

Pages 1 through 236 redacted for the following reasons:

s14, s17

From: [Schmidt, Karen TRAN:EX](#)
To: [Hazlewood, Anne TRAN:EX](#); [Bains, Jessie TRAN:EX](#); [Malik, Naasir TRAN:EX](#)
Cc: [Chhun, Thomas TRAN:EX](#)
Subject: Hwy 1 at Slanzi Road (Canyon Alpine) in Boston Bar
Date: Monday, December 19, 2011 1:34:26 PM
Attachments: [20111219133135.pdf](#)

Good afternoon,

For discussion with Thomas....

Karen Schmidt

District Clerk

Ministry of Transportation and Infrastructure

Chilliwack Area Office

45890 Victoria Avenue

Chilliwack BC V2P 2T1

Phone: (604)795-8211

Fax: (604)795-8214

From: [Hazlewood, Anne](#) TRAN:EX
To: [Malik, Naasir](#) TRAN:EX; [Bains, Jessie](#) TRAN:EX
Cc: [Kelly, Mike](#) TRAN:EX
Subject: FW: Highway 1 @ Slanzi Road
Date: Wednesday, June 19, 2013 10:46:39 AM
Attachments: [20130619101542.pdf](#)
[Re RE Fraser Canyon Danger - Passing LaneTurning Lane.msg](#)
[RE Hwy 1 at Slanzi Road \(Canyon Alpine\) in Boston Bar.msg](#)
[Hwy 1 at Slanzi Road \(Canyon Alpine\) in Boston Bar.msg](#)

Sorry Guys s.22

Anyway, I have received another request for a review of the Hwy 1/Slanzi Rd intersection. This time it is a request for signs.

Could we please have the engineering group take a look at this location and come up with a proposal/possible solution?

Thanks,

Anne Hazlewood
Area Manager
Ministry of Transportation and Infrastructure
South Coast Region
Hope Sub-Office
Office Ph. 604-869-7328
Cell Ph. s.17
e-mail Anne.Hazlewood@gov.bc.ca

From: [Cross, Graeme D TRAN:EX](#)
To: [Yang, Jin Dong TRAN:EX](#)
Cc: [Ludwar, Kenedee TRAN:EX](#)
Subject: FW: Hwy 1 at Slanzi, Hwy 1 NB Left Turn Issue
Date: Monday, November 4, 2013 9:55:09 AM

Jin.

Please review the request below and provide a recommendation for left turn safety near Slanzi Road. Thank you.

Graeme Cross, P.Eng.

Senior Traffic Operations Engineer for the South Coast Region

Ministry of Transportation and Infrastructure

Cell [s.17](#) | Office: 604-527-2263 | Graeme.Cross@gov.bc.ca

From: Ludwar, Kenedee TRAN:EX
Sent: Monday, November 4, 2013 8:45 AM
To: Crichton, William H TRAN:EX; Cross, Graeme D TRAN:EX
Cc: Hazlewood, Anne TRAN:EX; Malik, Naasir TRAN:EX
Subject: RE: Hwy 1 at Slanzi, Hwy 1 NB Left Turn Issue

Bill – My apologies. I had attempted to forward this on, but saved it as a draft and never sent it.

Graeme- Can you have someone look into this request ASAP.

Kenedee

Kenedee Ludwar, P.Eng.

Manager of Traffic Engineering and Highway Design

Phone (604) 527-2255

Cell [s.17](#)

Suite 310 – 1500 Woolridge Street, Coquitlam, BC V3K 0B8

From: Crichton, William H TRAN:EX
Sent: Monday, November 4, 2013 8:17 AM
To: Ludwar, Kenedee TRAN:EX
Cc: Hazlewood, Anne TRAN:EX; Malik, Naasir TRAN:EX
Subject: Hwy 1 at Slanzi, Hwy 1 NB Left Turn Issue

Kenedee,

Can you provide a follow up to Jessie's email regarding this status of this review? Thanks.

Bill Crichton

District Technician

310 - 1500 Woolridge St.

Coquitlam, BC

V3K 0B8

Tel: 604-527-2239
Cel: s.17
Fax: 604-527-2222

From: Bains, Jessie TRAN:EX
Sent: Wednesday, August 28, 2013 11:20 AM
To: 'Weightman, Michael'; Ludwar, Kenedee TRAN:EX
Cc: s.22 ; Hazlewood, Anne TRAN:EX; Malik, Naasir TRAN:EX; Crichton, William H TRAN:EX
Subject: RE: Hwy 1 at Slanzi road - North of Boston Bar

Mike,

Feedback from the public is always welcome, most especially when the feedback is from enforcement officials who have firsthand experience.

With regard to the location and upon review and site visit, I can appreciate Cst. Jaret Duncan's observations and experiences. This is a four lane section of highway which extends over approximately 3km and the access locations in question are located midpoint and towards the North End of the Crest Curve.

The TCH in this section may be subject to being overdriven which creates challenges as noted by the Constable Duncan as the locations of the accesses to Slanzi Road on the West side of the TCH and access to Canyon Alpine Motel /RV Park at Pfenniger Road on the Eastside of the TCH and are offset "T" intersections approximately 70m apart. Both of these accesses are essentially located towards the North End of a very long crest vertical curve.

NB approach to Pfenniger Road has a decel lane for the NB right turn to Pfenniger Road. Egress from Pfenniger Road to head NB or SB on the TCH appear to achieve the appropriate sight distances for the posted speed. With the exception of a SB decel lane to access Slanzi Road, the sight line to access the TCH NB and SB also appear to achieve the appropriate sight distance for the posted speed.

The issue appears to be left turn movement to access Slanzi Road from the NB fast lane of the TCH. Although as noted above there is crest curve,, the sight distance is good for motorists to move right in the event a vehicle is turning left from TCH onto Slanzi Road, the same can be said for SB TCH traffic making a left onto Pfenniger Road.

The proposal below for a "WA-13R" which identifies a "Concealed Road to the right" may be of benefit for the SB traffic approaching Slanzi Road, it would not address the issue at hand. It may be more appropriate, if a sign is being requested for considered on this four lane section for a "Consealed Road" sign, that a special sign to be fabricated to identify both accesses for both NB and SB approaches to Pfenniger Road and Slanzi Road.

By way of this email, I have copied the Regional Office (Kenedee Ludwar) for consideration of the request below or any viable options which may be available to address the issue noted.

Thank you,
Jessie Bains, P.Eng.
Assistant Operations Manager
District Engineering, FV- LMD
604.795.8210

From: Weightman, Michael [<mailto:Michael.Weightman@icbc.com>]
Sent: Monday, August 26, 2013 9:36 AM
To: Bains, Jessie TRAN:EX
Cc: s.22
Subject: Hwy 1 at Slanzi road

Hello Jessie,

Last week I was up in Boston Bar and was speaking to Cst. Jaret Duncan and I asked him about the intersection a/n and mentioned you and I had spoken about the area. He confirmed the one serious crash involving s.22 a few years ago seems to be a one of type of crash. But he did share with me how unnerving it can be to be driving home to Slanzi road and then pull into the inside (fast) lane then slow down and signal your turn. He finds it does confuse other drivers following up behind him and can get pretty tense and causes some evasive movement when inside lane drivers have to quickly change lanes to avoid him.

Here are a couple of photos of the area, and I wondered if there could be some consideration for signage on both sides of the highway, in both directions, to warn of the intersecting roadway? Is it a WA-13R or something?

Thanks for your consideration.

.....
Mike Weightman

Road Safety Coordinator

Lower Mainland Region,
(Agassiz, Harrison Hot Springs, Chilliwack, Hope and Boston Bar)
ICBC building trust. driving confidence.

.....
46052 Chilliwack Central Road,
Chilliwack B.C. V2P 1J6

direct: 604-702-3837

facsimile: 604-702-3849 | **mobile:** s.22

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From: [Ludwar, Kenedee](#) TRAN:EX
To: [Cross, Graeme D](#) TRAN:EX
Subject: FW: Hwy 1 at Slanzi, Hwy 1 NB Left Turn Issue
Date: Friday, November 15, 2013 3:46:00 PM

Lets discuss the options next week^{s.22}
s.13

s.13

Kenedee Ludwar, P.Eng.
Manager of Traffic Engineering and Highway Design
Phone (604) 527-2255
Cell^{s.17}
Suite 310 – 1500 Woolridge Street, Coquitlam, BC V3K 0B8

From: Yang, Jin Dong TRAN:EX
Sent: Friday, November 15, 2013 8:59 AM
To: Malik, Naasir TRAN:EX
Cc: Crichton, William H TRAN:EX; Kelly, Mike TRAN:EX; Holloway, David L TRAN:EX; Ludwar, Kenedee TRAN:EX; Cross, Graeme D TRAN:EX; Hazlewood, Anne TRAN:EX
Subject: RE: Hwy 1 at Slanzi, Hwy 1 NB Left Turn Issue

Hi Nassir,
Just checked the traffic volume; the ADT is 3326 along the subject area, based on the CIS volume extract.

Jin

From: Malik, Naasir TRAN:EX
Sent: Thursday, November 14, 2013 2:59 PM
To: Hazlewood, Anne TRAN:EX
Cc: Crichton, William H TRAN:EX; Kelly, Mike TRAN:EX; Holloway, David L TRAN:EX; Ludwar, Kenedee TRAN:EX; Cross, Graeme D TRAN:EX; Yang, Jin Dong TRAN:EX
Subject: RE: Hwy 1 at Slanzi, Hwy 1 NB Left Turn Issue

Agreed Anne. I was thinking about something for the short term until we have design in place for the left turn.

Thanks everyone

Naasir Malik, P.Eng., M.Eng
District Engineer
Lower Mainland District
Ministry of Transportation and Infrastructure
Suite 310 - 1500 Woolridge Street, Coquitlam
Phone: 604.527.2235

From: Hazlewood, Anne TRAN:EX
Sent: Thursday, November 14, 2013 1:41 PM
To: Malik, Naasir TRAN:EX; Yang, Jin Dong TRAN:EX; Cross, Graeme D TRAN:EX
Cc: Crichton, William H TRAN:EX; Kelly, Mike TRAN:EX; Holloway, David L TRAN:EX; Ludwar, Kenedee TRAN:EX
Subject: RE: Hwy 1 at Slanzi, Hwy 1 NB Left Turn Issue

All,

I am not sure that shoulder mounted signs are going to adequately address this issue. Some of the motor vehicle incidents at this location occurred when there was a vehicle heading north and making a left into Slanzi, at the same time a second vehicle in the fast lane was passing a slower vehicle in the slow lane. The second vehicle rear ended the vehicle turning left. In this scenario, the drivers in the fast lane would likely not see shoulder mounted signage.s.13

s.13

Thanks,

*Anne Hazlewood
Area Manager
Ministry of Transportation and Infrastructure
South Coast Region
Hope Sub-Office
Office Ph. 604-869-7328
Cell Ph.s.17
e-mail Anne.Hazlewood@gov.bc.ca*

From: Malik, Naasir TRAN:EX
Sent: Thursday, November 14, 2013 12:39 PM
To: Yang, Jin Dong TRAN:EX; Cross, Graeme D TRAN:EX
Cc: Crichton, William H TRAN:EX; Hazlewood, Anne TRAN:EX; Kelly, Mike TRAN:EX; Holloway, David L TRAN:EX; Ludwar, Kenedee TRAN:EX
Subject: RE: Hwy 1 at Slanzi, Hwy 1 NB Left Turn Issue

Hi Jin,

More comments while talking to Dave Holloway...not sure you mean portable message sign or overhead CMS sign. We normally install portable CMS where the message is to be changed and portable where we have to change the location. In this scenario both don't apply...s.13

s.13

Kindly let me know after discussion with

Graeme, which sign from traffic manual or if custom sign is more effective, a sign record is needed. Thank you

Naasir Malik, P.Eng., M.Eng
District Engineer
Lower Mainland District
Ministry of Transportation and Infrastructure

Suite 310 - 1500 Woolridge Street, Coquitlam
Phone: 604.527.2235

From: Malik, Naasir TRAN:EX
Sent: Thursday, November 14, 2013 11:06 AM
To: Yang, Jin Dong TRAN:EX; Cross, Graeme D TRAN:EX; Holloway, David L TRAN:EX
Cc: Ludwar, Kenedee TRAN:EX; Crichton, William H TRAN:EX; Hazlewood, Anne TRAN:EX; Kelly, Mike TRAN:EX
Subject: RE: Hwy 1 at Slanzi, Hwy 1 NB Left Turn Issue

Graeme/Jin,

Dave, how much portable CMS signs will cost . Do we have power source there and feasibility.

