effective way to improve rural highway safety and mobility, and more passing lanes are planned for construction.

Currently, when a climbing or passing lane starts, there are no pavement markings used in B.C. to specifically direct drivers into the right hand lane. Other jurisdictions, including national pavement marking guidance from the Transportation Association of Canada, include a dashed continuity line at the beginning of passing lane to direct drivers into the right hand lane. When used with complimentary signs, such as the updated signage shown in Figure 12, these pavement markings will help enforce the "Keep Right Except to Pass" message.

Slower Traffic Using Pullouts

Due to BC's geography there are numerous two lane highways with limited passing opportunities. It is not uncommon for vehicles to form platoons behind slower moving vehicles. Current legislation states that *"A person must not drive a motor vehicle at so slow a speed as to impede or block the normal and reasonable movement of traffic"* (MVA, Sec 145 (1)). However, it does explicitly define how many vehicles need to be in the queue before the slow moving vehicle driver takes action.

Legislation is currently enacted in other West Coast jurisdictions such as Washington, Oregon and California defining when a slower moving vehicle needs to pull over. Legislation in Washington State requires that:
"On a two lane highway where passing is unsafe... a slow-moving vehicle, behind which five or more vehicles are formed in a line, shall turn off the roadway wherever sufficient area for a safe turn-out exists, in order to permit the vehicles following to proceed".

Figure 13 – Example Sign for Slow Vehicle Pullouts (Alaska)

The benefits of this type of requirement are:

- decreased delay and travel time;
- improved safety, as drivers are not tempted to pass when not safe;
- reduced driver frustration;
- drivers provided with clear indication of when they are considered to be impeding traffic; and
- increased awareness of the need to be courteous and allow vehicles to pass

Requiring slower moving vehicles to pull over and allow following vehicles to pass would be particularly beneficial in locations where there is a diverse mix of traffic and travel purposes.

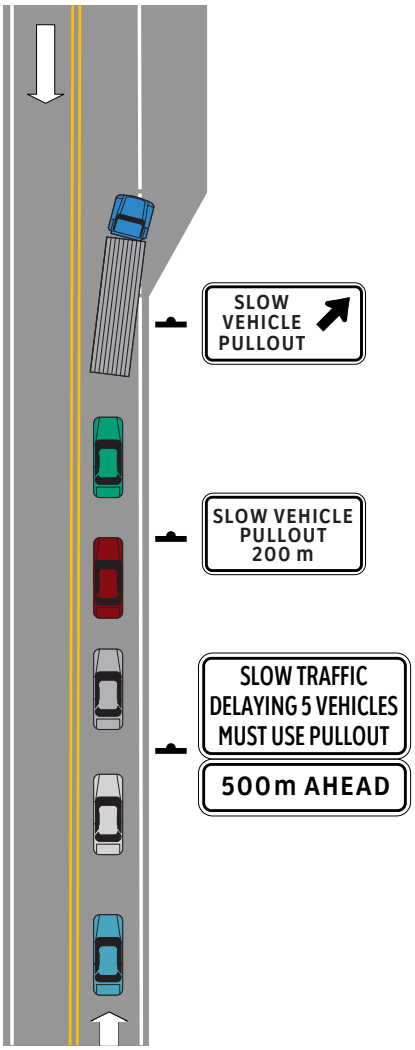


Figure 14 – Recommended Slow Vehicle Pullout Signing

Slower-Moving Vehicles Recommendations

The Public Consultation found that people were generally divided across all regions on the degree that slower-moving vehicles were a safety concern.

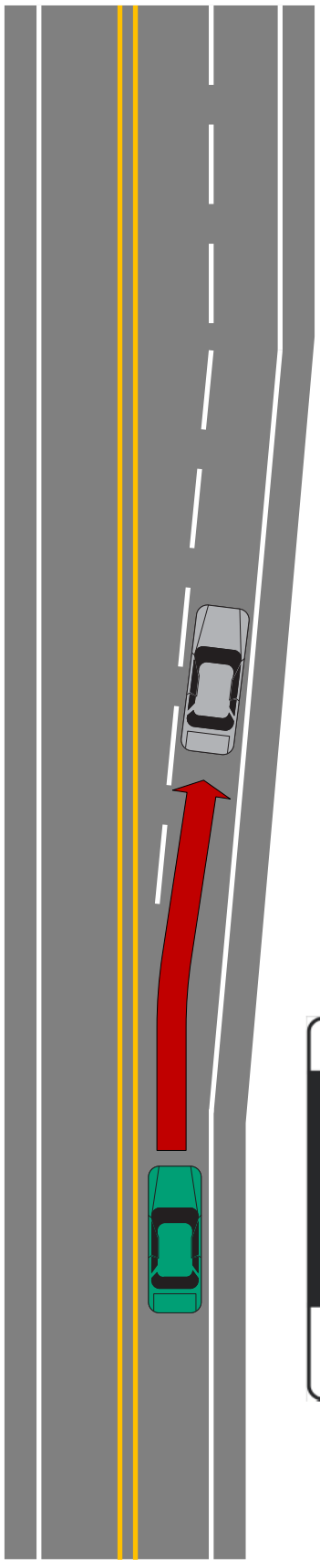
The exception was Hwy 4 Parksville to Tofino for which 70% of respondents expressed a slower-moving vehicle concern.

Overall there were requests for:

- more passing lanes,
- more "Keep Right Except to Pass" signs,
- more driver education.

Recommendations

1. Better **Keep Right** signs that emphasizes that drivers should keep right to let others pass.
2. Update passing/climbing lane marking to direct drivers to the right lane, and use updated signs.
3. Pilot **Slow Traffic Delaying 5 Vehicles Must Use Pullout** on Hwy 4 Parksville to Tofino.
4. Update Motor Vehicle Act to clarify **"Keep Right Except to Pass"** requirements.



Wildlife

Background

Wildlife on rural highways in B.C. represents a serious potential hazard to drivers.

The Ministry of Transportation and Infrastructure receives reports of approximately 5,500 wildlife collisions each year. Large animals, such as bear, deer, elk and moose, pose the greatest danger, due to their size. Each year throughout the province, there are on average, five fatalities and over 400 people are injured in wildlife-related motor vehicle collisions. Of these, three fatalities and approximately 300 injuries per year occur on rural highways. As wildlife collisions are reduced, not only are travellers saved, but so is B.C.'s wildlife.

There are various ways to reduce collisions between vehicles and wildlife, and there are a number of these mitigation measures in place on B.C. highways, including exclusion systems (fencing, over and under passes, gates, ungulate guards, etc.), roadside mowing and clearing, and advisory signage.

Public Consultation

Many participants indicated rarely or never finding wildlife as a concern in the:

- Lower Mainland,
- Okanagan,
- Trans-Canada/Coquihalla, and
- Vancouver Island.

Participants that felt somewhat more likely to find wildlife to be a safety concern in the:

- North,
- Central (Cariboo), and
- West Kootenay and Rocky Mountain areas.

Wildlife Collision Analysis

To identify and monitor areas where wildlife crashes occur, the Ministry has been operating a Wildlife Accident Reporting System (WARS) since the late 1970's. Species and location information is collected on "roadkilled" wildlife found along numbered provincial highways. Since regular vehicle collision reporting relies on police reports, and police do not always attend wildlife crashes, the WARS database provides a more complete picture of wildlife safety on B.C. highways.

Collision information shows that deer, elk and moose are the animals hit most often on B.C. highways. The areas in the province with the highest deer, elk and moose collision density are listed in Table 6:

Deer	Elk	Moose
Hwy 3: Fort Steele to Elko	Hwy 3: Fort Steele to Elko	Hwy 97: Dawson Creek to Fort St. John
Hwy 97: Williams Lake to Quesnel	Hwy 93: Wasa to Radium Hwy 3: Yahk to Cranbrook	Hwy 16: Prince George to Parsnip River
Hwy 97: 100 Mile House to Williams Lake	Hwy 3: Elko to Alberta Border	Hwy 97: Chetwynd to Dawson Creek

Table 6 – Highways with highest wildllife collisions

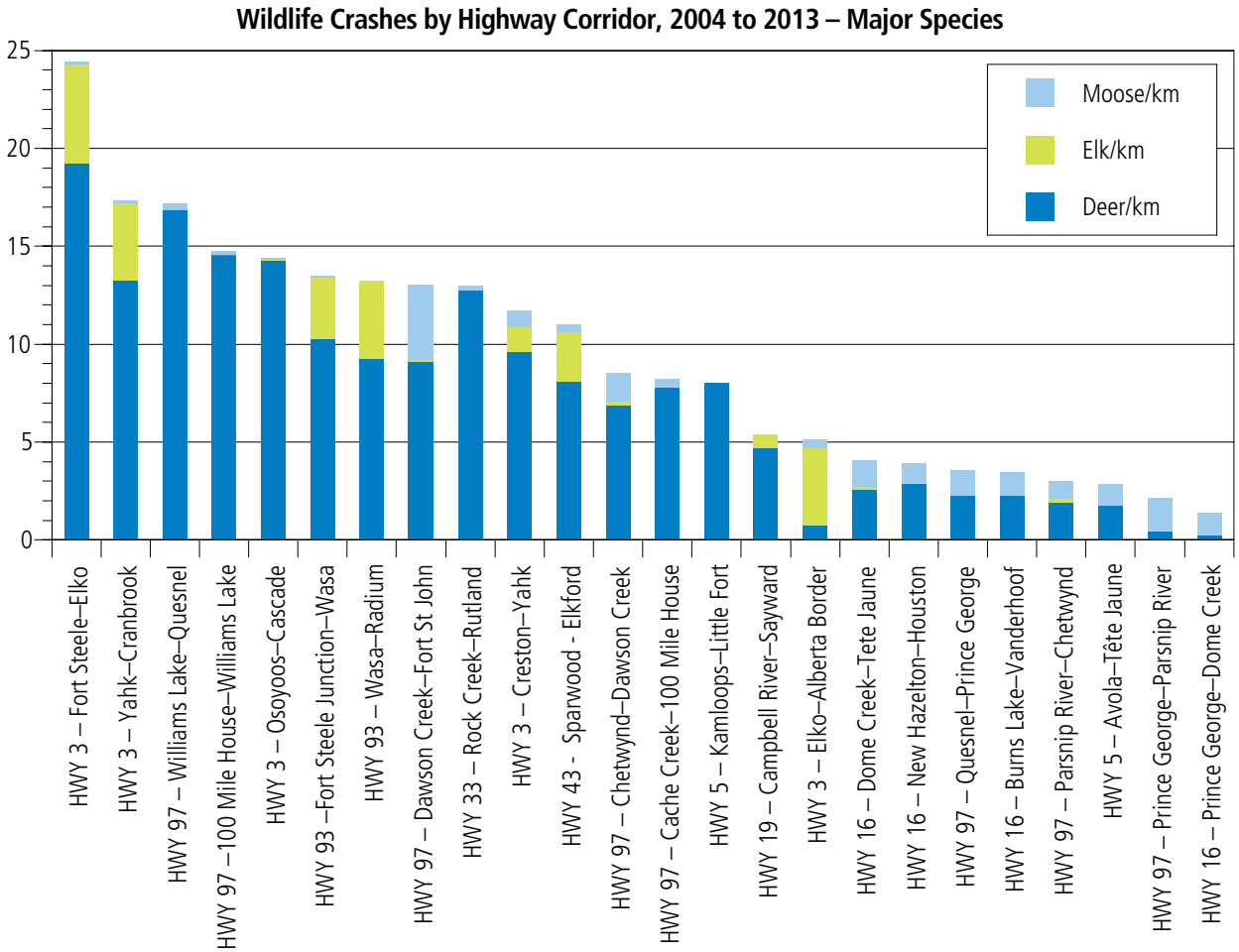


Figure 15 – Shows wildlife collisions by corridor

Deer are found throughout the province and can be found on any highway. Elk and Moose have more limited ranges with Elk more commonly found in the West Kootenay and Rocky Mountain districts, and Moose more commonly found in the North.

Wildlife exclusion systems, such as those found on Highway 5 (Coquihalla), Highway 97C (Okanagan Connector) and part of Highway 19 north of Parksville, are very effective at reducing wildlife collisions. However, these systems are very expensive and are most effective on limited access freeway type highways. Fencing is just one component of wildlife exclusion systems. Animal overpasses and underpasses are required in order to allow animal movement across the highway, one way gates and jump-outs are needed as an escape in case an animal does get on to the roadway, and gates or ungulate guards are needed where there are breaks in the fence due to side road or driveway accesses.

Wildlife detection systems are experimental, but show promise. These systems are designed to detect animals near highways and then advise drivers using activated warning signs.

Wildlife warning signs serve as a reminder to drivers to stay alert and watch for wildlife in areas where there are known to be specific species. Other jurisdictions have also successfully installed wildlife detection systems.

Ontario has two systems installed. Ministry of Transportation Ontario notes that for their Highway 17 site, north of Sault Ste. Marie no wildlife/vehicles collisions have been reported since the system was installed November 2013.

Results from an installation in Minnesota on Highway 23, 12 miles south of Marshall show a 57% reduction in Deer Vehicle Collisions in 2007 and 33% reduction in 2008.

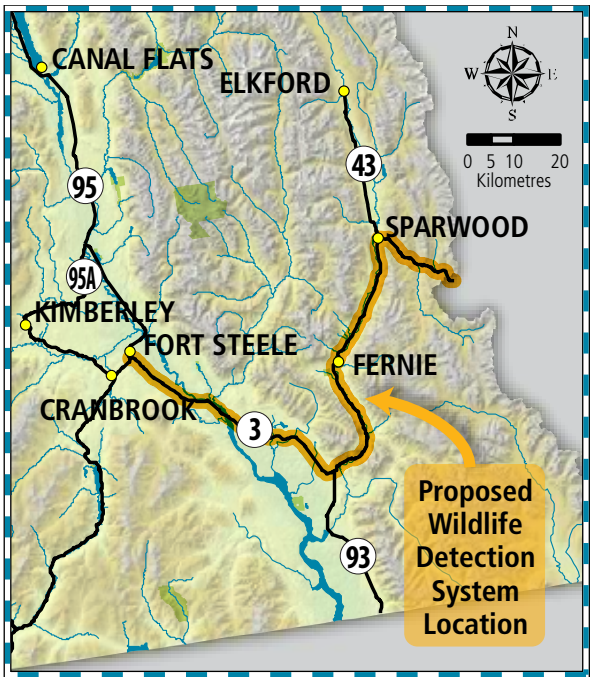
Wildlife Recommendations

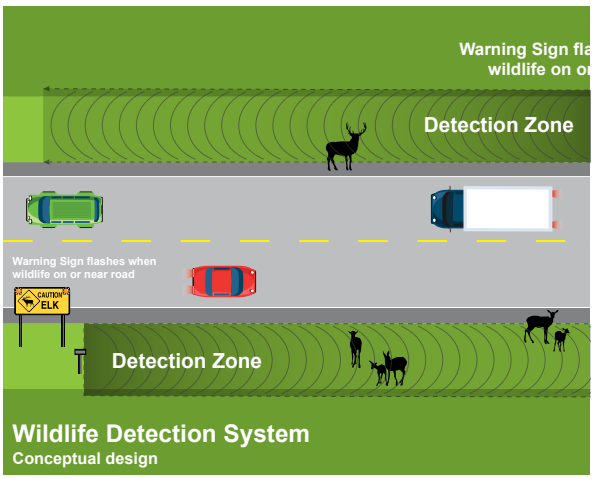
The public consultation indicated that participants did not often find wildlife as a significant concern in the South Coast and Southern Interior. Participants in the Central and Northern parts of the province felt somewhat more likely to find wildlife to be a safety concern.