Graeme, I would need approved custom sign record produced prior to installation of static signs.
Not sure how this sign will look like, sizing and wording on it based on highway speeds.

Naasir Malik, P.Eng.,M.Eng
District Engineer
Lower Mainland District
Ministry of Transportation and Infrastructure
Suite 310 - 1500 Woolridge Street, Coquitlam
Phone: 604.527.2235

From: Yang, Jin Dong TRAN:EX
Sent: Wednesday, November 13, 2013 11:11 AM
To: Cross, Graeme D TRAN:EX; Crichton, William H TRAN:EX; Malik, Naasir TRAN:EX; Hazlewood, Anne TRAN:EX
Cc: Ludwar, Kenedee TRAN:EX
Subject: RE: Hwy 1 at Slanzi, Hwy 1 NB Left Turn Issue

s.13

Jin

From: Yang, Jin Dong TRAN:EX
Sent: Wednesday, November 13, 2013 10:39 AM

To: Cross, Graeme D TRAN:EX; Crichton, William H TRAN:EX; Malik, Naasir TRAN:EX; Hazlewood, Anne TRAN:EX
Cc: Ludwar, Kenedee TRAN:EX
Subject: RE: Hwy 1 at Slanzi, Hwy 1 NB Left Turn Issue

Hello Graeme, Nassir, Bill and Anne,

I have checked through Google Earth at the location on Hwy 1 at Slanzi Rd and the adjacent area.

s.13



Jin

From: Yang, Jin Dong TRAN:EX
Sent: Monday, November 4, 2013 9:58 AM
To: Cross, Graeme D TRAN:EX
Cc: Ludwar, Kenedee TRAN:EX
Subject: RE: Hwy 1 at Slanzi, Hwy 1 NB Left Turn Issue

Sure.

Jin

From: Cross, Graeme D TRAN:EX

Sent: Monday, November 4, 2013 9:55 AM
To: Yang, Jin Dong TRAN:EX
Cc: Ludwar, Kenedee TRAN:EX
Subject: FW: Hwy 1 at Slanzi, Hwy 1 NB Left Turn Issue

Jin.

Please review the request below and provide a recommendation for left turn safety near Slanzi Road. Thank you.

Graeme Cross, P.Eng.
Senior Traffic Operations Engineer for the South Coast Region
Ministry of Transportation and Infrastructure
Cell: s.17 Office: 604-527-2263 | Graeme.Cross@gov.bc.ca

From: Ludwar, Kenedee TRAN:EX
Sent: Monday, November 4, 2013 8:45 AM
To: Crichton, William H TRAN:EX; Cross, Graeme D TRAN:EX
Cc: Hazlewood, Anne TRAN:EX; Malik, Naasir TRAN:EX
Subject: RE: Hwy 1 at Slanzi, Hwy 1 NB Left Turn Issue

Bill – My apologies. I had attempted to forward this on, but saved it as a draft and never sent it.

Graeme- Can you have someone look into this request ASAP.

Kenedee

Kenedee Ludwar, P.Eng.
Manager of Traffic Engineering and Highway Design
Phone (604) 527-2255
Cell s.17
Suite 310 – 1500 Woolridge Street, Coquitlam, BC V3K 0B8

From: Crichton, William H TRAN:EX
Sent: Monday, November 4, 2013 8:17 AM
To: Ludwar, Kenedee TRAN:EX
Cc: Hazlewood, Anne TRAN:EX; Malik, Naasir TRAN:EX
Subject: Hwy 1 at Slanzi, Hwy 1 NB Left Turn Issue

Kenedee,

Can you provide a follow up to Jessie's email regarding this status of this review? Thanks.

Bill Crichton
District Technician
310 – 1500 Woolridge St.
Coquitlam, BC
V3K 0B8
Tel: 604-527-2239

From: [Schmidt, Karen TRAN:EX](#)
To: [Malik, Naasir TRAN:EX](#)
Cc: [Bains, Jessie TRAN:EX](#)
Subject: Highway 1 and Slanzi Road/Canyon Alpine, Boston Bar
Date: Thursday, February 2, 2012 9:39:34 AM
Attachments: [20120202091807.pdf](#)

Please find attached a letter from Thomas to Mr. Forman, Electoral Area A, Fraser Valley Regional District.

Karen Schmidt

District Clerk

Ministry of Transportation and Infrastructure

Chilliwack Area Office

45890 Victoria Avenue

Chilliwack BC V2P 2T1

Phone: (604)795-8211

Fax: (604)795-8214

From: [Holloway, David L TRAN:EX](#)
To: [Bains, Jessie TRAN:EX](#)
Cc: [Danvers, Ron G TRAN:EX](#)
Subject: RE: Boston Bar Area Street Light
Date: Friday, October 5, 2012 2:18:41 PM

Hi Jesse,

I can't seem to find this on Google so I will need bit more info to review with Hydro...

Comment, if there is the PED traffic as indicated in the letter maybe engineering should run the warrants to see if we should be installing lighting as a matter of business.

That said here is the skinny on lease lights based on our past experience on the Sunshine Coast....

Where BC Hydro secondary voltage is available on the pole, meaning 120/240V the cost is only a few hundred \$'s to install the light and then \$150/year. Where no secondary power is available, meaning BC Hydro have to install a transformer its between \$3K and \$4K for the transformer and then the yearly fee.

Where no pole exist for a lease light, we would need to install a service and poles cost can be \$10K to \$20K depending on scope...

So for pic 522 no transformer so \$3K to \$4K will be required.

Pic 523 no hydro or pole, \$10k to \$20K

Pic 524, looks like a transformer and secondary is existing so this one would \$500 to install and then \$150/year to operate.

Lets chat next week..

David Holloway
Manager, Electrical Services
Ministry of Transportation
Phone: 604-660-8298
Fax: 604-660-8371
e-mail: David.Holloway@gov.bc.ca

From: Bains, Jessie TRAN:EX
Sent: Friday, October 5, 2012 12:34 PM
To: Holloway, David L TRAN:EX
Cc: Kelly, Mike TRAN:EX
Subject: FW: Boston Bar Area Street Light

David, is there any opportunity to provide some type of lease lighting through BC Hydro for this location? (ie., East of Boston Bar THC/Slanzi). There does not appear to be any Power Poles at the intersection leg in question...something to look into if there is any possibility to address. School

Bus, Children... being referenced.

Jessie

From: Hazlewood, Anne TRAN:EX
Sent: Friday, October 5, 2012 12:20 PM
To: Bains, Jessie TRAN:EX
Cc: Crichton, William H TRAN:EX; Kelly, Mike TRAN:EX
Subject: FW: Boston Bar Area Street Light

Hi Jessie,

This email came to me yesterday.

This is the same intersection that we have the complaint/request for a left turn slot from Hwy 1 to Slanzi Rd.

Not sure how they are hoping to fund this, I have asked that question via email.

Perhaps a site visit would be a good idea.

Thanks,

Anne Hazlewood
Area Manager
Ministry of Transportation and Infrastructure
South Coast Region
Hope Sub-Office
Office Ph. 604-869-7328
Cell Ph. s.17
e-mail Anne.Hazlewood@gov.bc.ca

From: Alan Chiang [<mailto:achiang@fvrd.bc.ca>]
Sent: Thursday, October 4, 2012 11:44 AM
To: Hazlewood, Anne TRAN:EX
Cc: Tareq Islam
Subject: Boston Bar Area Street Light

Hi Anne:

This is to follow up my voice message to you earlier this morning.

A Boston Bar resident made several complaints about the lack of light along Slanzi Road and sight safety issue at the Highway 1 intersection.

I propose two additional lease lights be installed: one along Slanzi Road and one across from the intersection at Pfenniger Road.

Please find the attached resident's letter, site plan, and photographs. I can drop by your office to discuss this matter further with you. I'm available next week on the 10th to the 12th; let me know what works with you.

Thanks.

Alan Chiang, Engineer in Training
Engineering Community Services Coordinator
Fraser Valley Regional District
45950 Cheam Ave
Chilliwack B.C.
V2P 1N6
Direct 604-702-5025
Cell s.22
Toll Free 1-800-528-0061
achiang@fvrd.bc.ca
www.fvrd.bc.ca

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From: [Bains, Jessie TRAN:EX](#)
To: [Holloway, David L TRAN:EX](#)
Subject: RE: Boston Bar roadway light
Date: Monday, November 4, 2013 12:02:00 PM

Thanks Dave...

From: Holloway, David L TRAN:EX
Sent: Monday, November 4, 2013 11:24 AM
To: Bains, Jessie TRAN:EX
Subject: FW: Boston Bar roadway light

As far as I know the issue has been addressed, see below and attached email from Al McMillian.

David Holloway
Manager, Electrical Services
Ministry of Transportation
Phone: 604-527-2230
Fax: 604-527-2222
e-mail: David.Holloway@gov.bc.ca

From: Alan Chiang [<mailto:achiang@fvrd.bc.ca>]
Sent: Friday, January 4, 2013 10:31 AM
To: Holloway, David L TRAN:EX
Subject: RE: Boston Bar roadway light

Great thank you! Alan

From: Holloway, David L TRAN:EX [<mailto:David.Holloway@gov.bc.ca>]
Sent: Friday, January 04, 2013 10:21 AM
To: Alan Chiang
Subject: RE: Boston Bar roadway light

Good morning Alan,

Thanks for the details. If for some strange reason you don't hear from anyone in Development Approvals by mid next week drop me a note and I will give them a friendly call.

Regards,

David Holloway
Manager, Electrical Services
Ministry of Transportation
Phone: 604-660-8298
Fax: 604-660-8371
e-mail: David.Holloway@gov.bc.ca

From: Alan Chiang [<mailto:achiang@fvrd.bc.ca>]

Sent: Friday, January 4, 2013 10:18 AM

To: Holloway, David L TRAN:EX; Neill, Mike D TRAN:EX; Powers, Jennifer TRAN:EX; Ferguson, James TRAN:EX

Subject: RE: Boston Bar roadway light

Hi:

The FVRD intends to install a private pole c/w overhang electrical wire and a davit light in the Boston Bar area.

Attached are the location plan and a site photo for your reference. The pole is to be installed at the gravel shoulder on Slanzi Road with standard offset distance from the edge of pavement that matches the rest of the area. The car in the photo represents the approximate location of the pole.

Please advise if a MoTI permit is required for this application.

Thanks.

Alan Chiang, Engineer in Training
Engineering Community Services Coordinator
Fraser Valley Regional District
45950 Cheam Ave
Chilliwack B.C.
V2P 1N6
Direct 604-702-5025
Cell 604-845-0479
Toll Free 1-800-528-0061
achiang@fvrld.bc.ca
www.fvrld.bc.ca

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From: Holloway, David L TRAN:EX [<mailto:David.Holloway@gov.bc.ca>]

Sent: Thursday, January 03, 2013 1:57 PM

To: Alan Chiang; Neill, Mike D TRAN:EX; Powers, Jennifer TRAN:EX; Ferguson, James TRAN:EX

Subject: Boston Bar roadway light

Good afternoon,

I was speaking to Alan Chiang (604-702-5025) from FVRD and they want to install a street light on a private pole on a side street near our Hwy. Alan is asking if he needs a permit for the work.

I hoping one of you can help with his request?

Alan if you could reply all with a Google image of your proposed location it will help our Development Approval group to determine if the road is ours and whether a permit is required.

Regards,

David Holloway
Manager, Electrical Services
Ministry of Transportation
Phone: 604-660-8298
Fax: 604-660-8371
e-mail: David.Holloway@gov.bc.ca

From: [Chhun, Thomas TRAN:EX](#)
To: [Hazlewood, Anne TRAN:EX](#)
Cc: [Crichton, William H TRAN:EX](#); [Malik, Naasir TRAN:EX](#); [Bains, Jessie TRAN:EX](#)
Subject: Re: Hwy 1 at Slanzi Road (Canyon Alpine) in Boston Bar
Date: Wednesday, April 18, 2012 7:28:07 PM

Anne:

I provided a response to the letter saying that we would complete a warrant analysis. I will provide a copy of the letter when I am back in the office.

I left it with Jessie and Naasir to follow up with.

Thank you.

Regards,

Thomas Chhun
District Operations Manager
Lower Mainland District
Howe Sound/Sunshine Coast
Ministry of Transportation and Infrastructure

From: Hazlewood, Anne TRAN:EX
Sent: Wednesday, April 18, 2012 04:55 PM
To: Chhun, Thomas TRAN:EX
Cc: Crichton, William H TRAN:EX
Subject: FW: Hwy 1 at Slanzi Road (Canyon Alpine) in Boston Bar

Hi Thomas,

Could you please provide an update on this issue. I believe you did the response but I cannot find anything in my emails.

Thanks,

Anne Hazlewood

Area Manager

Ministry of Transportation and Infrastructure

South Coast Region

Hope Sub-Office

Office Ph. 604-869-7328

Cell Ph. ^{s.17}

e-mail Anne.Hazlewood@gov.bc.ca

From: Schmidt, Karen TRAN:EX
Sent: Monday, December 19, 2011 1:34 PM
To: Hazlewood, Anne TRAN:EX; Bains, Jessie TRAN:EX; Malik, Naasir TRAN:EX
Cc: Chhun, Thomas TRAN:EX
Subject: Hwy 1 at Slanzi Road (Canyon Alpine) in Boston Bar

Good afternoon,

For discussion with Thomas....

<<20111219133135.pdf>>

Karen Schmidt

District Clerk

Ministry of Transportation and Infrastructure

Chilliwack Area Office

45890 Victoria Avenue

Chilliwack BC V2P 2T1

Phone: (604)795-8211

Fax: (604)795-8214

From: [Schmidt, Karen TRAN:EX](#)
To: [Hazlewood, Anne TRAN:EX](#); [Bains, Jessie TRAN:EX](#); [Malik, Naasir TRAN:EX](#)
Cc: [Chhun, Thomas TRAN:EX](#)
Subject: RE: Hwy 1 at Slanzi Road (Canyon Alpine) in Boston Bar
Date: Tuesday, August 21, 2012 2:15:36 PM
Attachments: [20120821141115.pdf](#)

Hi Anne,

Attached is a response from Thomas to Lloyd Forman on the above noted issue....

Karen

From: Hazlewood, Anne TRAN:EX
Sent: Tuesday, August 21, 2012 1:31 PM
To: Schmidt, Karen TRAN:EX; Bains, Jessie TRAN:EX; Malik, Naasir TRAN:EX
Cc: Chhun, Thomas TRAN:EX
Subject: RE: Hwy 1 at Slanzi Road (Canyon Alpine) in Boston Bar

All,

Can anyone please tell me the status of this complaint?

<< File: 20111219133135.pdf >>

Thanks,

Anne Hazlewood

Area Manager

Ministry of Transportation and Infrastructure

South Coast Region

Hope Sub-Office

Office Ph. 604-869-7328

Cell Ph. ^{s.17}

e-mail Anne.Hazlewood@gov.bc.ca

From: Schmidt, Karen TRAN:EX
Sent: Monday, December 19, 2011 1:34 PM
To: Hazlewood, Anne TRAN:EX; Bains, Jessie TRAN:EX; Malik, Naasir TRAN:EX
Cc: Chhun, Thomas TRAN:EX
Subject: Hwy 1 at Slanzi Road (Canyon Alpine) in Boston Bar

From: [Yang, Jin Dong TRAN:EX](#)
To: [Malik, Naasir TRAN:EX](#); [Cross, Graeme D TRAN:EX](#)
Cc: [Crichton, William H TRAN:EX](#); [Hazlewood, Anne TRAN:EX](#); [Kelly, Mike TRAN:EX](#); [Holloway, David L TRAN:EX](#); [Ludwar, Kenedee TRAN:EX](#)
Subject: RE: Hwy 1 at Slanz, Hwy 1 NB Left Turn Issue
Date: Thursday, November 14, 2013 2:09:19 PM

Thanks, Nassir.

In the subject area, there are about 6 accesses onto the highway from both sides within about 1 km. If we use the hidden driveway or concealed road signs, can we or how efficient if we install the signs for each access on both NB and SB.

Further, a concealed sign is mostly for an access on right or cross; while in this 1 km long section, the accesses are staggered; the complaint more concerns the situation when a vehicle stop or slow down for a left turning and other vehicles behind it keep driving at a higher speed or the regular speed on the highway. So the sign for hidden road on right or concealed road cross doesn't apply to this issue.

Through the Google Earth, I see that in the subject area, the sight distance for the posted speed is sufficient, and there is not vision limit for and one of the left hand side accesses, no matter on NB or SB. So a sign for a hidden road on left would not tell the drivers of the situation as the complaint concerns.

As for the CMS, I don't think the locations need to change, and to decide which style (either overhead or mounted to poles) to be used, it depends on the cost, I guess.
For the wording, the word of ATTENTION might not be proper; CAUTION might be?

Jin

From: Malik, Naasir TRAN:EX
Sent: Thursday, November 14, 2013 12:39 PM
To: Yang, Jin Dong TRAN:EX; Cross, Graeme D TRAN:EX
Cc: Crichton, William H TRAN:EX; Hazlewood, Anne TRAN:EX; Kelly, Mike TRAN:EX; Holloway, David L TRAN:EX; Ludwar, Kenedee TRAN:EX
Subject: RE: Hwy 1 at Slanz, Hwy 1 NB Left Turn Issue

Hi Jin,

More comments while talking to Dave Holloway...not sure you mean portable message sign or overhead CMS sign. We normally install portable CMS where the message is to be changed and portable where we have to change the location. In this scenario both don't apply....In my opinion all we need is hidden driveway or concealed road signs. Kindly let me know after discussion with Graeme, which sign from traffic manual or if custom sign is more effective, a sign record is needed.
Thank you

From: [Derkson, Debra TRAN:EX](#)
To: [Malik, Naasir TRAN:EX](#)
Cc: [Crichton, William H TRAN:EX](#); [Bains, Jessie TRAN:EX](#)
Subject: Revised Draft of Lower Mainland District Traffic Meeting Minutes
Date: Friday, July 26, 2013 8:47:22 AM
Attachments: [July 3.doc](#)

Hi Naasir,

Attached is the revised draft. I forgot to add Bill Crichton's item Hwy 99 @ 8th Avenue Reconfiguration east RA signing and paint lines.

Debbie Derkson

District Clerk

Ministry of Transportation & Infrastructure

Lower Mainland District

Telephone: 604-660-9819

Email address: Debra.Derkson@gov.bc.ca



**Ministry of Transportation
Terms of Reference**

**Corridor Safety Study
Trans Canada Highway 1
(Hope to Cache Creek)**

Issue date: April 25, 2006

Contact person:

**Grant Irvine, P. Eng.
Sr. Transportation Planning Engineer
Phone: 250-828-4997
Email: Grant.Irvine@gov.bc.ca**

**Ministry of Transportation
Southern Interior Region
523 Columbia Street
Kamloops, B.C. V2C 2T9**

Proposals must be received by 4:00 PM PDST May 5, 2006

**Proposals sent by email must be delivered to the email address above.
Proposals sent by hand, mail, or courier must be delivered to the address above.**

1.0 Background

Trans Canada Highway 1 (TCH) through the rugged Fraser and Thompson Canyons is designated as a national and provincial, primary highway route providing an important link to the central and northern interior of the province.

Given the challenging terrain, safety, mobility and reliability along the route often come under scrutiny as any potential closures would significantly increase trip lengths and travel times via alternative routes. This is a particular concern for the trucking industry that relies heavily on this route.

In September 2003, Urban Systems Ltd. completed a technical report that provided a broad scan of corridor safety and mobility performance on the TCH between the Southern Interior Regional Boundary, some 17km south of Lytton and Cache Creek. Some preliminary recommendations were presented for Ministry consideration and follow up, although detailed engineering to confirm feasibility and costs was not part of the report.

Recently completed highway improvement initiatives include, Skuppa Rest Area (road geometry improvements), Nicomen Creek Bridge (improvements to bridge railings and warning signage), Thompson River Bin Wall (replacement), Spences Bridge (re-decking, new sidewalks and railings) and Oregon Jack area, north of Spences Bridge (replacement of retaining walls).

The Ministry is currently reviewing potential options to address 'truck-roll-over' concerns in the Marshall Mountain area, in the vicinity of the CP Railway Mainline. (Thompson Siding - located at approximately LKI segment 910, km 20.0).

The BC Trucking Association has recently raised a number of site specific safety concerns along the route and has requested the Ministry of Transportation (Ministry) review these and any potential improvement actions that might be taken.

2.0 Project Objectives

This assignment is co-sponsored by the Ministry's South Coast Region and the Southern Interior Region.

The intent of this assignment is to develop recommendations, for consideration by the Ministry, on the scope and priority for candidate safety improvements on the TCH corridor between the Hope and Cache Creek and how they might be implemented consistently.

This work is necessary to ensure that the province can effectively prioritize and allocate our limited budgets in an efficient manner that will maximize benefit to all users.

While the recommended safety improvements will benefit all highway users, the primary focus of this assignment is to focus on site specific areas as identified by the BC Trucking Association.

The findings produced in this assignment are to be integrated as component of future corridor management planning work.

3.0 Scope

The following outlines the scope of work under this assignment.

3.1 Study Area – The TCH highway corridor between the junction of TCH 1/Highway 7 just east/north of Hope and the junction of TCH 1/Highway 97 North at Cache Creek.