The Wildlife Accident Reporting data indicates that wildlife accidents are prevalent and identifies a number of higher risk areas. This indicates that public education and warning of wildlife hazards needs to be improved.

Recommendations

1. Implement new gateway signs for longer highway segments to advise of the risk that large wildlife may be encountered.
2. Implement LED wildlife signs at specific locations in high wildlife accident areas to heighten awareness, and flash the LED's based on seasonal information.
3. Pilot two wildlife detection systems in corridors known as high wildlife accident areas:
   - Hwy 3 Fort Steele to Alberta border.
4. Increase the use of the DriveBC and the Changeable Message Sign system for real-time wildlife advisory messages.





Description

Highway 3 is the major route across southern British Columbia. In the southeast corner of the province the highway passes through the Elk Valley in the heart of the Canadian Rockies. The Elk Valley is characterized by a rich abundance of wildlife, including deer, elk, moose, bears and mountain sheep. The valley forms an important north-south corridor for wildlife between the northwestern corner of the United States and the Canadian Rockies in eastern British Columbia. The Elk Valley is also the largest producing coal field in the province. Thousands of workers commute on Highway 3 between the communities in the valley and the coal field daily. During the winter, thousands of skiers from B.C. and Alberta drive into the area.

On Highway 3, between Fort Steele and the Alberta Border, large wildlife represent a hazard to drivers. Over the period 2003 to 2012, on this 136 km section of Highway 3, 603 elk were reported killed. Large numbers of elk congregate in the area from late fall to early spring. Approximately 70% of elk were killed between October and March, a period when driving conditions are most severe. Approximately 60% of deer were killed between April and September, a period when many tourists travel through the area. While conventional wildlife warning signs are used to advise drivers of potential elk hazards, this section of Highway 3 has the highest rate of elk killed per km of any B.C. highway.

Conclusion

Given the high number of wildlife-vehicle accidents in the East Kootenay area, it is recommended a wildlife detection system be installed on Highway 3. The system will use sensors to identify when large wildlife approach the shoulder of the highway. When the detection system determines a large animal is present, the system will trigger flashing lights on a warning sign to alert drivers of the potential hazard ahead. Drivers can lower their speed and reduce their potential conflict with wildlife.

Estimated system cost: $1.5M

APPENDIX A: SPEED LIMIT CHANGES BY HIGHWAY

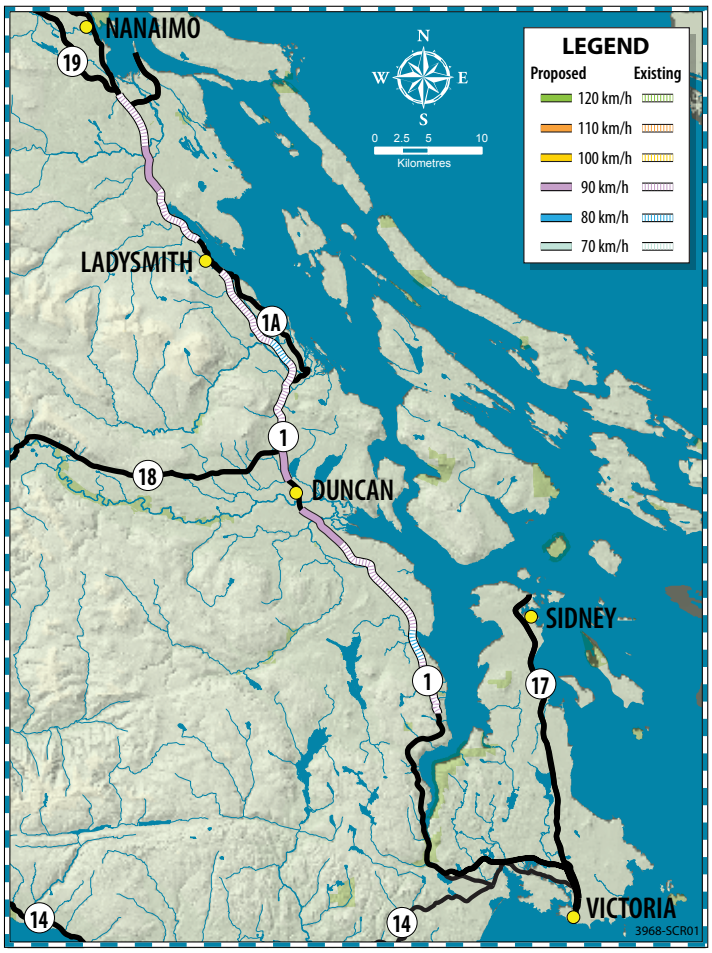
Cowichan Bay to Nanaimo

Physical Characteristics

Start Point 1: Bench Road
End Point 1: Allenby Rd
Length . . . . . 2.7 km
Start Point 2: North of Sherman Rd
End Point 2: Sprott Rd
Length . . . . . 3.6 km
Start Point 3: Timberlands Rd
End Point 3: Nanaimo River Bridge
Length . . . . . 3.1 km
Total length . . . . . 9.4 km
Number of Lanes. 4
Divided . . . . . Yes

Operational Characteristics

Average Daily Traffic 22,000
% Trucks. 4%
Safety: Serious summer crashes trending down by 15%
Current Speed Limit . . . . . 80/90 km/h
85th Percentile Speed . . . . . 100 km/h
Public Consultation Support 66%
Recommendation: Recommended increase (80 sections to 90)



Description

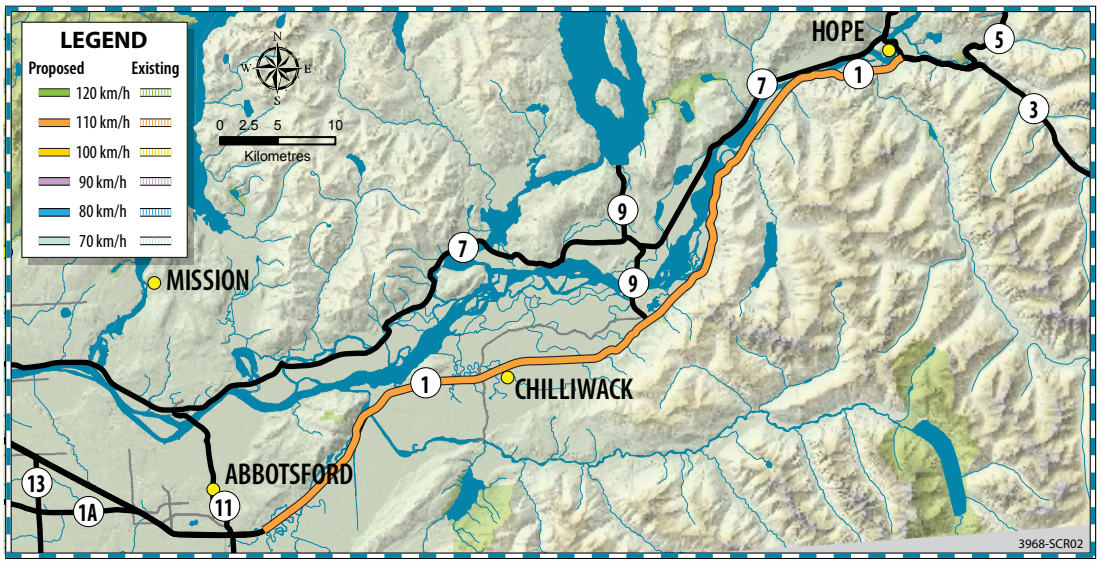
On Vancouver Island, Highway 1 is the major highway connecting Victoria to Nanaimo.

Between Cowichan Bay and Nanaimo, it is a four (4) lane, divided highway over gently rolling terrain. Major access points are controlled by intersections with traffic signals and advance warning flashers. As the corridor has been upgraded over time the speed limits have incrementally been changed resulting in numerous changes in speed limits. Within this 43 km segment there are a number of different 80 and 90 km/h speed limits. The travel speeds are relatively consistent over the corridor.

Conclusion

It is recommended that three short highway segments currently posted at 80 km/h be increased to 90 km/h for these factors:

- the 90 km/h speed limit will improve the speed limit consistency with adjoining segments,
- measured 85th percentile speed is 20 km/h above the posted speed of 80 km/h,
- summer serious crashes have been trending downwards with a 15% reduction since 2003.



Whatcom Rd to Hope

Physical Characteristics

Start Point: Whatcom Rd (Exit 95)

End Point: Highway 3 Junction (Exit 170)

Length . . . . . .74 km

Number of Lanes. 4

Divided . . . . . Yes

Operational Characteristics

Average Daily Traffic 17,000

% Trucks. 18%

Safety: Serious summer crashes trending down by 10%

Current Speed Limit . . . . . 100 km/h

85th Percentile Speed . . . . . 116 km/h

Public Consultation Support 86%

Recommendation: 110 km/h

Description

Highway 1 (Abbotsford to Hope) is the major travel gateway for commuters, goods movement and visitors making their way between the south coast and the interior of the province

The highway terrain is generally level. It is a controlled access highway that is predominantly two lanes in each direction separated by a median. Drivers can only enter and exit at the interchanges. Each interchange has acceleration and deceleration lanes to accommodate speed changes for traffic.

Conclusion

It is recommended that the posted speed limit be increased to 110 km/h for these factors:

- measured 85th percentile speed is 16 km/h above the posted speed of 100 km/h,
- the highway is a controlled-access, multi-lane, divided facility, and
- summer serious crashes have been trending downwards with a 10% reduction since 2003.

Hope to Boston Bar

Physical Characteristics

Start Point: 1 km east of Lake of the Woods Rest Area

End Point: 1.2 km west of Maintenance Yard in Boston Bar

Length . . . . . .55 km
Number of Lanes. 3
Divided . . . . . No

Operational Characteristics

Average Daily Traffic 3,000
% Trucks. 30%
Safety: Too few serious summer crashes to determine a trend
Current Speed Limit . . . . . 80/90 km/h
85th Percentile Speed . . . . . 107 km/h
Public Consultation Support 65%

Recommendation: 100 km/h

Boston Bar to Jackass Mountain

Physical Characteristics

Start Point: 420 m east of Northbend Ferry Rd

End Point: 820 m east of Falls Creek

Length . . . . . .24 km
Number of Lanes. 2/4
Divided . . . . . No

Operational Characteristics

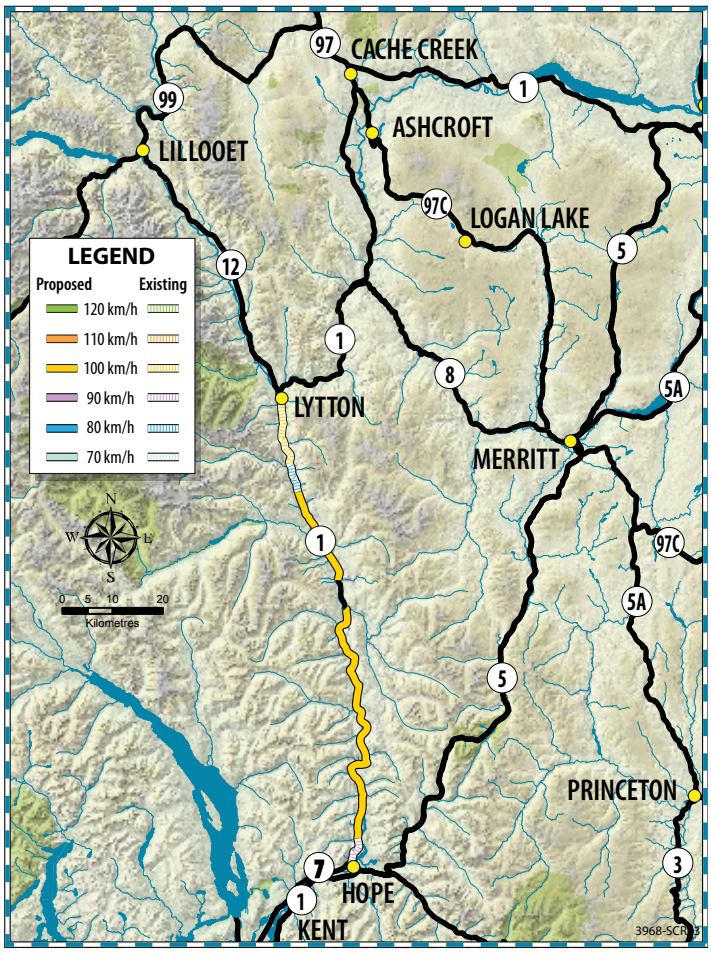
Average Daily Traffic 3,000
% Trucks. 30%
Safety: Too few serious summer crashes to determine a trend
Current Speed Limit . . . . . 90 km/h
85th Percentile Speed . . . . . 116 km/h
Public Consultation Support 65%

Recommendation: 100 km/h

Description

Highway 1 (Hope to Jackass Mountain) is an undivided highway that connects Fraser Valley communities to the Interior and the North.

The majority of the highway is one lane in each direction with passing and climbing lanes. This is a controlled access highway without interchanges, but with at grade intersections and accesses. The terrain is mountainous.



The average daily traffic volume is approximately 2,700 vehicles per day with about 30% being truck traffic.

The existing speed limit on Highway 1, between Hope and Jackass Mountain Summit, ranges from 80 km/h to 90 km/h over 86 km.