All location referencing shall use the Ministry's Landmark Kilometer Referencing (LKI) system, including segments 905, 910, 915 and 917.

3.2 Project Initiation – Upon Contract award, the Project Team to assemble with the Consultant to review the following:

- Identify and introduce project team members and sources of information. A list of information sources are provided in Appendix A. A summary of recent field trip notes are provided in Appendix B.
- Review details of assignment work plan.
- Confirm Contractual details for scope, resources, schedule, budget and payment.

3.3 Field Visit(s) – The Consultant should be prepared to undertake at least one field visit with representatives from the Ministry's Project Team, during the performance analysis and problem definition phase to familiarize with the local conditions and issues. Subsequent field visits, may also be required at further stages of this assignment to verify accuracy of recommendations.

3.4 Corridor Use

- Current traffic volumes expressed in terms of daily and monthly variation, annual average daily traffic, summer average daily traffic and the 50th highest hour.
- Traffic volumes trends historically and estimated for the next 20 years).
- Trends in vehicle classification on the route, particularly the percentage and volumes of heavy vehicles that are part of the total volume.
- Statement of role and function of this corridor as part of the provincial, national and international transportation system.
- Statement of mobility performance based on previous studies and use.

3.5 Safety Performance

- Based on agreed to collision data, summarize a collision frequency profile of the length of the corridor.
- Over the length of the corridor, identify accident prone locations/sections, locations with particularly high frequency, collision rates, severities (that exceed critical and provincial average rates) and where collision types are over-represented.
- Identify any potential safety problem areas supported by the collision data over the length of the corridor under the following themes:
 - Inconsistencies in posted versus actual travel speeds.
 - Inconsistent, inaccurate or inadequate curve warning, advisory, or other signage.
 - Inconsistencies in positive guidance and/or delineation, including roadside barrier, roadside barrier flares and related signage.

- The Ministry will provide all existing information on file listing defined posted speed zones, radar speed studies, curve testing results and related formats and guidelines for analysis.
- The Consultant will be required to collect and analyze any additional speed survey, or curve testing data deemed necessary to complete the objectives of this assignment.

3.6 Problem Definition and Option Development

- Characterize the nature of identified safety performance problem areas over the length of the corridor and put these into context.
- For each potential problem location including, as a minimum, those identified by the identified by the BC Trucking Association:
 - Quantify and confirm safety performance relative to threshold criteria.
 - Identify collision types, key contributing factors and any over-represented patterns.
 - Identify feasible, least cost improvement options commensurate with the extent of problem and consistent with the causal/contributing factors.
 - Each option is to be developed at a conceptual level of detail, although enough work must be completed to confirm feasibility.
 - For each option, calculate the anticipated collision reduction effectiveness and potential benefits (accrued, 20 year collision savings, based on MicroBENCOST default values).
 - For each option estimate, implementation cost estimates and identify level of confidence in any cost estimates and/or the scope of further work needed to confirm costs.

3.7 Recommendations

- Provide an implementation plan including a recommended list of prioritized safety improvements, based on need, staging and affordability.
- Identify any opportunities and timing to combine scope of recommended safety improvements with planned rehabilitation projects in the future.

4.0 Project Structure and Resources

Project Manager/Administration:

Grant Irvine, Senior Transportation Planning Engineer, Southern Interior Region

Project Sponsorship and Resources:

South Coast Region

- Tracy Cooper, Regional Director
- Patrick Livolsi, Regional Manager, Engineering, South Coast Region
- Barry Eastman, Operations Manager, Chilliwack
- Martin, Madelung, Manager, Rehabilitation & Maintenance

Southern Interior Region

- Kevin Richter, Regional Director
- Shawn Grant, Regional Traffic Engineer
- Sherry Eland, District Manager, Transportation, Thompson-Nicola
- Dave Schleppe, District Program Manager, Thompson-Nicola

- Harvey Nelson, Operations Manager, Thompson-Nicola
- Todd Hubner, District Manager, Transportation, Cariboo
- Norm Parkes, Regional Manager, Planning & Partnerships
- Jim Richardson, Regional Transportation Engineer
- Mike Walsh, Regional Manager, Operations

5.0 Deliverables, Budget and Schedule

Deliverables: All reports and information presented must be formatted in a concise and logically organized manner for effective reference, including text, tables, graphics and appendices of all supporting information. The Consultant will be expected to submit draft reports and a final report, complete with executive summary, all in digital format. Prior to finalization of reporting, the Consultant will be expected to prepare and deliver a presentation of findings (in power point format) to Ministry (and possibly other stakeholder) representatives for information and feedback.

Budget: The budget for this project shall not exceed \$20,000.

Schedule: The schedule for the project is as follows:

- Project Initiation and Initial Field Visit – before May 19th, 2006
- Draft Reports and Preliminary Recommendations – before June 19th, 2006
- Power Point Presentation – TBA (early July; not later than end of August)
- Final Reports / Products – TBA (no later than end of September 2006)

The above schedule is intended to provide a framework for key delivery dates. The Consultant will be expected to provide more specific timelines and delivery dates based on the proposed work plan, including any necessary incremental meetings, field visits, working paper reviews, etc.....

6.0 Consultant Responsibility

With respect to the project, the Consultant shall be responsible for the following:

- 1) Determining the extent of all previous work conducted; collecting, compiling and reviewing this information; obtaining any additional information required.
- 2) Maintaining effective liaison with project team members from the Ministry and other partners through regular contact and scheduled meetings. Where applicable, the Consultant will be expected to liaise with all relevant Ministry groups responsible for Highway Operations/District, Engineering (Traffic/Design/Bridge/Geotechnical/Environmental), Programming & Partnerships (including Planning & Properties) as necessary to satisfy the requirements of the assignment.

As required, liaison with all impacted agencies, property owners, etc., as identified by the Consultant, and approved by the Ministry.

- 3) Maintaining the project on the agreed schedule.

Maintaining, for all tasks under this assignment, an up-to-date scheduling and cost control system capable of identifying impacts on subsequent components of the project (i.e. Critical Path Analysis).

Prepare monthly progress reports for the Project Manager to review:

- The previous month's progress
- Issues resolved
- New issues identified
- Outline of work proposed for next month
- Cost and schedule update

The objective is to ensure the assignment stays on schedule and within the scope and approved budget of the assignment. The Consultant shall produce and transmit to the Ministry, Monthly Progress Reports in an approved format, based on the material presented and reviewed at this meeting.

- 4) Provide invoices on all work performed within 30 days of work being performed.
- 5) Document all meeting minutes related to this project.

7. Ministry Responsibility

With respect to the project, the Ministry will be responsible for the following:

- 1) Providing any available pertinent reports and inventories that will assist in the assignment.
- 2) Approval of all scope changes, cost changes from the approved budget, and schedule changes which impact the project schedule.
- 3) Approval of all sub-consultants assigned work on the project.
- 4) Liaising with agencies external to the Ministry, where applicable.
- 5) Monitor progress against the terms of the agreement, including quality, to check for adherence to the standards and established budget. Such review does not in any way relieve the Consultant of responsibility for errors or omissions or for compliance with the agreement.
- 6) From time to time during the contract, perform evaluations on the quality of work and services being provided by the Consultant.

8.0 Proposal Terms and Conditions

- 1) A letter proposal of approximately 5 pages shall be submitted to the Ministry Project Manager at Southern Interior Regional Planning Office no later than May 5th, 2006, 4:00 PM PDST. The proposal shall outline all activities to be undertaken in this assignment.
- 2) The term of the assignment shall follow the required schedule outlined in the Terms of Reference.

- 3) The proposal shall outline the details of compensation for this assignment (either full lump sum or progress payments based on delivery of defined product milestones).
- 4) The proposal must identify the specific personnel assigned, including a brief summary of experience. It is expected that assigned personnel will continue for the duration with no changes or alternates unless approved by the Project Manager.
- 5) With the exception of project meeting facilities arranged by the Project Manager, the Consultant must provide their own office facilities, equipment, office supplies and materials to conduct business and work on this project.
- 6) Travel expenses and other costs will be covered at defined Ministry rates for a Group I employee.
- 7) The proposal shall be good for 30 days from submission. The lowest or any proposal may not necessarily lead to a Contract.

Appendix B

Ministry of Transportation Field Trip Summary Notes

This information is not intended to assist in defining potential problem areas and possible improvement options. However, the following information should not be considered a complete list of issues and improvement options.

Comments accumulated on separate field trips through the study area on:

- February 22, 2006 – Including Ministry and BCTA Staff
 - Paul Landry, BCTA
 - Greg Mulvihill, BCTA
 - Tracy Cooper, MoT
 - Kevin Richter, MoT
- April 20, 2006 – Including Ministry Staff only
 - Tracy Cooper, MoT
 - Kevin Richter, MoT
 - Patrick Livolsi, MoT
 - Martin, Madelung, MoT
 - Todd Hubner, MoT
 - Dave Schleppe, MoT
 - Harvey Nelson, MoT
 - Shawn Grant, MoT
 - Grant Irvine, MoT

General Comments / Considerations

- Consistency and proactive road maintenance
- Consistency in road classification/design
- Centerline and Shoulder Rumble Strips – a valued measure; ensure installed where appropriate
- Painted Lines – difficult to see when worn or covered by snow and winter abrasives; repaint worn areas early as possible
- Signage – need to review existing signs for consistency over entire section; replace faded signs (primarily north bound); clean dirty signs; upgrade to diamond grade reflectivity; consider developing Fraser Canyon Truck Safety Information Signs/Canyon Watch Signs to off-set aggressive driving; more curve warning (starbursts and flashers?)
- Roadside Barrier – transitions at tunnel access
- Shoulder Reflectors – are appreciated by all; consider adding more; (night time visibility issue?)
- Transverse Rumble Strips – consider use at high frequency collision areas
- Rest Areas – open year round; such as Haig, top of American Mountain, Natural
- Construction Traffic Control – educate contractors on use of traffic control devices and procedures; particularly for advance warning in sight limited areas
- Drive BC – provide more information on closure types and when to anticipate reopening of highway

Specific Areas

1. **Bell Crossing / East Side of Yale Tunnel - priority 5 of 11**
 - a. Issues – curvilinear; north bound traction on the hill; south Bound off-roads to right side
 - b. Options – lighted alert signs for southbound; radar activated speed alert sign (BCTA #2 priority site for speed board)
2. **CP Corners – priority 11 of 11**
 - a. Issues – curvilinear section, located approx. 30-40km north of Hope (LKI segment 905, km 30-34); road bounded by rock on the west and railway on the east; headlights from north bound trains
 - b. Options – light diffusing fences between railway and highway; improve signage; install a barrier
3. **Curved Tunnels (Alexandria and China Bar) - priority 4 of 11**
 - a. Issues – curved tunnels, no shoulders; poor lighting (particularly Sailor Bar)
 - b. Options – widen tunnel, improve lighting, better signage, review speed zone/warning sign locations, transverse rumble strips, flashing caution lights, improved warning signage, radar activated speed alert sign (BCTA lower priority)
4. **Curve East of Kanaka Bar – priority 6 of 11**
 - a. Issue 1 – curve east of Kanaka Bar (approx. LKI segment 905, km 94), curvilinear, north bound off-road right side (north bound positive guidance?)
 - b. Issue 2 - north of Jackass Flats, passing lane too short and poor sight distance (clarify location; LKI segment 905, km 95-95?)
 - c. Options 1- improve signage (chevrons?); install, or improve barrier
 - d. Options 2 - review passing opportunities and modify or close
5. **Skuppa Rest Area – priority 9 of 11**
 - a. Issue 1 – Skuppa Rest Area, fixed the south bound problem by removing passing lane, surface modifications and wider shoulder; have concerns on the 2nd curve (need clarification on issue)
 - b. Issue 2 – South of Skihist Park, curvilinear, north bound and south bound, poor super-elevation and narrow shoulder (need to clarify issue)
 - c. Options 1 - monitor or improve signage on 2nd curve (perhaps additional reminder for 70kmh curve warning?)
 - d. Options 2 – change super-elevation, widen shoulder, improve signage
6. **Top of Tank Hill - priority 8 of 11**
 - a. Issue – curvilinear, first curve concern, south bound only (need clarification exactly where; picking up speed on downgrade, or unmarked sharp curve at crest?)
 - b. Options – improve signage, change super-elevation, review alignment