Conclusion

Speed limit changes are recommended:

- Lake of the Woods to Boston Bar from 80 km/h and 90 km/h to 100 km/h; and
- Boston Bar to Jackass Mountain from 90 km/h to 100 km/h.

The 85th percentile speeds are approximately 15 km/h over the posted speed limit.

There are very few access points along the highway.

Speed limits will not change within the communities of Yale and Boston Bar.

Tobiano to Savona

Physical Characteristics

Start Point: Savona Station Rd

End Point: Six MIle Rest Area

Length . . . . . .12 km

Number of Lanes. 2

Divided . . . . . No

Operational Characteristics

Average Daily Traffic 3,500

% Trucks. 17%

Safety: Too few serious summer crashes to determine a trend

Current Speed Limit . . . . . 90 km/h

85th Percentile Speed . . . . . 104 km/h

Public Consultation Support 60%

Recommendation: 100k/m

Description

Highway 1 from Cache Creek to Kamloops is a major highway connection from the Cariboo and South Coast to the Interior.

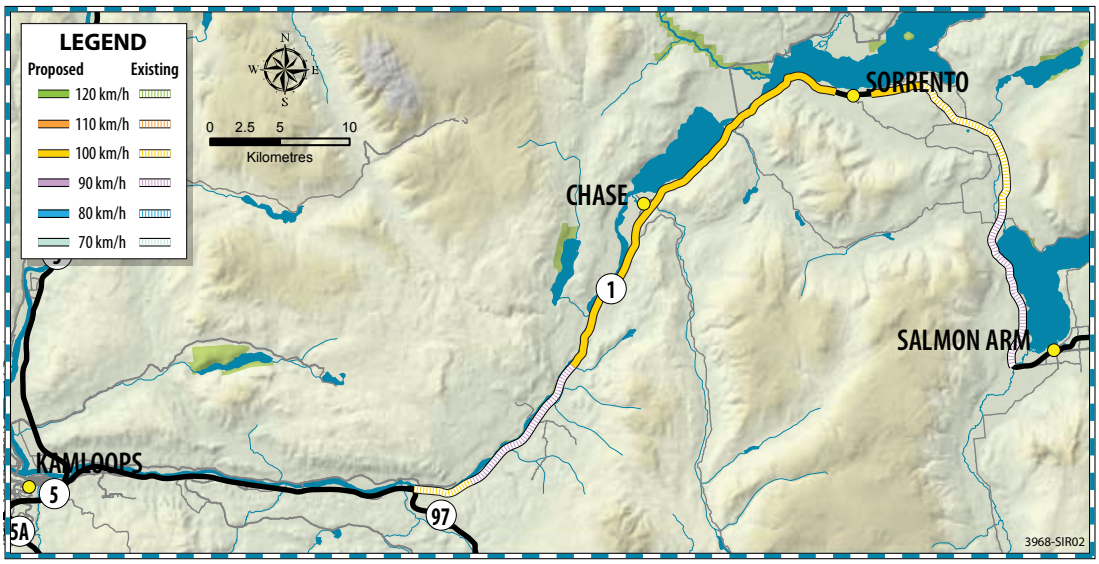
This segment of the TCH carries, on average, 3,500 vehicles every day with 17% being heavy truck volumes. The overall length of the segment is about 80 km with ~68 km being posted at 100 km/h and ~12 km segment is posted at 90 km/h between Tobiano and Savona. The majority of the segment is a two-lane undivided highway with few passing lanes as well as passing opportunities. The yellow center-line has rumble strips while 6 Mile Hill was upgraded with roadside delineators through regional safety program and warning signs between Deadman Creek and Kamloops were upgraded in 2012.

The number of accesses and intersection are consistent throughout this segment between the 100 km/h and 90 km/h zones. The intersections with relatively higher traffic volumes have auxiliary turn lanes on this segment.

Conclusion

It is recommended that the posted speed limit over the 12 km segment between Tobiano and Savona be increased to 100 km/h for these factors:

- measured 85th percentile speed within the 90 km/h zone is 16 km/h above the posted, and
- this increase will result in consistent speed limits between Cache Creek and Kamloops at a length of ~80 km.



Chase to Sorrento (Hilltop)

Physical Characteristics

Start Point: Willow Rd

End Point: Hilltop Rd

Length . . . . . .25 km

Number of Lanes. 2

Divided . . . . . No

Operational Characteristics

Average Daily Traffic 9,000

% Trucks. 18%

Safety: Serious summer crashes trending down by 52%

Current Speed Limit . . . . . 90 km/h

85th Percentile Speed . . . . . 105 km/h

Public Consultation Support 71%

Recommendation: 100 km/h

Description

Highway 1 (TCH) from Kamloops to Salmon Arm is a major highway connection between two major population centres. The TCH also provides primary connection between Alberta and the lower mainland through the interior

This segment of the TCH carries, on average, 9000 vehicles every day with 18% being heavy trucks. The segment between Chase and Hilltop Road is currently posted at 90 km/h. There is an existing 11 km segment posted at 100 km/h east of Hilltop Road while west of Chase there are various 4-laning capital expansion projects underway.

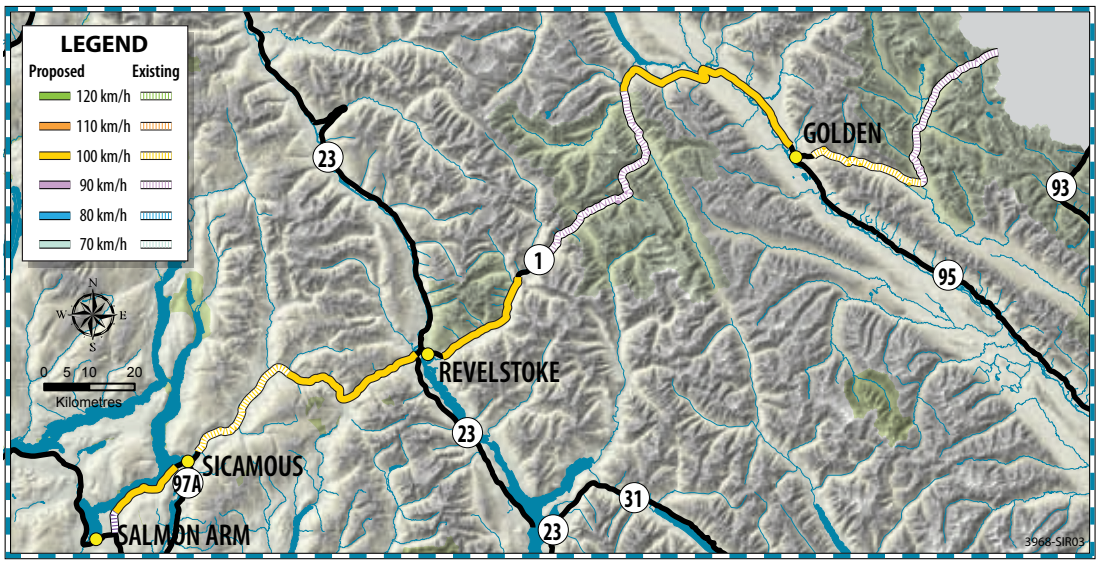
The majority of the segment between Chase and Hilltop Road is a two-lane undivided highway with few passing lanes as well as passing opportunities. The yellow center-line has rumble strips where double solid yellow lines exist.

The access and intersection frequency is dispersed and consistent with other highway systems in the interior where 90-100 Km/h speed is posted.

Conclusion

It is recommended that the posted speed limit over 25 km segment between Chase and Hilltop Road be increased to 100 km/h for these factors:

- measured 85th percentile speed within the 90 km/h zone is 15 km/h above the posted,
- this increase will result in consistent speed limits between Chase and Tappen at a length of 43 km. The 60 km/h through Sorrento will remain unchanged.



Salmon Arm to Revelstoke

Physical Characteristics

Start Point: Canoe (70th St. NE)

End Point: Hwy 23S

Length . . . . . .58 km

Number of Lanes. 2/4

Divided . . . . . No

Operational Characteristics

Average Daily Traffic 6,000

% Trucks. 24%

Safety: Overall corridor serious summer crashes trending down by 4%

Current Speed Limit . . . . . 90/100 km/h

85th Percentile Speed . . . . . 106 km/h

Public Consultation Support 54%

Recommendation: Increase (90 sections to 100)

Description
Salmon Arm to Revelstoke

Highway 1 (TCH) from Salmon Arm to Revelstoke is a major highway connection between two major population centers. The TCH also provides primary connection between Alberta and the Lower Lainland through the Interior. This segment of the TCH carries, on average, 6000 vehicles every day with 24% being heavy trucks.

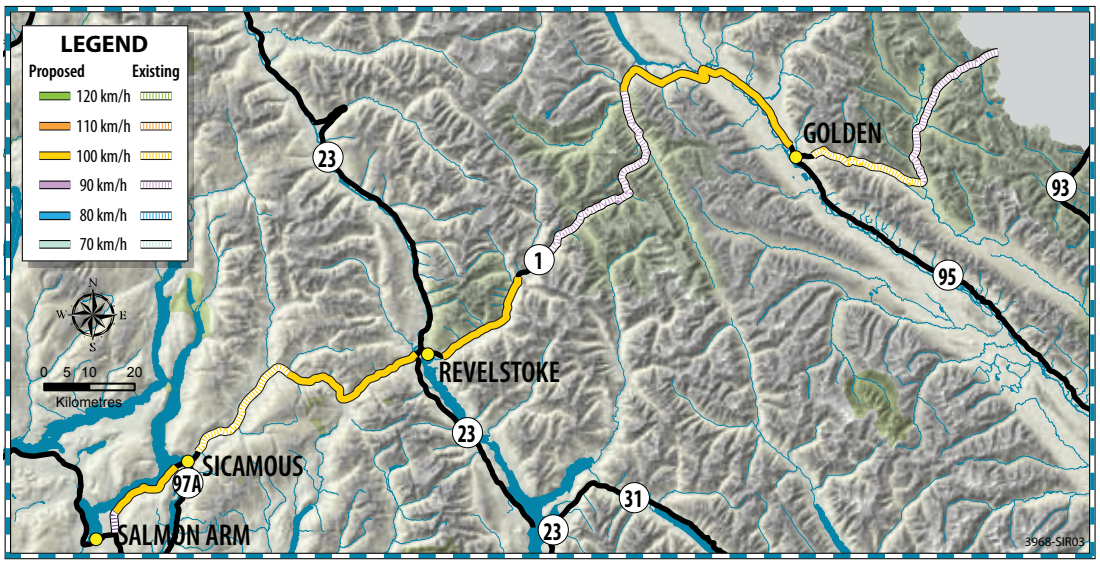
The segment between Canoe and Sicamous is currently posted at 90 km/h. There is an existing 29 km long segment posted at 100 km/h east of Sicamous to Malakwa while east of Malakwa is a 90 km/h zone up to Revelstoke.

The majority of the segment between Canoe and Sicamous and east of Malakwa is a two-lane undivided highway with few passing lanes as well as passing opportunities. The access and intersection frequency is dispersed and consistent with other highway systems in the interior where 90–100 km/h speed is posted.

Conclusion

It is recommended that the posted speed limit over 58 km segment be increased to 100 km/h for these factors:

- measured 85th percentile speed within the 90 km/h zone is 16 km/h above the posted,
- this increase will result in consistent speed limits between Canoe and Revelstoke at a length of 87 km. The 60 km/h through Sicamous will remain unchanged.



Revelstoke to Golden

Physical Characteristics

Start Point: Hwy 23N

End Point: Golden (Anderson Rd)

Length . . . . . 101 km

Number of Lanes. 2

Divided . . . . . No

Operational Characteristics

Average Daily Traffic 5,400

% Trucks. 26%

Safety: Overall corridor serious summer crashes trending down by 4%

Current Speed Limit . . . . . 90 km/h

85th Percentile Speed . . . . . 103 km/h

Public Consultation Support 61%

Recommendation: 100 km/h

Description Revelstoke to Golden

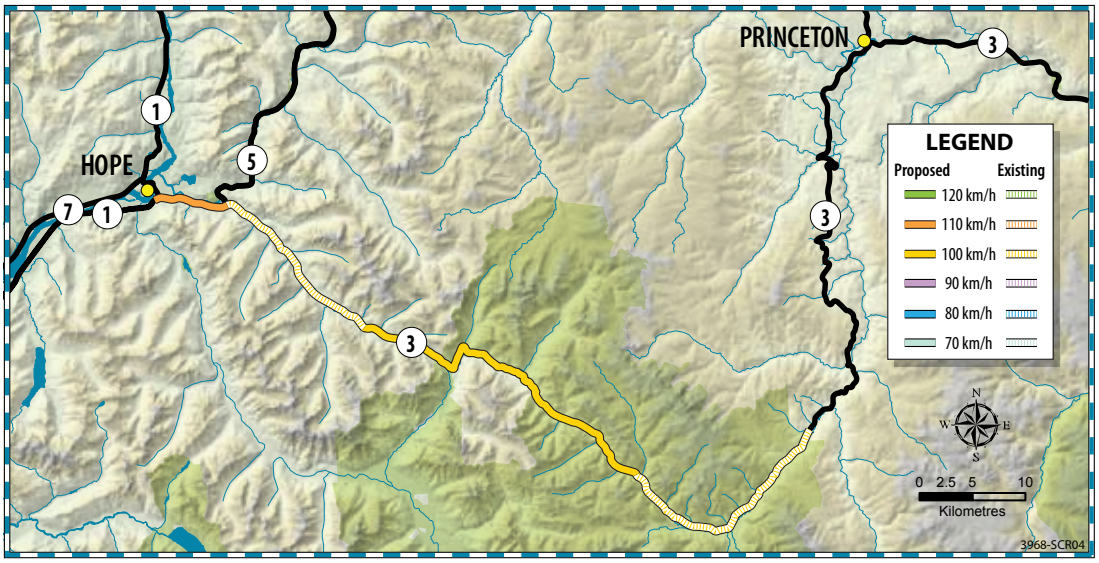
Highway 1 from Revelstoke to Golden is a major highway connection between major population centers as it traverses through Rogers Pass of National Glacier Park in Columbia-Shuswap. This segment also provides primary connection between Alberta and the Lower Mainland through the Interior. This segment of the TCH carries, on average, 5,400 vehicles every day with 26% being heavy trucks.

The segment between Revelstoke and Golden is currently posted at 90 km/h. The majority of the segment is a two-lane undivided highway with few passing lanes as well as passing opportunities. The access and intersection frequency is dispersed and consistent with other highway systems in the interior where 90-100 km/h speed is posted.

Conclusion

It is recommended that the posted speed limit over 101 km segment be increased to 100 km/h for these factors:

- measured 85th percentile speed within the 90 km/h zone is 13 km/h above the posted,
- this increase will result in consistent speed limits at a length of ~190 km between Canoe and Golden. The speed limits through communities like Sicamous, Revelstoke and Golden will remain unchanged.



Hope to Coquihalla

Physical Characteristics

Start Point: Start of Hwy 3 (Exit 170)

End Point: Hwy 5 Junction (Exit 177)

Length . . . . . .7 km

Number of Lanes. 6

Divided . . . . . Yes

Operational Characteristics

Average Daily Traffic 13,700

% Trucks. 20%

Safety: Overall Hope to Princeton corridor serious summer crashes trending down by 68%

Current Speed Limit . . . . . 100 km/h

85th Percentile Speed . . . . . 114 km/h

Public Consultation Support 68%

Recommendation: 110 km/h

Description

Highway 3 is an un-divided highway that connects the south coast and Alberta. The majority of the highway is one lane in each direction with passing and climbing lanes.

Highway 3 is a controlled access highway without interchanges but with at grade intersections and accesses.

The terrain is mountainous.

The existing speed limit on Highway 3, between Hope and Manning Park, ranges from 80 km/h to 100 km/h over 134 km.

Sunshine Valley to Manning Park East Boundary

Physical Characteristics

Start Point: End of 4 Lane (1.2 km west of Manning Park West Gate)

End Point: 500 m East of Allison Pass Maintenance Yard

Length . . . . . .33 km

Number of Lanes. 2

Divided . . . . . No

Operational Characteristics

Average Daily Traffic 2,300

% Trucks. 13%

Safety: Serious summer crashes trending down by 68%

Current Speed Limit . . . . . 80/90 km/h

85th Percentile Speed . . . . . 103 km/h

Public Consultation Support 68%

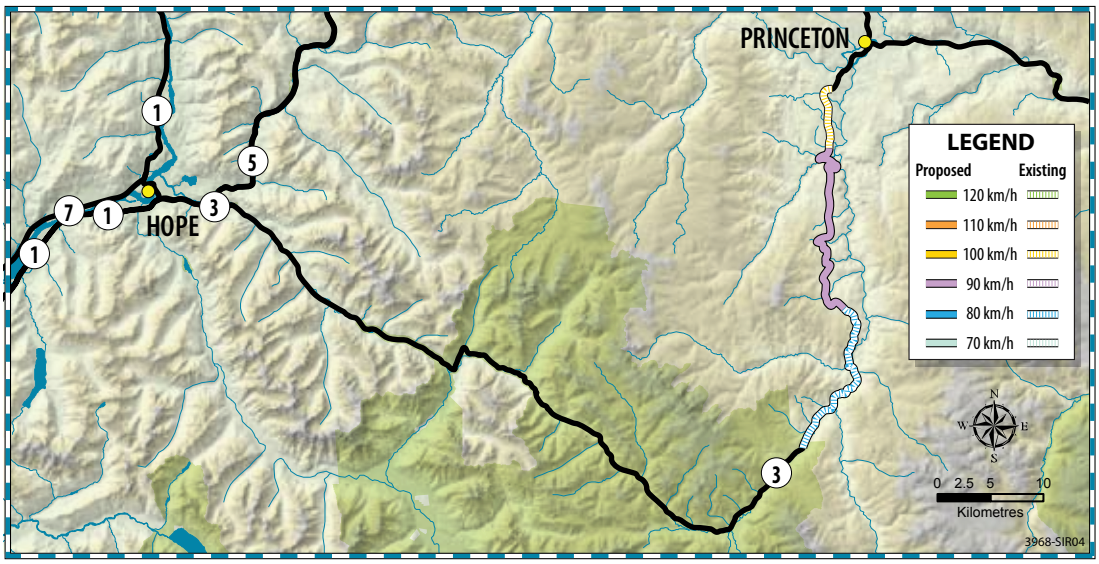
Recommendation: 100 km/h

Conclusion

Speed limit changes are recommended from Hope to the Coquihalla from 100 km/h to 110 km/h, over the length of 7 km; and Sunshine Valley to Manning Park East Boundary from 80 km/h and 90 km/h to 100 km/h.

The 85th percentile speeds are approximately 15 km/h over the posted speed limit. Summer serious crashes have been trending down significantly.

The section of Highway 3 between Hope and the Coquihalla is a controlled access, multi-lane divided facility.



Sunday Summit to Princeton

Physical Characteristics

Start Point: Sunday Summit

End Point: Whipsaw Creek

Length . . . . . .22 km

Number of Lanes. 2

Divided . . . . . No

Operational Characteristics

Average Daily Traffic 2,300

% Trucks. 13%

Safety: Serious summer crashes trending down by 59%

Current Speed Limit . . . . . 80 km/h

85th Percentile Speed . . . . . 103 km/h

Public Consultation Support 68%

Recommendation: 90 km/h

Description

Highway 3 Hope to Princeton is the major highway connection from the South Coast to the Interior. The highway generally follows the Similkameen River as it traverses the Cascade Mountains. Highway 3 is a two lane undivided highway with passing lanes. The yellow centre-line has rumble strips.

West of Princeton there is a 22 km section from Sunday Summit to Whipsaw Creek. East of Whipsaw Creek the speed limit is 100 km/h while west of Sunday Summit the speed limit is 80 km/h, as it is a more curvilinear (winding) section of highway.

There are very few accesses or intersections along this segment. The highway carries, on average, 2,300 vehicles every day with 13% being heavy truck traffic.

Conclusion

It is recommended that the posted speed limit be increased to 90 km/h for these factors:

- measured 85th percentile speed is 23 km/h above the current speed,
- summer serious crashes have been trending downwards with a 59% reduction since 2003.

Hope to Kamloops

Physical Characteristics

Start Point: Othello Interchange

End Point: Hwy 1 junction

Length . . . . . 180 km

Number of Lanes. 4

Divided . . . . . No

Operational Characteristics

Average Daily Traffic–Hope to Merritt 10,600

% Trucks. 22%

Average Daily Traffic–Merritt to Kamloops 7,800

% Trucks. 22%

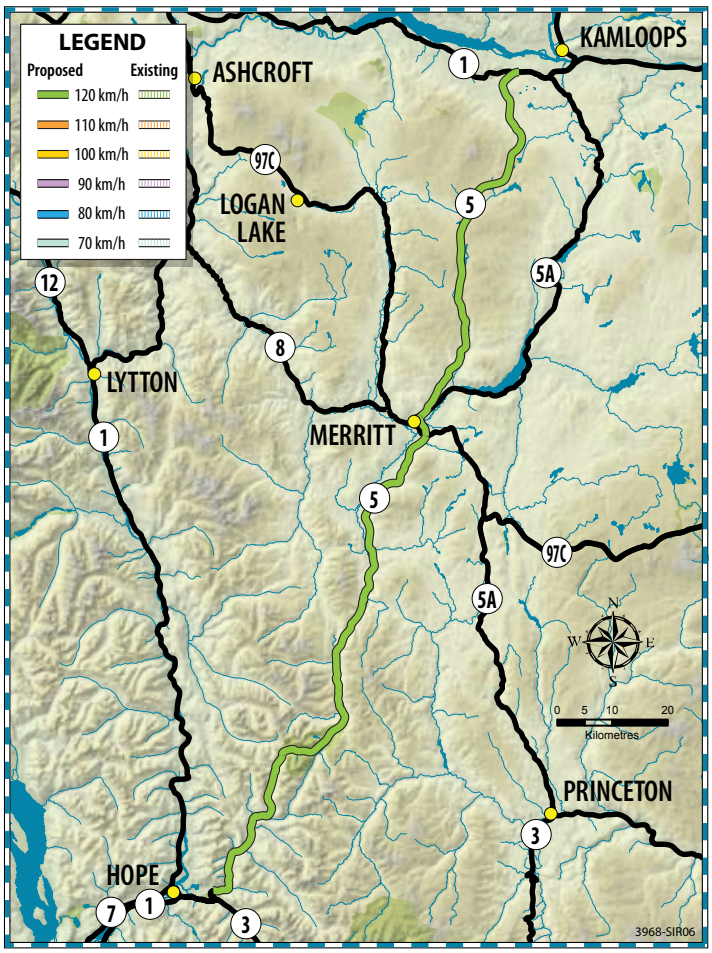
Safety: Serious summer crashes trending down by 22%

Current Speed Limit . . . . . 110 km/h

85th Percentile Speed . . . . . 127 km/h

Public Consultation Support 77%

Recommendation: 120 km/h



Description

Hwy 5, the Coquihalla is a high speed divided highway that connects the South Coast to the Interior. The Coquihalla Highway was built in three phases. Phase I, from Hope to Merritt, was completed in 1986. This involved some 137 kilometres of heavy construction through a mountain pass and hill country. Phase II, from Merritt to Kamloops, opened in 1987. The third phase, the Okanagan Connector, running from Merritt to Peachland was completed in 1990.

The majority of the highway is 2 lanes in each direction with additional truck lanes on the longer uphill and downhill grades. The current posted speed limit is 110 km/h.

The Coquihalla is a controlled access highway where drivers can only get on and off at interchanges. Each interchange has acceleration and deceleration lanes to accommodate higher speed limits. The over-all highway design standard used for the Coquihalla was examined and found capable of accommodating an increase in speed limit of 10 km/h.

The Coquihalla has wildlife exclusions systems to prevent animals from venturing onto the highway but also allows animals to cross from one side to another using wildlife overpasses and underpasses.

Relative to all the freeway and expressway systems in the province the Coquihalla is the highest level of freeway facility in the province of British Columbia.

Conclusion

It is recommended that the posted speed limit between Othello Interchange and Kamloops be increased to 120 km/h for these factors:

- measured 85th percentile speed is 17 km/h above the posted speed of 110 km/h,
- summer serious crashes have been trending downwards with a 22% reduction since 2003,
- the highway is a controlled-access, multi-lane, divided facility.

Heffley to Little Fort

Physical Characteristics

Start Point: Tod Mountain Rd

End Point: Hwy 24 junction

Length . . . . . .67 km

Number of Lanes. 2

Divided . . . . . No

Operational Characteristics

Average Daily Traffic 5,000

% Trucks. 15%

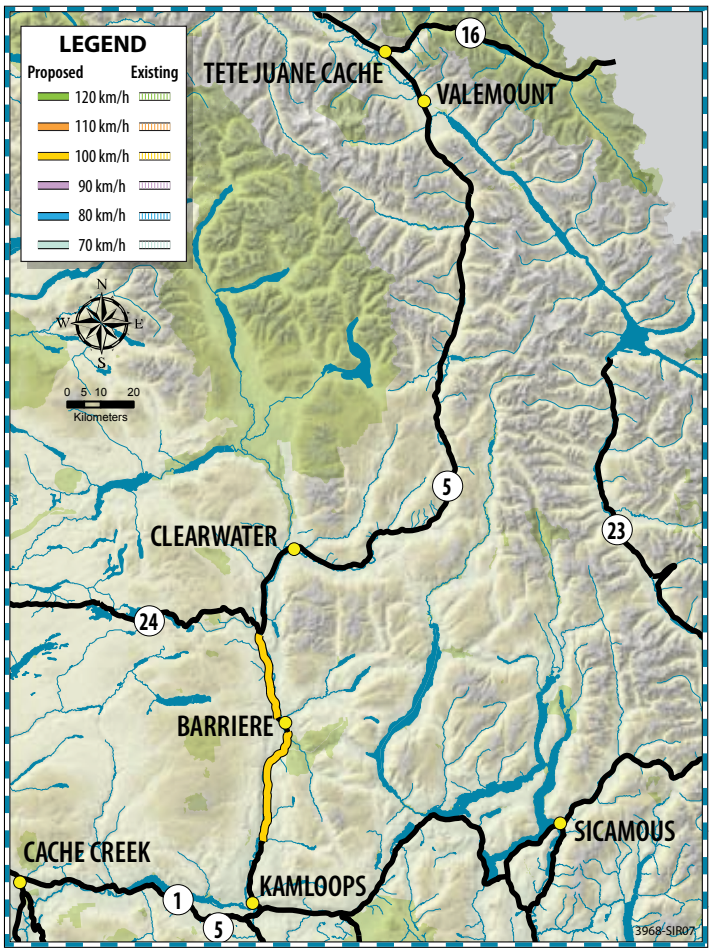
Safety: Serious summer crashes trending down by 38%

Current Speed Limit . . . . . 90 km/h

85th Percentile Speed . . . . . 102 km/h

Public Consultation Support . . . . . N/A

Recommendation: 100 km/h



Description

Highway 5 from Kamloops to Tête Jaune Cache is a major highway connection between the Interior and Northern region. The highway also provides primary connection between Northern Alberta and the Lower Mainland through the Interior. This segment of the highway carries, on average, 5000 vehicles every day with 15% being heavy trucks.

The segment between Sun Peaks and Little Fort is currently posted at 90 km/h. There is an existing 243 km long segment posted at 100 km/h north of Little Fort to Tete Jaune Cache, and a 19 km long segment of 100 km/h south of Sun Peaks to Kamloops.

The majority of the corridor is a two-lane undivided highway with few passing lanes as well as passing opportunities, while yellow center-line has rumble strips where double solid yellow lines exist. The access and intersection frequency is dispersed and consistent with other highway systems in the interior, where 100 km/h speed is posted.

Conclusion

It is recommended that the posted speed limit over a 67 km long segment between Sun Peaks and Little Fort be increased to 100 km/h for these factors:

- measured 85th percentile speed within the 90 km/h zone is 12 km/h above the posted,
- this increase will result in consistent speed limits at a length of 330 km between Kamloops and Tête Jaune Cache. The 60 km/h through Barriere, Little Fort and Clearwater will remain unchanged.