7. Snake Pit - priority 10 of 11
 - a. Issue - curvilinear, narrow, sometimes floods, south bound is worse
 - b. Options - improve signage
8. Nicomen Creek Bridge - priority 1 of 11
 - a. Issue - curvilinear, narrow, limited sight distance
 - b. Options - improve south bound signage (larger); light signs Nicomen Creek Bridge; radar activated speed sign? (In recent years, 2003, the bridge railings and warning signage were improved; in this case the impact and safety record since needs to be measured; also need to establish criteria when/where MoT would agree to install radar speed signs)
9. Thompson Siding (Marshall Mountain) - priority 7 of 11
 - a. Issue - curvilinear; Ministry currently reviewing some options to address the risk of truck roll-overs onto the railway tracks.
 - b. Options - improve south bound signage (larger); light signs; see report on Marshall Mountain Project Scope Development (Urban Systems April 2006); note radar speed signs are part of the options recommended, again why install here, versus at Nicomen?
10. Kingsway Corner - priority 3 of 11
 - a. Issue - south of Kingsway cut, curvilinear
 - b. Options - improve north bound signage (large 60kmh signs); improve super-elevation in the hollow; review the alignment
11. Bottom of Oregon Jack (Spatzum Bluffs) - priority 2 of 11
 - a. Issue - curvilinear, super-elevation (needs clarification); prone to rock falls onto roadway
 - b. Options - improve signage (larger signs; add chevrons and reflectors?); improve super-elevation



Ministry of Transportation

DRAFT

Highway 1, Hope to Cache Creek Safety Assessment PHASE 1 INTERIM REPORT



This report was prepared by ND LEA Inc. (ND LEA). The disclosure of any information contained in this report is the sole responsibility of the client. The material in this report reflects ND LEA's best judgment in light of the information available to it at the time of preparation. Any use of which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. ND LEA accepts no responsibility for damages, if any, suffered by a third party as a result of decisions made or actions based on this report.

Project 82002-061
August 2006



ND LEA Inc.

236 St. Paul Street
Kamloops, BC V2C 6G4
(250) 828 1511
www.ndlea.com

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1 INTRODUCTION

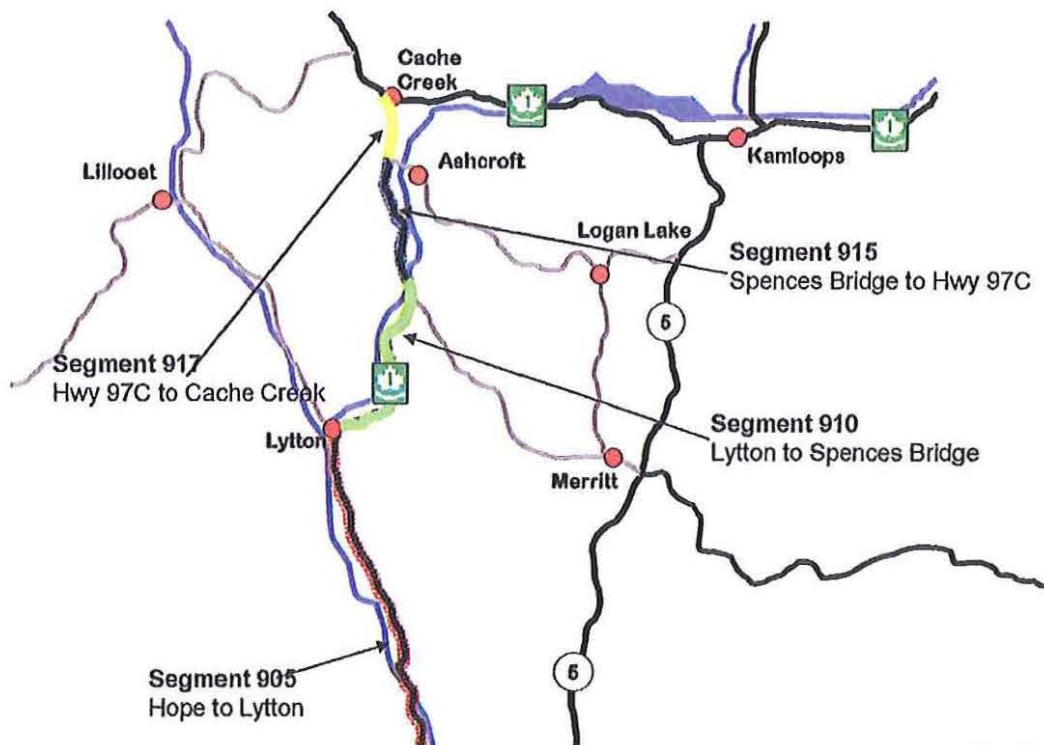
Highway 1 between Hope and Cache Creek is an important component of the provincial highway system. While that importance faded somewhat with the construction of the Coquihalla Highway in the late 1980's and early 1990's, Highway 1 remains an important route particularly as a connection to Northern British Columbia. The economic growth in the North related to oil and gas, pine beetle harvest and increased economic activity in the mining sector have resulted in greater demand for travel and goods movement between the northern half of the province and the Lower Mainland.

The growing demand, particularly for trucking along this route has generated in safety concerns associated with the highway. Unlike several other major corridors in the province, there has been no corridor management plan (CMP) completed for the Hope to Cache Creek section. Therefore, completion of a safety assessment is timely as it will help to address and better define safety concerns, and will provide important input to a future CMP exercise. This report provides an overview of Phase 1 of a safety assessment related to the Trans Canada Highway through the Fraser and Thompson Canyons (Hope to Cache Creek). This initial phase is focussed on the overall corridor and will lead to a second phase that examines specific problem locations and potential solutions.

1.1 Study Area

The study area includes the majority of LKI Segment 905, and all of Segments 910, 915 and 917, starting at the south end of the Fraser River Bridge in Hope and extending north to the Highway 1/97 Junction in Cache Creek. The study area is shown on Figure 1.1.

Figure 1.1: Study Area



1.2 Corridor Description

Highway 1 within the study area is a north-south primary arterial highway that is predominantly a two-lane rural facility. It is part of the National Highway System and until the construction of the Coquihalla Highway, was the primary connection between the Lower Mainland and the rest of Canada. The role as an east-west interprovincial route has diminished, but is still an important alternative to the Coquihalla Highway because of the lower elevation. Also, while there are steep grades on several sections of the Highway 1 route, the Coquihalla has several long, steep grades with a greater net change in elevation, which is of particular concern for trucks.

As noted previously, the Highway 1 route from Hope to Cache Creek is the primary connection between the Lower Mainland and Northern BC. The recent economic growth related to resource industries in the North is once again placing greater importance on this corridor as a goods movement route, and therefore increasing demand for truck travel.

The highway is mountainous in nature with several speed advisory zones. There are short sections of four-lane within the communities of Hope and Cache Creek that are urban in nature. The remainder of the highway is rural, with relatively few passing lanes. Because of the rugged nature of the surrounding terrain through much of the corridor, passing opportunities are limited, as is the feasibility of developing passing lanes or four-lane sections. In addition, the highway parallels the railway corridor and rivers through much of its length, further limiting the potential for highway expansion.

Table 1.1 provides a summary of the corridor description. Appendix A provides a representation of the route profile as well as the posted speed and truck climbing speed estimates.

Table 1.1: Corridor Description Summary

	LKI Segment 905	LKI Segment 910	LKI Segment 915	LKI Segment 917
Location	Hope to Lytton	Lytton to Spences Bridge	Spences Bridge to Hwy 97C (west of Ashcroft)	Hwy 97C to Cache Creek
Length	108.5 km	36.4 km	44.3 km	4.6
Estimated 2006 AADT	4,450	3,500	3,550	4,300
Communities	Hope Yale Boston Bar Lytton	Spences Bridge		Cache Creek
Posted Speeds	Ranges from 50 km/h to 100 km/h	100 km/h	70 km/h, 100 km/h	Ranges from 50 km/h to 100 km/h
Average Posted Speed	90.6 km/h	99.3 km/h	98.6 km/h	90.8 km/h
Number of Speed Advisory Zones	24	22	6	0
Terrain	Flat to Mountainous	Rolling to Mountainous	Generally Rolling	Generally Rolling
Average Grade (absolute)	2.4%	2.2%	1.3%	2.5%
Length of 2-lane	107.2 km	36.4 km	42.3 km	0 km
Length of 4-Lane	1.26 km	0 km	2.3 km	4.6 km
Length of Northbound Passing Lanes	30.7 km	11.4 km	12.1 km	0 km
Length of Southbound Passing Lanes	34.2 km	12.4 km	4.0 km	3.3 km

1.3 Study Approach

This study includes two phases. This first phase is focused on assessing the safety performance of the overall corridor on the basis of existing collision databases. The result of this first phase will be the identification of specific collision prone locations to be studied further. The upcoming second phase will address the collision-prone locations in more detail, providing an assessment of causal effects related to collisions and suggestions of potential mitigation measures. Phase 2 will also include discussions with various stakeholders regarding the identified collision-prone locations.

The major tasks associated with Phase 1 included:

- drive-through of the study corridor with Ministry of Transportation staff to view and discuss specific areas of concern;
- review of MoT HAS database information and calculation of collision rates in 5 km moving segments, with a comparison against provincial average rates;

- calculation of average truck collision rates and comparison against other “competing” highways in the area;
- 24-hour manual classification count at two locations to better establish existing corridor use; and
- identification of collision prone locations / sections for review in Phase 2.

1.4 Project Objectives

This study is co-sponsored by the Ministry’s South Coast Region and the Southern Interior Region. The intent is to develop recommendations on the scope and priority for candidate safety improvements on the TCH corridor between the Hope and Cache Creek and how they might be implemented consistently.

This will help the Ministry to effectively prioritize and allocate limited budgets in an efficient manner that will maximize benefit. While the recommended safety improvements will benefit all highway users, a primary focus of this assignment is to focus on site-specific areas as identified by the BC Trucking Association.

The findings produced in this assignment will be integrated as component of future corridor management planning work.