Princeton to TN Boundary (south of Aspen Grove)

Physical Characteristics

Start Point: Old Hedley Rd

End Point: Hwy 97C junction

Length . . . . . .36 km

Number of Lanes. 2

Divided . . . . . No

Operational Characteristics

Average Daily Traffic 1,200

% Trucks. . . . . n/a

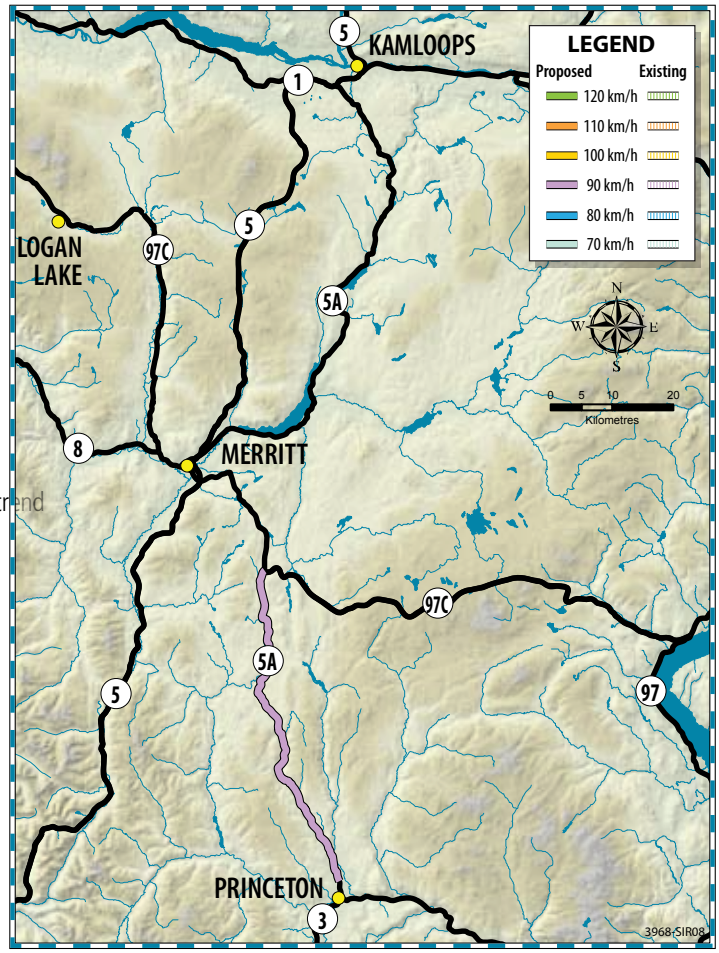
Safety: Too few serious summer crashes to determine a trend

Current Speed Limit . . . . . 80 km/h

85th Percentile Speed . . . . . 99 km/h

Public Consultation Support 72%

Recommendation: 90 km/h



Description

Highway 5A from Princeton to Merritt is a numbered route with relatively low traffic volumes, as it runs parallel to other major provincial highway networks such as Coquihalla and Hwy 97 through Okanagan.

The highway carries, on average, 1200 vehicles every day. The overall length of the segment between Princeton and Aspen Grove is 60 km. The speed limit over an 18 km segment is 90 km/h while the remaining segment is posted at 80 km/h.

The majority of the segment is a two-lane undivided highway with passing opportunities. The access and intersection frequency as well as road characters between the 80 km/h and 90 km/h zones are consistent.

Conclusion

It is recommended that the posted speed limit over 36 km segment be increased from 80 km/h to 90 km/h for these factors:

- measured 85th percentile speed within the 80 km/h zone is 19 km/h above the posted,
- this increase will result in consistent speed limits at a length of 60 km between Princeton and Aspen Grove.

New Denver to Hills

Physical Characteristics

Start Point: Golf Course Rd

End Point: Purdy Rd (Excluding 70 km/h through Hills)

Length . . . . . .15 km

Number of Lanes. 2

Divided . . . . . No

Operational Characteristics

Average Daily Traffic 1,500

% Trucks. 9%

Safety: Too few serious summer crashes to determine a trend

Current Speed Limit . . . . . 80 km/h

85th Percentile Speed . . . . . 99 km/h

Public Consultation Support 61%

Recommendation: 90 km/h

Summit Lake to Nakusp

Physical Characteristics

Start Point: Purdy Rd

End Point: Upper Brouse Rd

Length . . . . . .22 km

Number of Lanes. 2

Divided . . . . . No

Operational Characteristics

Average Daily Traffic 1,500

% Trucks. 9%

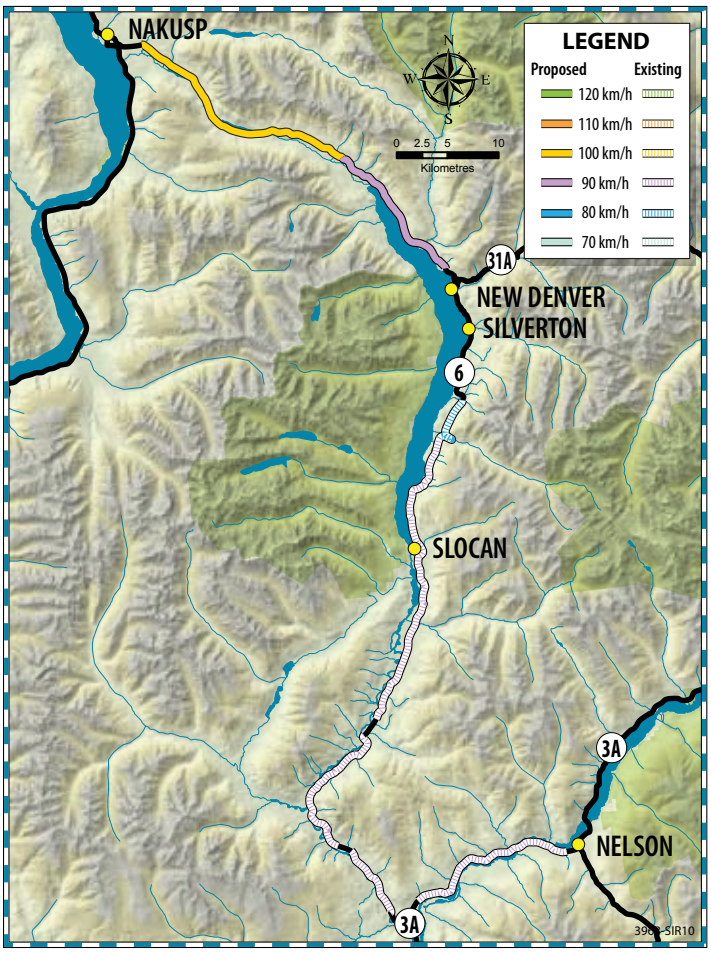
Safety: Too few serious summer crashes to determine a trend

Current Speed Limit . . . . . 90 km/h

85th Percentile Speed . . . . . 110 km/h

Public Consultation Support 61%

Recommendation: 100 km/h



Description

Highway 6 from Nelson to Nakusp begins at the Junction with Highway 3A in Playmour and travels north up the Slocan Valley to Nakusp. It is a two-lane undivided highway with passing opportunities. There are multiple communities along Highway 6 which would not be affected by the speed limit change.

Recent resurfacing projects have strived to achieve reasonable shoulder widths through some of the more difficult geometry. These efforts have provided a more consistent cross section along the highway.

There is a marked change in geometry near Hills as Highway 6 leaves the Arrow Lake Reservoir and climbs towards Summit Lake. This geometry includes longer tangents and more gentle horizontal curves.

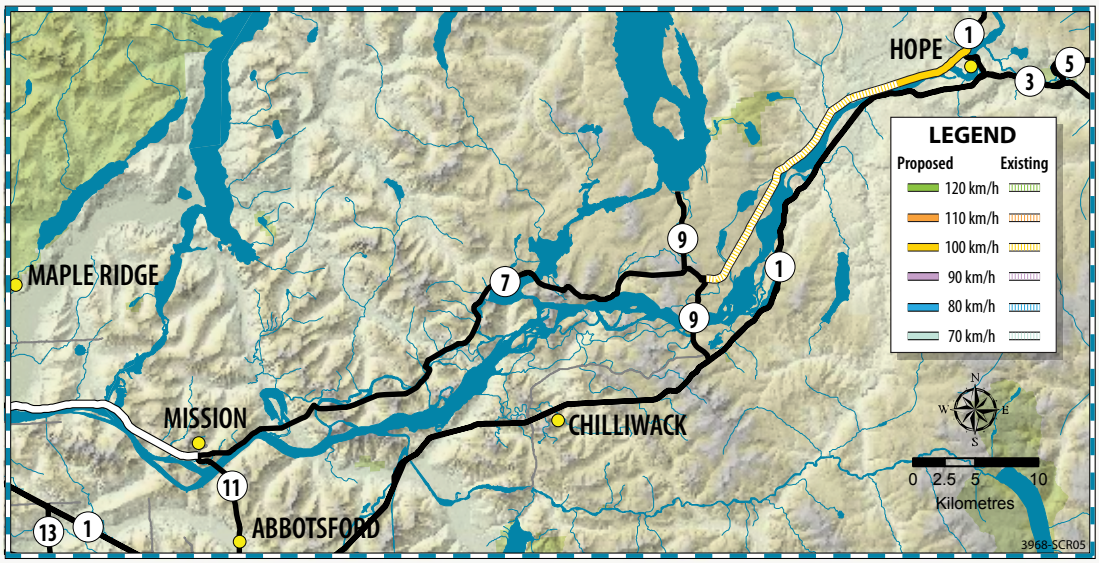
Conclusion

It is recommended that the posted speed limit over the 15km segment between New Denver and Hills be increased from 80km/h to 90km/h for these factors:

- measured 85th percentile speed is 19 km/h above the posted,
- this would provide a consistent speed limit of 90km/h from Nelson to Hills, at a length of 95km. Note that this would exclude intervening speed zones through communities.

It is recommended that the posted speed limit over 22km segment between Hills and Nakusp be increased from 90 km/h to 100 km/h for these factors:

- Measured 85th percentile speed is 20 km/h above the posted
- This would provide a consistent speed limit of 100 km/h from Hills to Revelstoke at a length of 134 km.



Agassiz to Hope

Physical Characteristics

Start Point: Pull Out west of Haigh Scale

End Point: Junction with Hwy 1

Length . . . . . .5 km

Number of Lanes. 2

Divided . . . . . No

Operational Characteristics

Average Daily Traffic 4,900

% Trucks. 9%

Safety: Too few summer crashes to determine a trend

Current Speed Limit . . . . . 90/100 km/h

85th Percentile Speed . . . . . 107 km/h

Public Consultation Support 71%

Recommendation: Increase (90 km/h sections to 100 km/h)

Description

Highway 7 is an un-divided highway that connects North Fraser River communities and parallels Highway 1, the Trans-Canada Highway.

The majority of the highway is one lane in each direction with passing and climbing lanes.

Access onto Highway 7 occurs via at grade intersections and private accesses.

The existing speed limit on Highway 7, between Agassiz and Hope, ranges from 90 km/h to 100 km/h over 27 km stretch. Observed 85th percentile speeds over this highway are about 107 km/h.

Conclusion

It is recommended that the posted speed limit be increased to 100 km/h for these factors:

- measured 85th percentile speed is 17 km/h above the posted speed of 90 km/h,
- improve speed limit consistency.

Parksville to Campbell River

Physical Characteristics

Start Point: 1 km north of exit to Parksville/Weigh Scale

End Point: South of Willis Rd

Length . . . . . 114 km

Number of Lanes. 4

Divided . . . . . Yes

Operational Characteristics

Average Daily Traffic 9,400

% Trucks. 8%

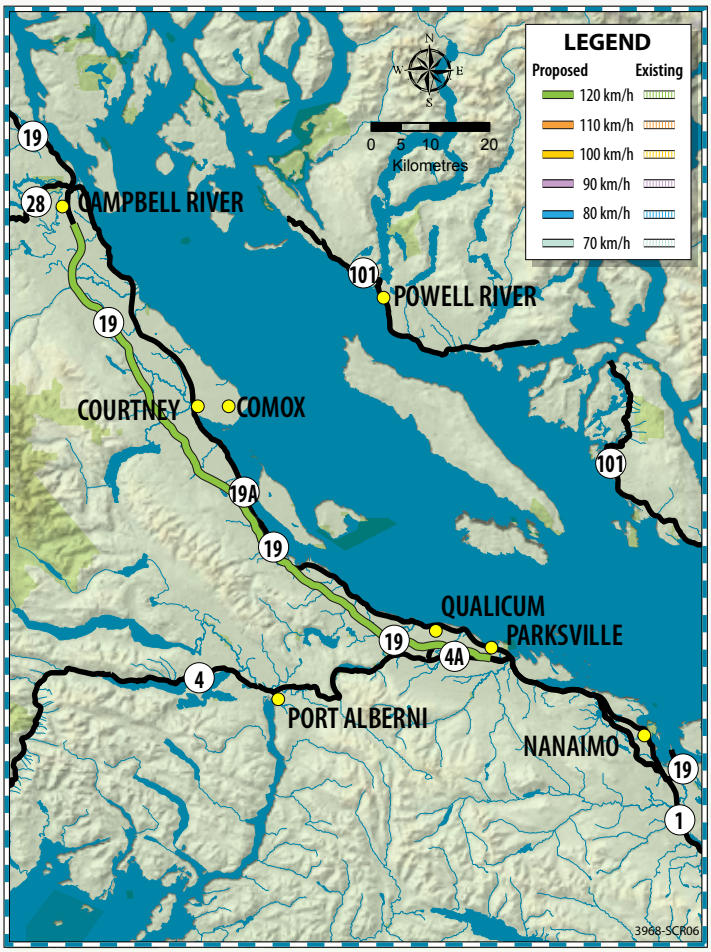
Safety: Serious summer crashes trending down by 34%

Current Speed Limit . . . . . 90/110 km/h

85th Percentile Speed . . . . . 121 km/h

Public Consultation Support 57%

Recommendation: Increase 110 km/h to 120 km/h



Description

Highway 19 (Nanaimo to Campbell River) is a divided highway that connects rural communities from Nanaimo to Campbell River.

The majority of the highway is two lanes in each direction.

Highway 19 is a controlled access highway with interchanges but also with at grade signalized intersections. Each interchange has acceleration and deceleration lanes to accommodate high speed.

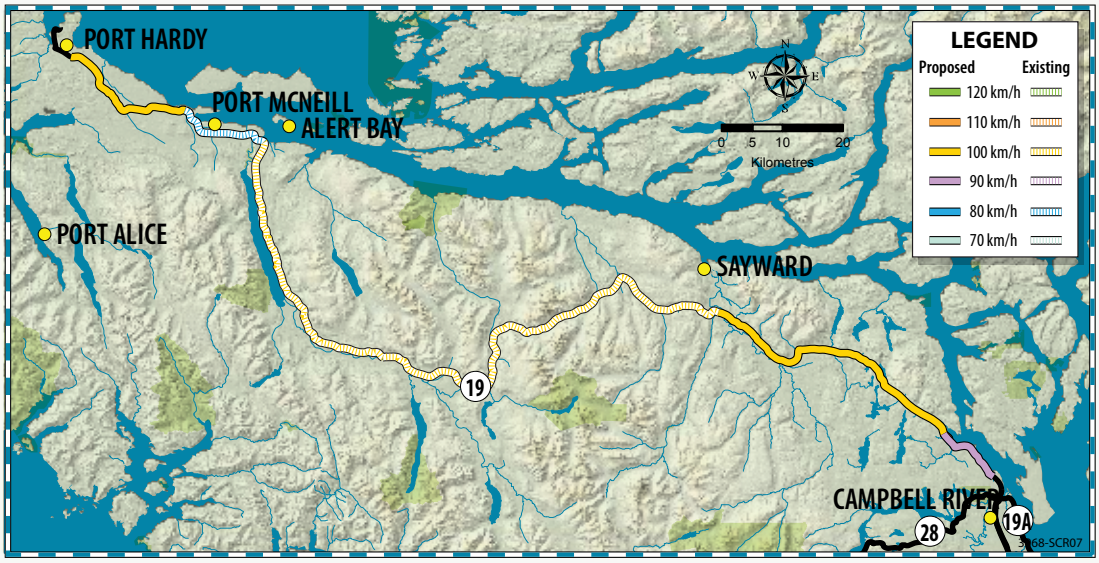
The terrain is rolling. The average daily traffic volume is approximately 9,400 vehicles per day with about 8% being truck traffic. Much of the corridor has wildlife exclusion fencing.

Conclusion

It is recommended that the posted speed limit be increased to 120 km/h for these factors:

- measured 85th percentile speed is 11 km/h above the posted speed of 110 km/h,
- summer serious crashes have been trending downwards with a 34 % reduction since 2003.

Speed limits will not change within the reduced 90 km/h zones through signalized intersections.



Shared Physical Characteristics

Number of Lanes 2 Divided No

Shared Operational Characteristics

Average Daily Traffic 1,200

% Trucks 7%

Safety: Too few serious summer crashes to determine a trend

Campbell River to Bloedel

Physical Characteristics

Start Point: North of Duncan Bay Rd

End Point: North of Mohun Creek Bridge

Length . . . . . .10 km

Operational Characteristics

Current Speed Limit . . . . . 80 km/h

85th Percentile Speed . . . . . 95 km/h

Public Consultation Support 56%

Recommendation: 90 km/h

Bloedel to Sayward

Physical Characteristics

Start Point: North of Mohun Creek Bridge

End Point: Gentry Rd

Length . . . . . .44 km

Operational Characteristics

Current Speed Limit . . . . . 90 km/h

85th Percentile Speed . . . . . 106 km/h

Public Consultation Support 56%

Recommendation: 100 km/h

Port McNeill to Port Hardy

Physical Characteristics

Start Point: Cluxewe Bridge

End Point: Douglas St

Length . . . . . .25 km

Operational Characteristics

Current Speed Limit . . . . . 80/90 km/h

85th Percentile Speed . . . . . 96 km/h

Public Consultation Support 56%

Recommendation: 100 km/h

Description

Highway 19 (Campbell River to Port Hardy) is an undivided highway that connects rural communities north from Nanaimo to Port Hardy. The majority of the highway is one lane in each direction, and has infrequent at grade intersections and accesses. The terrain is rolling.

Conclusion

Speed limit increases are recommended:

- Campbell River to Bloedel 80 km/h to 90 km/h,
- Bloedel to Sayward 90 km/h to 100 km/h,
- Port McNeill to Port Hardy 80 km/h and 90 km/h to 100 km/h.

85th percentile speed are generally 15 km/h above the posted speed limit.

The existing 100 km/h zone between Sayward and Port McNeill will remain unchanged.

Speed limits will not change within communities.

Black Mountain to McCulloch Rd (District Boundary)

Physical Characteristics

Start Point: South of Gallagher Rd

End Point: South of Big White

Length . . . . . .32 km

Number of Lanes. 2

Divided . . . . . No

Operational Characteristics

Average Daily Traffic 2,000

% Trucks. . . . . n/a

Safety: Overall Rock Creek to Kelowna corridor serious summer crashes trending down by 57%

Current Speed Limit . . . . . 90 km/h

85th Percentile Speed . . . . . 101 km/h

Public Consultation Support 65%

Recommendation: 100 km/h

Rock Creek to Westbridge

Physical Characteristics

Start Point: 1 km North of Junction with Hwy 3

End Point: 1 km south of Christian Valley Rd

Length . . . . . .12 km

Number of Lanes. 2

Divided . . . . . No

Operational Characteristics

Average Daily Traffic 2,000

% Trucks. . . . . n/a

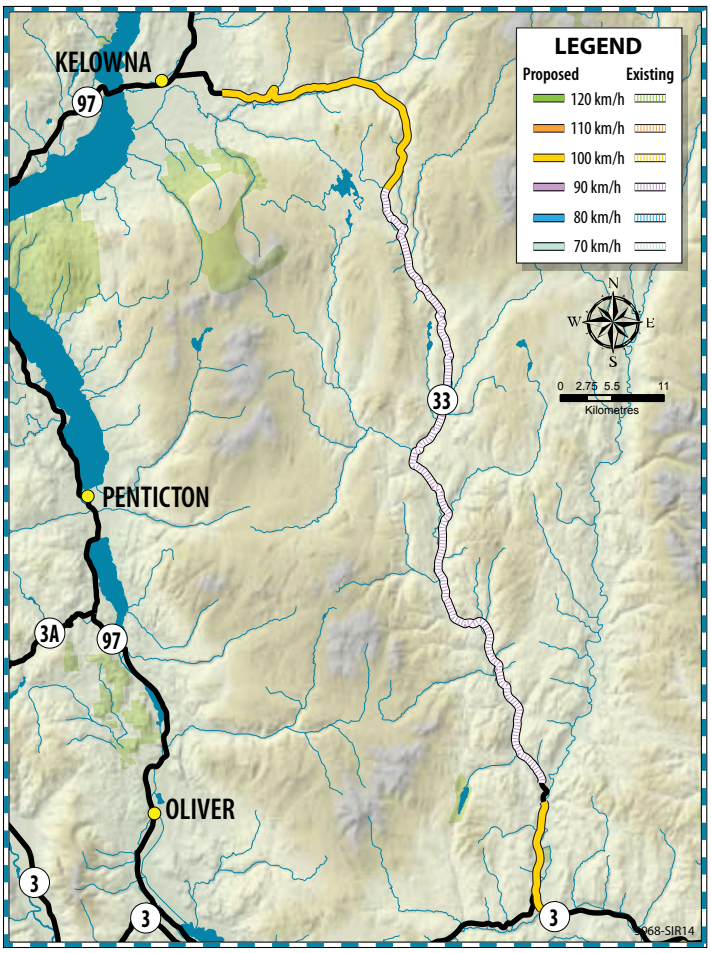
Safety: Overall Rock Creek to Kelowna corridor serious summer crashes trending down by 57%

Current Speed Limit . . . . . 90 km/h

85th Percentile Speed . . . . . 110 km/h

Public Consultation Support 65%

Recommendation: 100 km/h



Description

Highway 33 from Kelowna to Rock Creek is a 123 km segment which travels north/south, terminating in at the junction of Highway 97 in Kelowna and Highway 3 in Rock Creek. Highway 33 is used as the primary route to Big White Ski Resort, approximately 30 km south of Kelowna. It travels through the Kettle Valley which is the historic railway route established in the early 20th Century.

The highway carries on average, 2000 vehicles every day. The majority of the segment is a two-lane undivided highway with few passing lanes as well as passing opportunities. The center line has rumble strips where double solid yellow lines exist.

Conclusion

It is recommended that the posted speed limit over 44 km of the 123 km segment between Kelowna and Rock Creek be increased to 100km/h for these factors:

- measured 85th percentile speed between Black Mountain and Big White is 11 km/h above the posted,
- measured 85th percentile speed between Westbridge and Rock Creek is 20 km/h above the posted.
  A 79 km segment between Big White and Westbridge remains unchanged at 90 km/h due to the frequency of horizontal curves along this section.

Cache Creek to 100 Mile House

Physical Characteristics

Start Point: 1 km north of Willow Dr (70 Mile)

End Point: BCR Overpass (100 Mile)

Length . . . . . .37 km

Number of Lanes. 4

Divided . . . . . No

Operational Characteristics

Average Daily Traffic 4,000

% Trucks. 20%

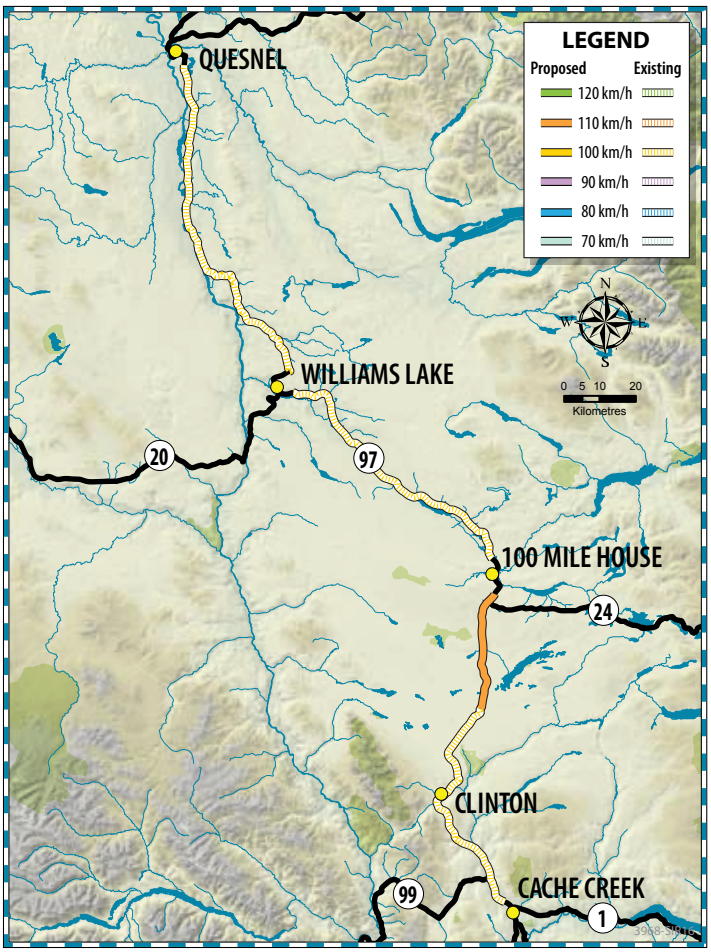
Safety: Serious summer crashes trending down by 53%

Current Speed Limit . . . . . 100 km/h

85th Percentile Speed . . . . . 114 km/h

Public Consultation Support 63%

Recommendation: 110 km/h



Description

Highway 97 also known as Cariboo Connector is a major highway connection from South Coast and Interior to Cariboo. It provides primary connection from Alaska and Northern Territories to the rest of the province. The segment between Cache Creek and Quesnel carries, on average, 4000 vehicles every day with 20% being heavy trucks. The majority of the highway between Cache Creek and Quesnel is posted at 100 km/h.

The province is 4-laning the Cariboo Connector between Cache Creek and Prince George in that there is a ~37 km long segment between 70 Mile and 100 Mile where the highway has been 4-laned with 2.6 m wide painted median, 2.5 m wide paved shoulders, 4:1 traversable slope with 8.0 m minimum clear zone. The painted median has rumble strips. There are very limited accesses and intersections along this section. All intersection points have provisions for future left turn lanes with up to 4.0 m wide widening within the painted median.

The over-all highway design standard used for the Cariboo Connector is capable of accommodating an increase in speed limit of 10 km/h.

Conclusion

It is recommended that the posted speed limit over 37 km between 70 Mile and 100 Mile be increased to 110 km/h for these factors:

- measured 85th percentile speed within the newly 4-laned section is 14 km/h above the posted,
- this increase will meet drivers' expectations because of improved road geometrics along the new 4-lane section relative to the existing 2-lane undivided segments posted at 100 km/h.
- serious summer crashes are trending downward by 53%.

Gatzke to College Way

Physical Characteristics

Start Point: Gatzke Rd (North of Oyama)

End Point: College Way

Length . . . . . .16 km

Number of Lanes. 4

Divided . . . . . No

Operational Characteristics

Average Daily Traffic 20,000

% Trucks. 12%

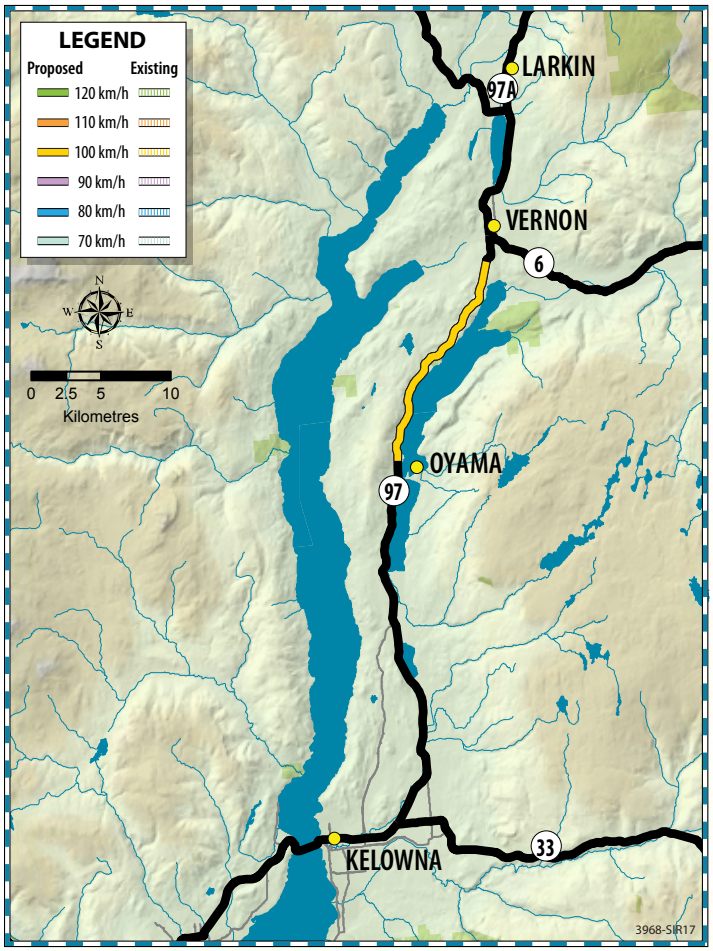
Safety: Serious summer crashes trending down by 45%

Current Speed Limit . . . . . 90 km/h

85th Percentile Speed . . . . . 109 km/h

Public Consultation Support 84%

Recommendation: 100 km/h



Description

Highway 97 from Kelowna to Vernon provides a primary connection between two major population centres. The highway also provides a connection between US and rest of the province through Okanagan.