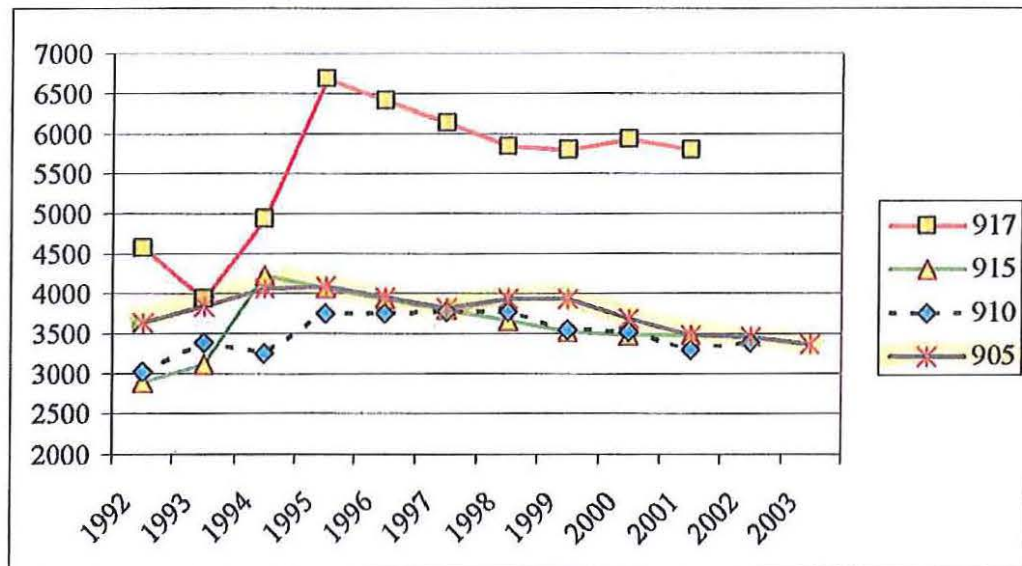
2 CORRIDOR USE

This section provides a summary of the existing and historical corridor use, with a particular emphasis on trucking.

2.1 Historical Trends

There has been a steady decline in traffic volumes over the past decade on this corridor, with an estimated rate of decline in the order of 2.0% annually. Figure 2.1 shows the historical Average Annual Daily Traffic (AADT) for each segment.

Figure 2.1: Historical AADT Volumes



As Figure 2.1 illustrates, the volume on Segment 917 through Cache Creek is considerably higher than on the other segments, reflecting the local use of the highway, as well as travel between Cache Creek and Ashcroft.

A permanent count station is located on Segment 905 at China Bar (Station P-27-1). Table 2.1 provides a summary of the historical AADT and SADT volumes at the count station.

Table 2.1: Historical AADT and SADT volumes, Station P-27-1 (China Bar)

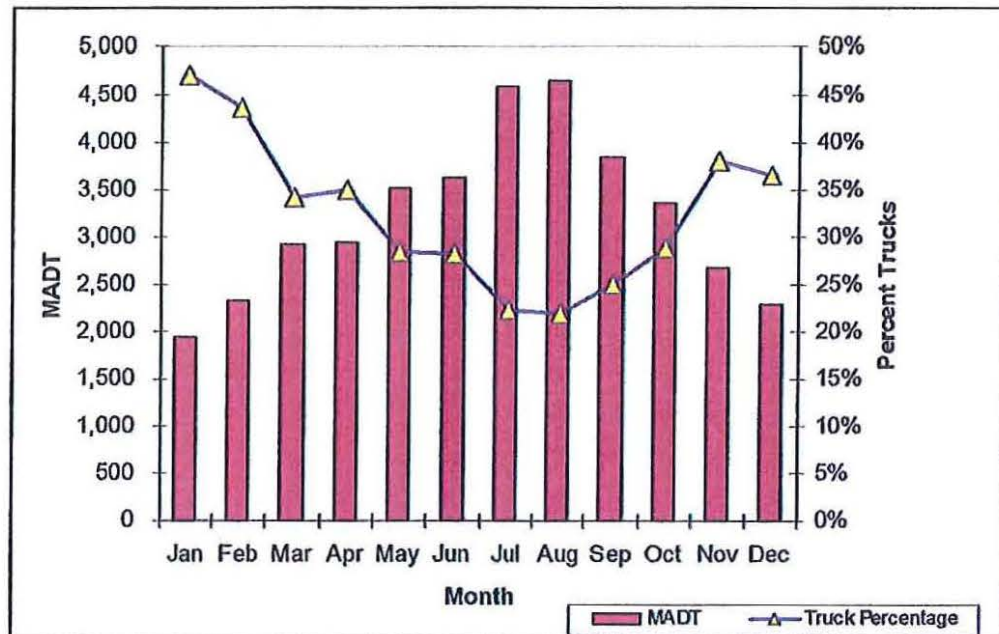
Year	AADT	SADT	SADT/AADT
1996	3944	5964	1.51
1997	3821	5752	1.51
1998	3932	5624	1.43
1999	3931	5659	1.44
2000	3690	5329	1.44
2001	3477	5097	1.47
2002	3450	5082	1.47
2003	3372	5002	1.48
2004	3409	4977	1.46
2005	3225	4626	1.43

The SADT/AADT ratios have remained in the range of 1.4 to 1.5. This indicates a very high influence of tourism travel during the summer months.

2.2 Current Use

Figure 2.2 shows the monthly average daily traffic at China Bar for 2005. The figure also shows the proportion of truck traffic (vehicles over 12.5m in length) on a monthly basis.

Figure 2.2: Monthly Traffic Patterns, Station P-27-1 (China Bar), 2005












As demonstrated previously, the summer volumes are considerably higher than the rest of the year. This is not true of truck traffic, which remains generally constant through the year. With the exception of December and January when truck volumes are lower, the monthly average truck traffic at China Bar is within 5% of the annual average daily truck traffic.

This means that the truck traffic as a proportion of total daily traffic varies considerably as illustrated in Figure 2.2 above

A manual 24-hour classification count was undertaken in August 2006 at the junctions of Highway 8/1 (Spences Bridge) and Highway 12/1 (Lytton). The total volumes at each location, summarized by vehicle class are shown in Table 2.2.

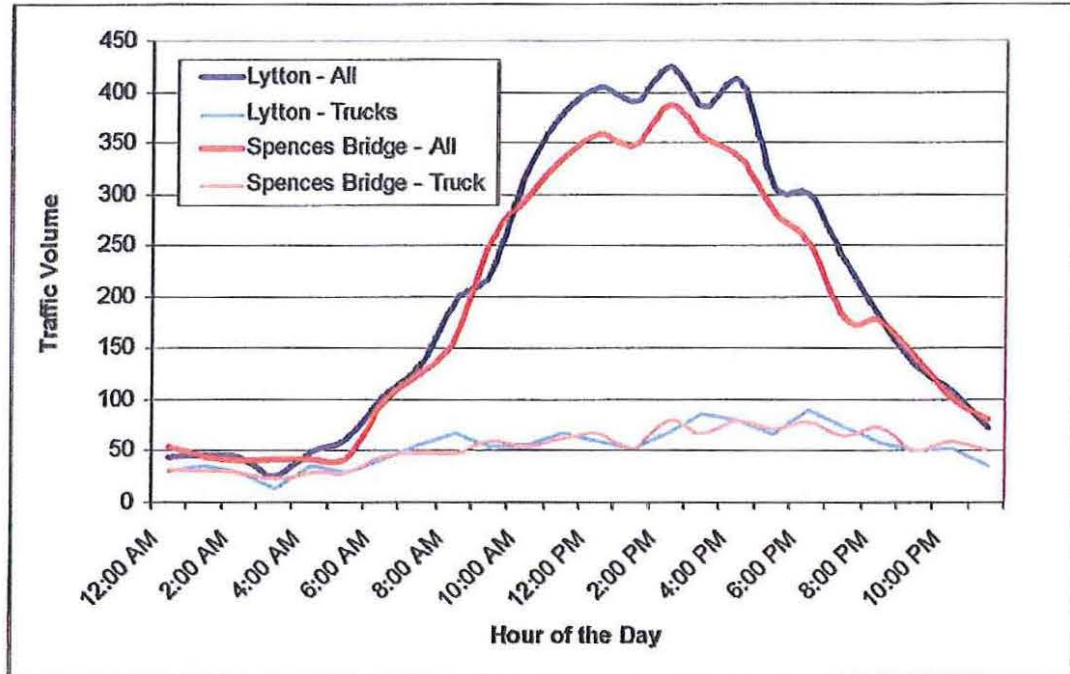
Table 2.2: 24-Hour Classification Count Summary (August 2006)

Classification	Lytton			Spences Bridge		
	NB	SB	Total	NB	SB	Total
Motorcycles 	24	21	45	24	24	48
Cars, Vans, Pickups  	1116	1138	2254	1270	1384	2654
Buses 	3	3	6	6	5	11
Single Unit Trucks 	31	20	51	39	31	70
Single Trailer Truck 	180	178	358	231	216	447
Multi-Trailer Truck 	168	138	306	146	168	314
Logging Trucks 	19	105	124	23	169	192
Empty Logging 	21	14	35	117	28	145
RV	30	49	79	50	72	122
Total	1592	1666	3258	1906	2097	4003

The truck percentages at Lytton and Spences Bridge were 25.8% and 29.3% respectively over the 24-hour period. Based on discussions with Ministry staff and the RCMP, trucks carrying finished lumber account for a high proportion of truck-involved collisions and are a growing component of the total truck volume on the highway. Loaded lumber trucks accounted for approximately 14% of the trucks at Lytton, or 4% of the total traffic during the 24-hour count period.

Figure 2.3 shows the distribution of traffic through the day for the counts conducted at Lytton and Spences Bridge. Truck traffic is distributed relatively evenly throughout the day in contrast to total traffic that peaks in midday, which is typical of a rural traffic distribution.

Figure 2.3: Daily Traffic Distribution (August 2006)



2.3 Future Use

Traffic volumes in future years will be affected by economic development in the north of the Province. As the economy of the Interior continues to strengthen and diversify, traffic volumes along the Trans-Canada Highway and Highway 97 northern corridor will likely increase. In particular, prospects for growth in the short and medium term are strong.

In the short-term, beetle harvesting over the next decade is expected to vastly increase the number of logging trucks, lumber trucks and heavy equipment moving along the Highway 97 corridor, with an expected spillover onto the TCH section between Hope and Cache Creek. Further increases in mining exploration may lead to the development of several new mines in the Interior which would likewise generate increased economic activity.

Medium-term prospects include new activity and interest surrounding the Olympics and the potential use of Highway 99 as an alternate route for tourist traffic. It can be expected that recreational traffic volumes before, during and after the Games on the corridor will increase, and may be sustainable in the long-term as a growing tourism route.

Long-term prospects for growth will depend on the economic vitality of the Central and Northern Interior communities and their ability to diversify their economies and make the transition to a post-beetle wood industry. Future in mineral exploration are likewise difficult to project into the long-term as much depends on global commodities pricing.

CORRIDOR SAFETY PERFORMANCE ASSESSMENT

In this initial phase of the safety assessment, the performance is focussed on general characteristics along the entire corridor. Table 3.1 provides a summary of the historical collisions by LKI Segment.

Table 3.1: Collision History by LKI Segment (2001-2005)

LKI Segment	2006 AADT Estimate	Collision Frequency		Collision Rates		Proportion High Severity (Fatal + Injury)	
		All Vehicles	Truck Involved	All Vehicles	Truck Involved	All Vehicles	Truck Involved
905	4442	385	178	0.45	0.69	52%	51%
910	3498	117	46	0.51	0.66	48%	54%
915	3554	144	45	0.48	0.50	47%	42%
917	4323	42	17	1.10	1.49	40%	24%
Total	4108	688	286	0.48	0.67	50%	48%

As Table 3.1 shows, the collision rate for truck-involved collisions is higher than the all-vehicles rate on all segments, with Segment 905 having the greatest difference. On Segment 905, the collision rate for truck-involved collisions is more than 50% higher than the overall collision rate.