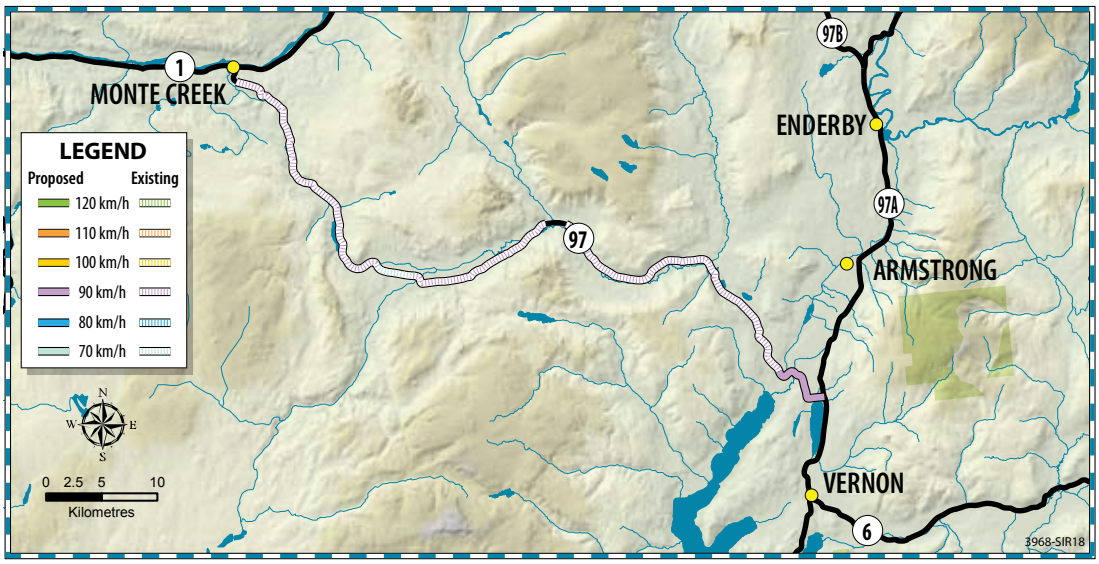
This segment carries, on average, 20,000 vehicles every day with 12% being heavy trucks. There is an existing 9 km segment recently constructed as a by-pass through Lake Country which is posted at 100 km/h. North of the new 4-lane section there is a 16 km segment also 4-laned in late 80's, with painted median and rumble strips and posted at 90 km/h.

There are very limited accesses on this segment and public road intersections have auxiliary right/left turn lanes throughout.

Conclusion

It is recommended that the posted speed limit over 16 km segment between Gatzke Road interchange and College Way intersection be increased to 100 km/h for these factors:

- measured 85th percentile speed within the 90 km/h zone is 19 km/h above the posted,
- this increase will result in consistent speed limits at a length of 25 km between Lake Country and Vernon.



Swan Lake to Monte Creek

Physical Characteristics

Start Point: Hwy 97A junction (Swan Lake)

End Point: Westside Rd

Length . . . . . .6 km

Number of Lanes. 2

Divided . . . . . No

Operational Characteristics

Average Daily Traffic 4,000

% Trucks. 15%

Safety: Too few serious summer crashes to determine a trend

Current Speed Limit . . . . . .80 km/h

85th Percentile Speed . . . . . .91 km/h

Public Consultation Support 66%

Recommendation: 90 km/h
(Swan Lake to Westside Rd)

Description

Highway 97 from Vernon to Monte Creek provides a primary connection between south Okanagan and the Interior. This segment carries, on average, 4,000 vehicles every day with 15% being heavy truck volumes. The overall segment length between Swan Lake and Monte Creek junctions is 80 km in that majority of the corridor is posted at 90 km/h.

The majority of the segment is a two-lane undivided highway with few passing lanes as well as passing opportunities. The yellow center-line has rumble strips where double solid lines exist.

The segment proposed for speed increase is generally flat while overall corridor has moderate curvilinear alignment. The access and intersection frequency is dispersed and consistent between the 90 km/h and 80 km/h zones.

Conclusion

It is recommended that the posted speed limit over 6 km segment between Swan Lake junction and Westside Road intersection be increased to 90 km/h for these factors:

- measured 85th percentile speed within the 80 km/h zone is 11 km/h above the posted,
- this increase will result in consistent speed limits at a length of 80 km between Swan Lake and Monte Creek junctions.

Armstrong to Enderby

Physical Characteristics

Start Point: North of Smith Dr

End Point: Hwy 97B junction
(excluding 50 km/h in Enderby)

Length . . . . . .18 km

Number of Lanes. 2

Divided . . . . . No

Operational Characteristics

Average Daily Traffic 11,000

% Trucks. 5%

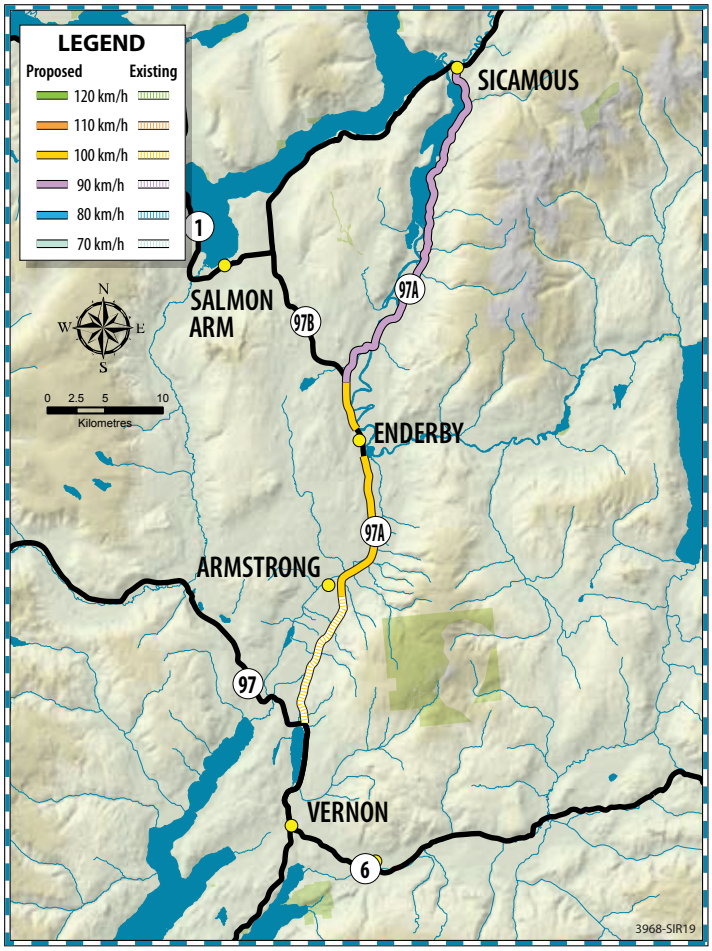
Safety: Too few serious summer crashes to determine a trend

Current Speed Limit . . . . . 90 km/h

85th Percentile Speed . . . . . 101 km/h

Public Consultation Support 56%

Recommendation: 100 km/h



Description

Highway 97A from Vernon to Sicamous provides a primary connection between North Okanagan and rest of the Interior. This segment carries, on average, 11000 vehicles every day with 5% being heavy trucks.

The segment between Swan Lake and Armstrong is 4-lane undivided with painted median and posted at 100 km/h. The corridor north of Armstrong is a 2-lane undivided highway with relatively flat terrain with few passing lanes as well as passing opportunities.

The access and intersection frequency is dispersed and consistent with other highway systems in the interior where 100 km/h speed is posted.

Conclusion

It is recommended that the posted speed limit over 18 km segment between Armstrong and Hwy 97B junction be increased to 100 km/h for these factors:

- measured 85th percentile speed within the 90 km/h zone is 11 km/h above the posted,
- this increase will result in consistent speed limits at a length of 30 km between Swan Lake and Hwy 97B junction.

Gridiron to Sicamous

Physical Characteristics

Start Point: Hwy 97B junction

End Point: Sicamous Creek Bridge (excluding 50 km/h in Grindrod)

Length . . . . . .33 km

Number of Lanes. 2

Divided . . . . . No

Operational Characteristics

Average Daily Traffic 4,000

% Trucks. . . . . n/a

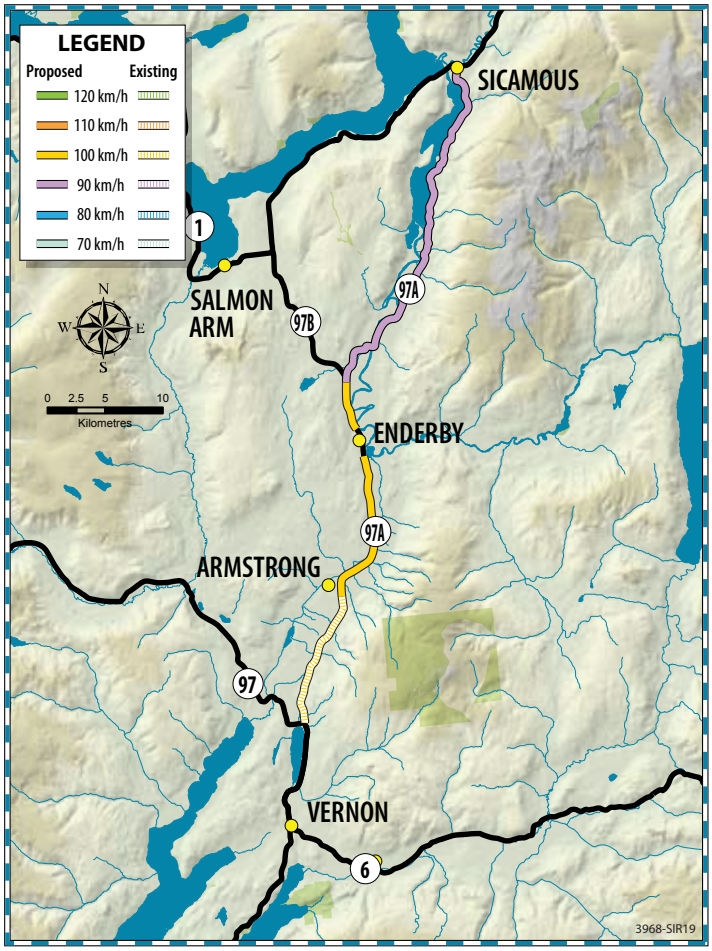
Safety: Too few serious summer crashes to determine a trend

Current Speed Limit . . . . . .80 km/h

85th Percentile Speed . . . . . .95 km/h

Public Consultation Support 56%

Recommendation: 90 km/h



Description Grinrod to Sicamous

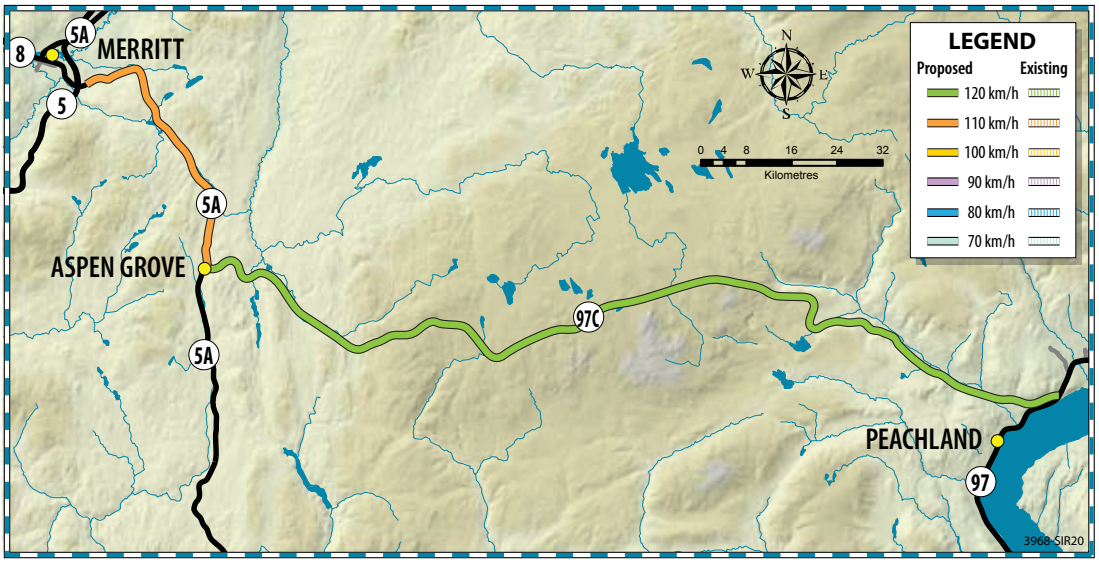
Hwy 97A between Grindrod and Sicamous provide a parallel road connection between north Okanagan and rest of the interior. The segment carries, on average, 4,000 vehicles every day.

The segment is mostly two-lane undivided with moderate curvilinear alignment and currently posted at 80 km/h. The access and intersection frequency is dispersed and consistent with other highway systems in the interior where 90 km/h speed is posted

Conclusion

It is recommended that the posted speed limit between Grindrod and Sicamous be increased to 90 km/h for these factors:

- measured 85th percentile speed within the 80 km/h zone is 15 km/h above the posted.