2.4 Collision Frequency

Figures 3.1, 3.2 and 3.3 show the collision frequencies for all vehicles on LKI Segments 905, 910 and 915 / 917 respectively, for the years 2001 to 2005. When divided into 1.0 km segments, the following are the top 9 highest frequency locations on the corridor:

- approximately 4 km north of the Thompson River Bridge at Spences Bridge (5.8 collisions/yr);
- Tank Hill, approximately 13 km north of Lytton (5 collisions / yr);
- Yale, approximately 24 km north of Hope (4.2 collisions / yr);
- north of the CPR access road, approximately 9 km north of Hope (4.2 collisions / yr);
- vicinity of Bell Crossing, approximately 27 km north of Hope (4.0 collisions / yr);
- vicinity of Emory Creek Bridge, approximately 16 km north of Hope (3.8 collisions / yr);
- north of Highway 7 junction, north of Hope (3.6 collisions / yr);
- south approach to the Fraser River Bridge, Hope (3.6 collisions / yr); and
- south end of Tank Hill, 10 km north of Highway 12 (3.6 collisions / yr).

Figure 3.1: Collision Frequency, Segment 905 (2001-2005)

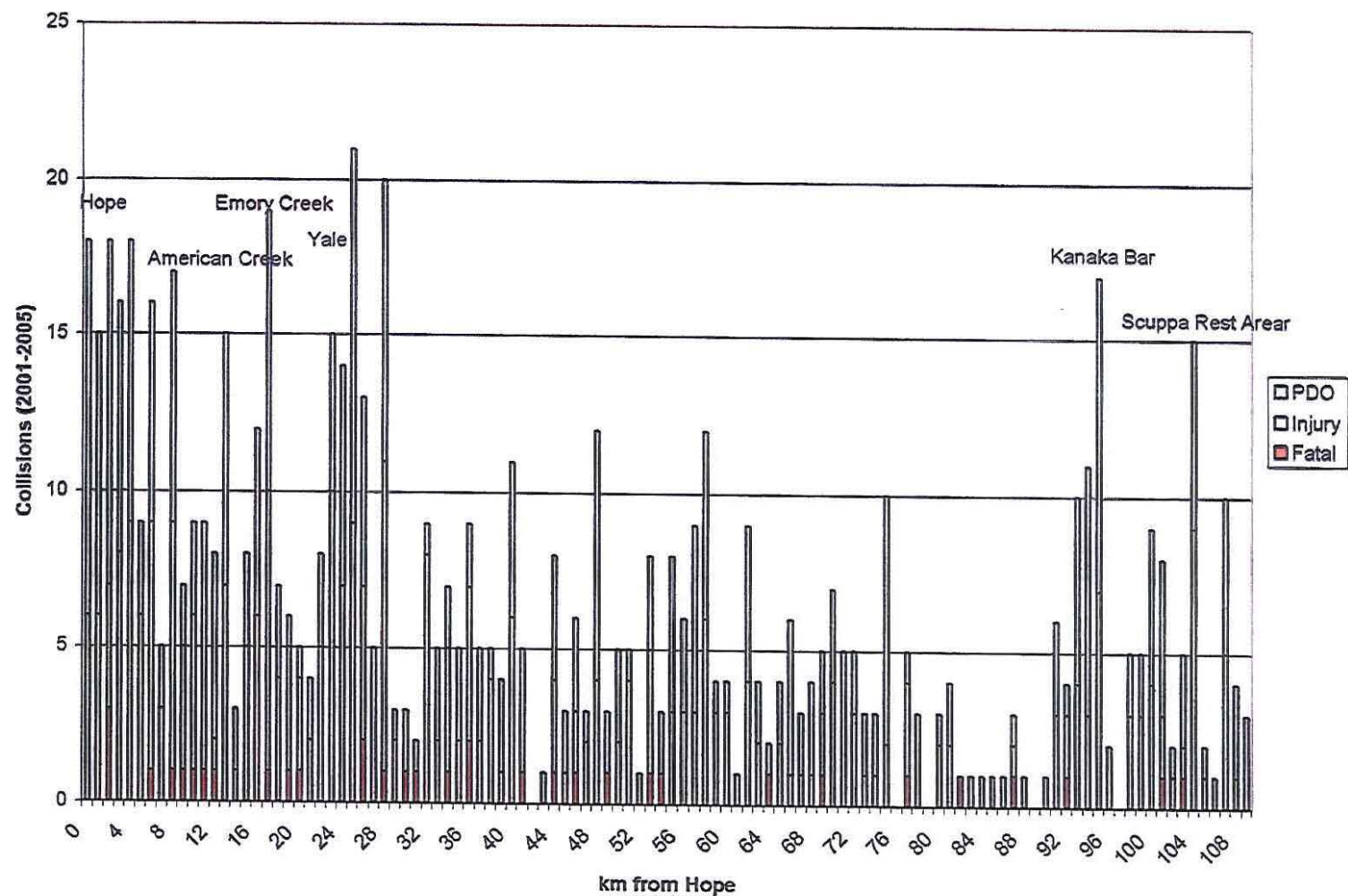


Figure 3.2: Collision Frequency, Segment 910 (2001-2005)

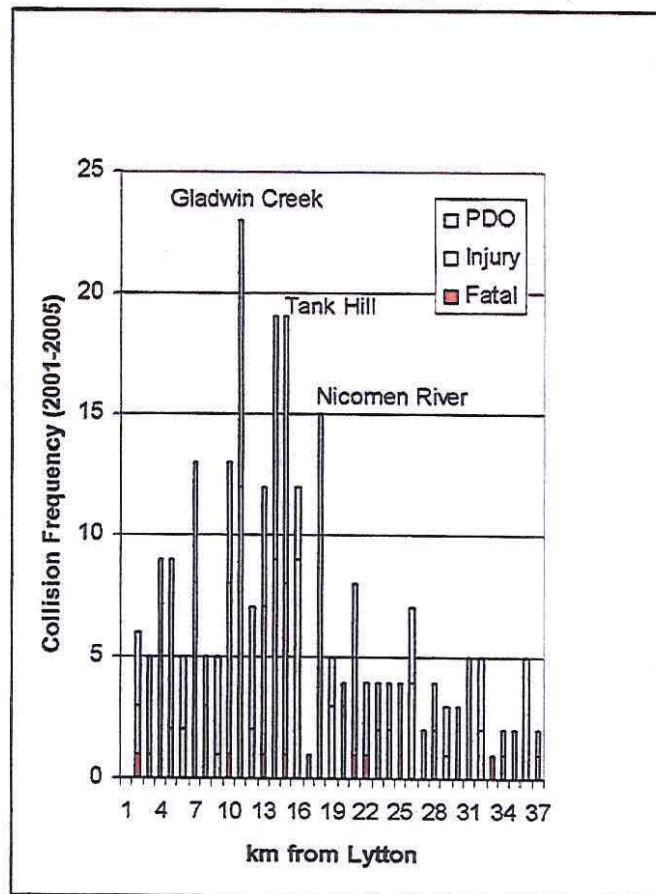
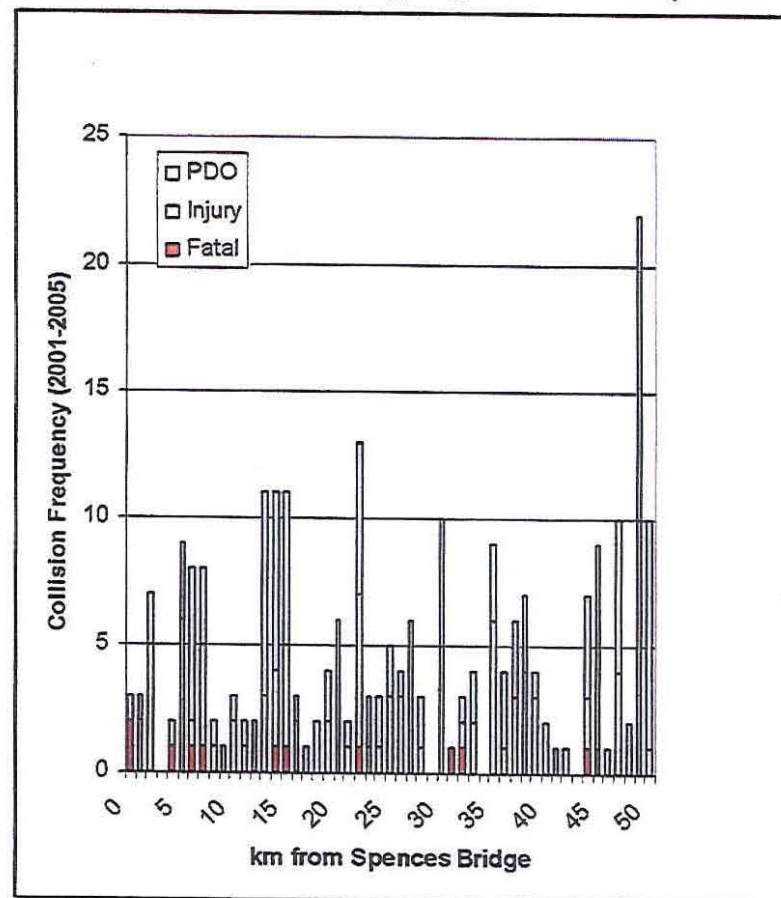


Figure 3.3: Collision Frequency, Segments 915/917 (2001-2005)



2.5 Collision Rate

Table 3.2 provides a comparison of all vehicle, truck and critical rates for the entire corridor.

Table 3.2: Collision Rates – Highway 1, Hope to Cache Creek (2001-2005)

	Fatal	Injury	PDO	Total
Collision Rate				
All Vehicles	0.027	0.221	0.248	0.50
Truck Involved	0.035	0.263	0.298	0.62
Provincial Average				
All Vehicles	0.01	0.21	0.22	0.44
Critical Rate				
All Vehicles	0.015	0.23	0.241	0.47
Ratio of Observed to Critical				
All Vehicles	1.80	0.96	1.03	1.06

As this table shows, the overall collision rate is above the critical rate for all collisions, indicating that this section of highway has an observed rate that is statistically higher than the provincial average, although the observed rate is only 6.4% above the critical rate. Truck-involved provincial averages are not available, therefore critical rates cannot be calculated.

Table 3.3 summarizes the collision rates on Highway 1 between Hope and Cache Creek, compared with the Highway 5 and 3 corridors.