Merritt to Aspen Grove

Physical Characteristics

Start Point: Junction with Hwy 5 Coquihalla (Coldwater Interchange)

End Point: Junction with Hwy 5A (Aspen Grove Interchange)

Length . . . . . .22 km

Number of Lanes 4 Divided No

Operational Characteristics

Average Daily Traffic 5,500

% Trucks. 15%

Safety: Overall Okanagan Corridor serious summer crashes trending down by 71%

Current Speed Limit . . . . . 100 km/h

85th Percentile Speed . . . . . 123 km/h

Public Consultation Support 81%

Recommendation: 110 km/h

Aspen Grove to Peachland

Physical Characteristics

Start Point: Junction with Hwy 5A (Aspen Grove)

End Point: Junction with Hwy 97 (Drought Hill Interchange)

Length . . . . . .78 km

Number of Lanes 4 Divided Yes

Operational Characteristics

Average Daily Traffic 6,000

% Trucks. 15%

Current Speed Limit . . . . . 110 km/h

85th Percentile Speed . . . . . 126 km/h

Recommendation: 120 km/h

Description

The third phase of the Coquihalla , the Okanagan Connector, running from Merritt to Peachland, was completed in 1990.

The Merritt to Aspen Grove segment has current posted speed is 100 km/h. The highway is two lanes in each direction divided by a wide asphalt median with rumble trips. The highway has few accesses. The nature of the highway changes at Aspen Grove. From Aspen Grove through to Peachland, the highway is posted at 110 km/h and is divided by either concrete barrier or a depressed median. It is a controlled access highway with interchanges. Each interchange has acceleration and deceleration lanes to accommodate higher speed limits; there are additional truck climbing on the longer grades.

The Aspen Grove to Peachland segment has wildlife exclusions systems to prevent animals from venturing onto the highway.

Conclusion

It is recommended that the posted speed limit be increased to 110 km/h from Merritt to Aspen Grove and 120 km/h from Aspen Grove to Peachland for these factors:

- measured 85th percentile speed is 13-16 km/h above the posted speed,
- summer serious crashes have been trending downwards with a 71% reduction since 2003.

Horseshoe Bay to Squamish

Physical Characteristics

First Start Point: Eagle Ridge Interchange

End Point: South of Stawamus River Bridge

Length . . . . . .35 km

Number of Lanes. 4

Divided . . . . . Yes

Operational Characteristics

Average Daily Traffic 10,800

% Trucks. 2%

Safety: Serious summer crashes trending down by 39%

Current Speed Limit . . . . . 80 km/h

85th Percentile Speed . . . . . 102 km/h

Public Consultation Support 83%

Recommendation: 90 km/h

Squamish to Whistler

Physical Characteristics

Start Point: North of Depot Rd

End Point: Alpha Lake Rd (Function Junction)

Length . . . . . .45 km

Number of Lanes. 3/4

Divided . . . . . No

Operational Characteristics

Average Daily Traffic 9,200

% Trucks. 2%

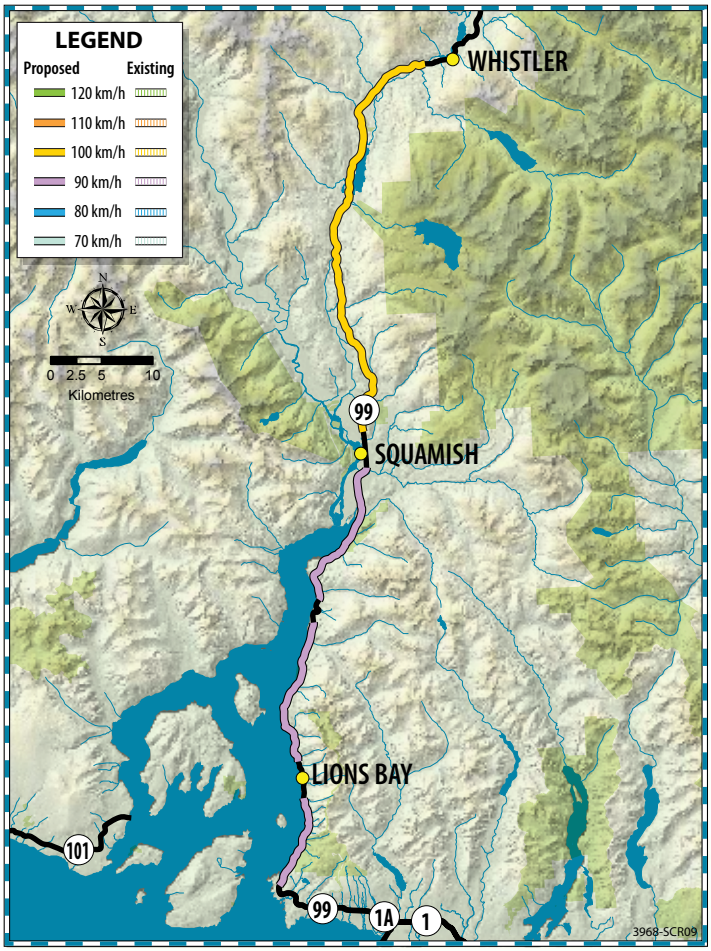
Safety: Serious summer crashes trending down by 39%

Current Speed Limit . . . . . 80/90 km/h

85th Percentile Speed . . . . . 105 km/h

Public Consultation Support 84%

Recommendation: 100 km/h



Description

The Sea-to-Sky highway connects Metro Vancouver through the Coast Mountains to Whistler.

The majority of the highway is two lanes divided in each direction to Squamish. North of Squamish the nature of the highway changes to one lane in each direction with passing and climbing lanes. Access to the highway is through several interchanges in the southern section of the highway, but mostly at grade intersections to the north. Traffic volumes fluctuate with seasonal activities and special events.

Conclusion

It is recommended that the speed limits be increased in these areas: Horseshoe Bay to Squamish to 90 km/h, and Squamish to Whistler to 100 km/h.

The 85th percentile speeds are 15-22 km/h over the posted speed limits. Serious summer crashes are trending down by 39%.

Note: Speed limits will not change within the communities of Lions Bay, Britannia Beach, Squamish and Whistler.

Whistler to Pemberton

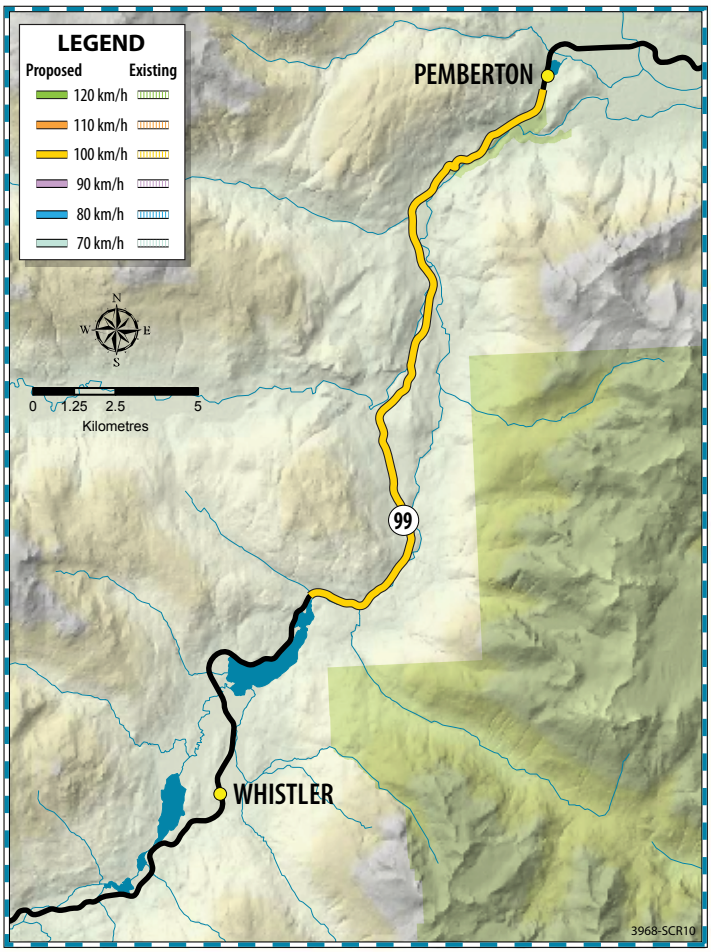
Physical Characteristics

Start Point: South of Whistler Heliport Rd
End Point: Pemberton Boundary

Length . . . . . .21 km
Number of Lanes. 2/3
Divided . . . . . No

Operational Characteristics

Average Daily Traffic 3,700
% Trucks. 2%
Safety: Too few serious summer crashes to determine a trend
Current Speed Limit . . . . . 80 km/h
85th Percentile Speed . . . . . 102 km/h
Public Consultation Support 68%
Recommendation: 90 km/h
Lillooett to Cache Creek (on separate map)



Description

Highway 99 (Whistler to Mt. Currie) is an undivided highway through mountainous terrain that connects south coast communities to the interior and North. The majority of the highway is one lane in each direction with passing and climbing lanes.

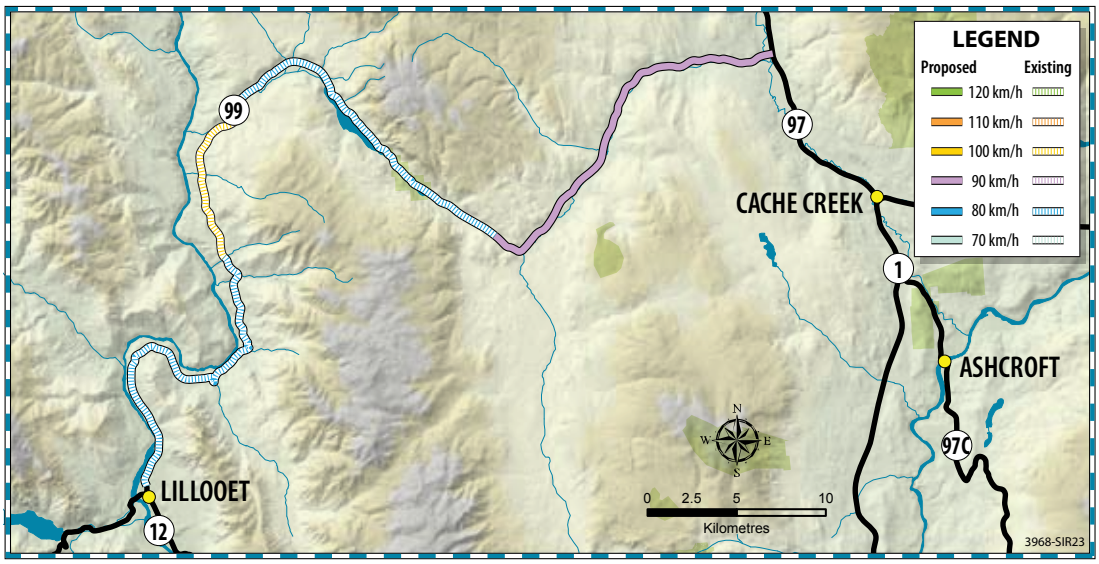
Volumes of general traffic and trucks are low.

Conclusion

It is recommended that the speed limit be increased from 80 km/h to 90 km/h.

The 85th percentile speed is 12 km/h over the posted speed limit.

Speed limits will not change within the communities of Whistler and Mt. Currie.



Lillooet to Cache Creek

Physical Characteristics

Start Point: 2.4 km north of Marble Canyon Provincial Park

End Point: Hwy 97 junction

Length . . . . . .22 km

Number of Lanes. 2

Divided . . . . . No

Operational Characteristics

Average Daily Traffic 1500

% Trucks. 13

Safety: Too few serious summer crashes to determine a trend

Current Speed Limit . . . . . 90 km/h

85th Percentile Speed . . . . . 102 km/h

Public Consultation Support 68%

Recommendation: 100 km/h

Description

Highway 99 provides a primary connection to Lillooet with Cariboo to the east, Lytton to the south and Whistler to the west. The segment between Lillooet and Cache Creek carries, on average, 1500 vehicles every day with 13% being heavy trucks. The segment traverses through Marble Canyon with relatively moderate volumes of RVs and motor homes through summer tourist season.

The majority of the segment is a two-lane undivided highway with multiple passing opportunities. The corridor has very few accesses and intersections between Hwy 97 and Lillooet. There exists a 12 km long segment posted at 100 km/h on the western section of Hwy 99 near Lillooet. All warning signs on this segment were replaced with current standards in 2013.

Conclusion

It is recommended that the posted speed limit over a 22 km segment between Hwy 97 and Marble Canyon Provincial Park be increased to 100 km/h for these factors:

- measured 85th percentile speed within the 90 km/h zone is 12 km/h above the posted,
- this increase will result in consistent speed limits between Gibbs Creek and Hwy 97 at a length of 35 km. The 80 km/h through Pavilion will remain unchanged.

APPENDIX B: ADDITIONAL HIGHWAYS FOR FURTHER ASSESSMENT

HIGHWAY DESCRIPTION	Segment Length (km)	Number of Lanes	Divided	Speed limit
Hwy 1, Surrey to Abbotsford				
160th Street to Whatcom Road	45	4	Yes	100
Hwy 6, Nelway to Nelson				
USA Border, Nelway to Burnt Flat (Hwy 3/6 Junction) (Excluding 50 km/h zone in Nelway)	10	2	No	90
First Street (Salmo) to Cottonwood Rd (Nelson)	41	2	No	90
Hwy 6, Lumby to Fauquier				
Quesnel Road (Lumby) to 7 km West of Deep Creek Bridge	77	2	No	80
Hwy 12, Lytton to Lillooet				
Green Meadows Road (Lytton) to Junction with Hwy 99	60	2	No	80
Hwy 17, Patricia Bay Highway				
150 m North of Saanich Firehall to Lands End Road (Swartz Bay)	26	4	Yes	80,90
Hwy 17, South Fraser Perimeter Road[1]				
56th Street (Tsawwassen) to Junction with Highway 1 and 15 (Surrey)	37	4	Yes	80
Hwy 24, Little Fort to Hwy 97 Junction				
Lemieux Creek Bridge to Junction Hwy 97 (Excluding 50 km/h through Lone Butte)	95	2	No	80, 90
Hwy 28, Campbell River to Gold River				
130 m West of the Quinsam River Bridge at Campbell River to 510 m East of Muchalat Drive in Gold River	85	2	No	80
Hwy 43, Sparwood to Elkford				
North of Lower Elk Valley Road to Village of Elkford Boundary	33	2	No	90
Hwy 97C, Logan Lake to Ashcroft				
West of Hwy 97D Junction to West of Mesa Vista Drive	54	2	No	80, 90
Hwy 97D, Hwy 5 Junction to Logan Lake				
Junction with Hwy 5 (Walloper Interchange) to East of Galena Avenue	23	2	No	90

1 For SFPR, Existing 50 km/h zone recommended for increase to 70 km/h