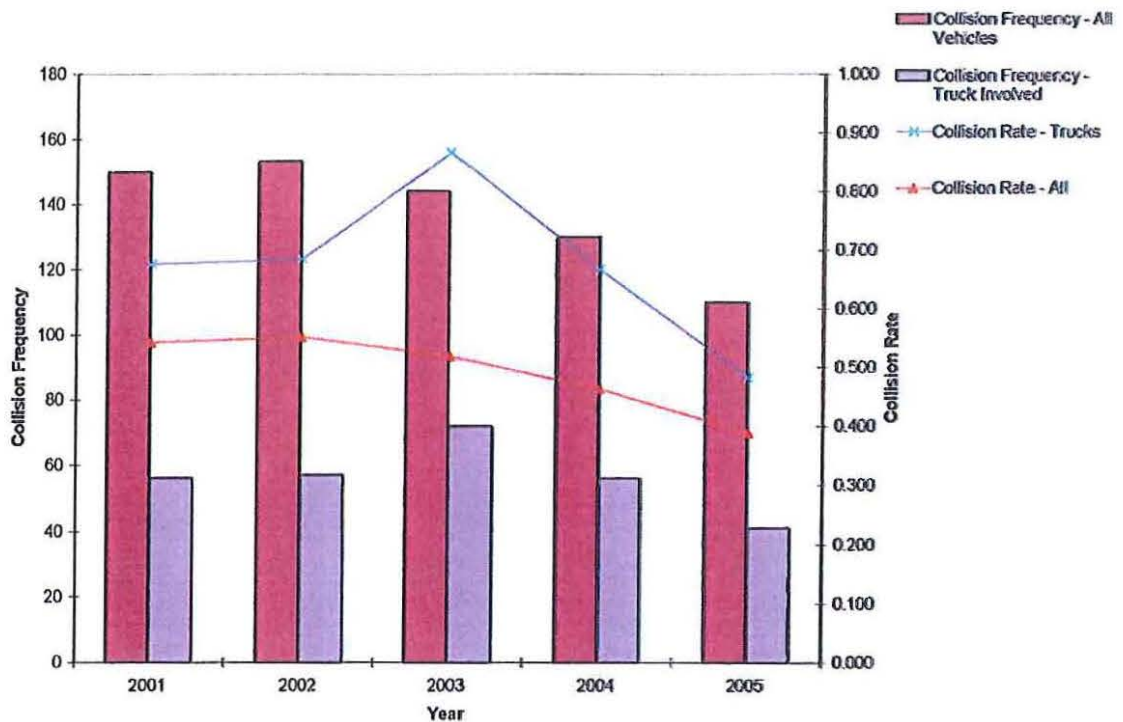
Table 3.3: Collision Rates Collision Rate Comparison, Highways 1, 3, 5

Highway	Truck Involved Collision Rate (Collisions / MVK)	All Vehicles Collision Rate (Collisions / MVK)
Highway 1 Hope to Spences Bridge	0.65	0.45
Highway 1 Spences Bridge to Cache Creek	0.55	0.58
Highway 5 Hope to Merritt	0.60	0.74
Highway 5 Merritt to Kamloops	0.33	0.56
Highway 3 Hope to Princeton	1.49	1.06

As the table shows, the collision rates for Highway 1 and Highway 5 are comparable, for trucks and all vehicles, and are considerably better than Highway 3. The information presented in Tables 3.2 and 3.3 suggests that the Highway 1 corridor has a collision history that is slightly worse than the provincial average, but when compared with the other mountain corridors in the area, the demonstrated safety performance is comparable or better.

Figure 3.4 shows the historical collision trends from 2001 to 2005. As the figure shows, the collision rate and frequency have been declining for all collisions and those involving trucks. The exception is 2003 when the truck rate increased dramatically. There is no apparent cause for this one-year increase and the subsequent years have returned to the previous trend.

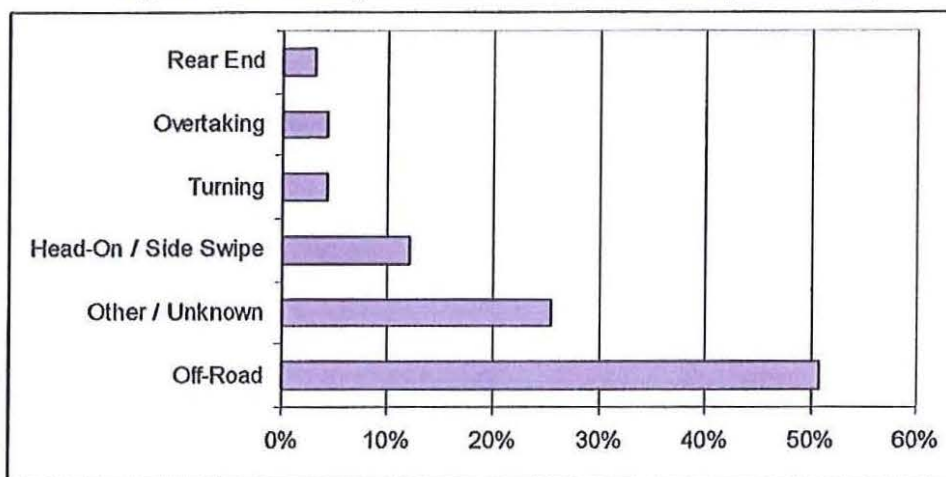
Figure 3.4: Collision Trends, 2001-2005



2.6 Causal Factors

Figure 3.5 illustrates the proportion of collisions by primary occurrence. Off-road right and left account for over 50% of the collisions. This is reflective of the large number of advisory speed zones as drivers may tend to "overdrive" these advisory zones. It is interesting to note however that head-on and side-swipe do not represent an unusually high proportion of the collisions. These types are often associated with corridors that have tight curves and would be expected to be higher. The proportion of collisions associated with intersections and turning is quite low.

Figure 3.5: Primary Occurrence – All Vehicles (2001-2005)

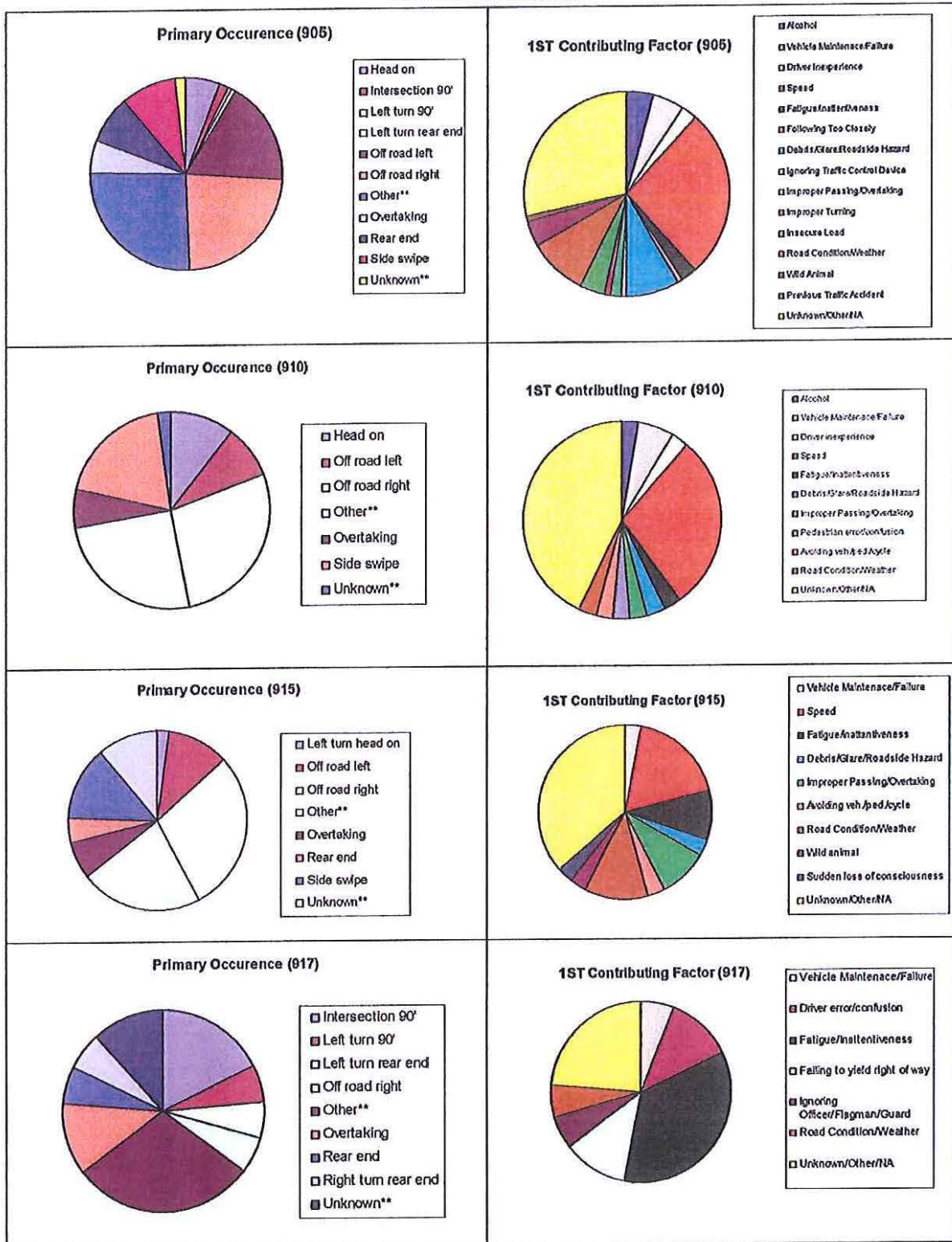


Unsafe speed and driving without due care clearly stand out as the most common first contributing factors, each accounting for just under 15% of the total collisions on the corridor. *Alcohol Involvement* is the third most commonly reported first contributing factor (approximately 6%).

Figure 3.6 provides a summary of the primary occurrence and first contributing factor by LKI segment for truck-involved collisions. As expected, off-road left/right represent the highest primary occurrence for Segments 905, 910 and 915. Off road collisions are much lower on Segment 917 given the urban nature of the segment. Head-on and side swipe collisions are higher on Segment 910 than on the other segments, representing 30% of all collisions. Side swipe is reported as the primary occurrence for collisions on Segment 915. Head-on and side swipe collisions are reflective of the mountainous nature of the highway and the high number of speed advisory zones due to curves with low design speeds. The proportions for truck-collisions is comparable with the proportions for all vehicles.

Through much of the corridor, speed is reported as the most frequent first contributing factor, and is reported as such considerably more often than any other factor. Most other first contributing factors account for less than 10% of the collisions on a given segment. The exception is Segment 917 through Cache Creek where the fatigue / inattentiveness, driver confusion and failing to yield the right-of-way are reported as first contributing factors in over 50% of the collisions. This is reflective of the more urban nature on this section.

Figure 3.6: First Contributing Factor and Primary Occurrence, Truck Involved Collisions



3 COLLISION PRONE SECTIONS

Three methods were used to identify collision-prone sections:

- Ministry of Transportation assessment based on rate/severity plus frequency
- evaluation of rate over 5 km sections; and
- identified by stakeholders.

The MoT method requires that the following two criteria be met:

- observed rate is greater than the critical rate OR the severity ratio is greater than 8.0; AND
- the collision frequency for 2001 to 2005 is greater is 15 or more (3 per year or more).

On this basis, two collision prone sections and one collision prone location were identified.

The use of collision rates over a 5 km section compares identifies those sections that have highest collision rates relative to the rest of the corridor. In this case, collision rates were calculated for 5 km sections, moving in 1 km increments. The historical collision rate was compared with a critical rate that was based on the overall corridor rate, rather than the provincial average as is typically the case for determining the critical rate. Where a 5 km section had a collision rate greater than the corridor critical rate, the section was investigated in greater detail to determine the specific length that was collision-prone.

The third set of collision-prone sections / locations were identified based on stakeholder input.

Table 4.1 presents the full list of collision prone sections.

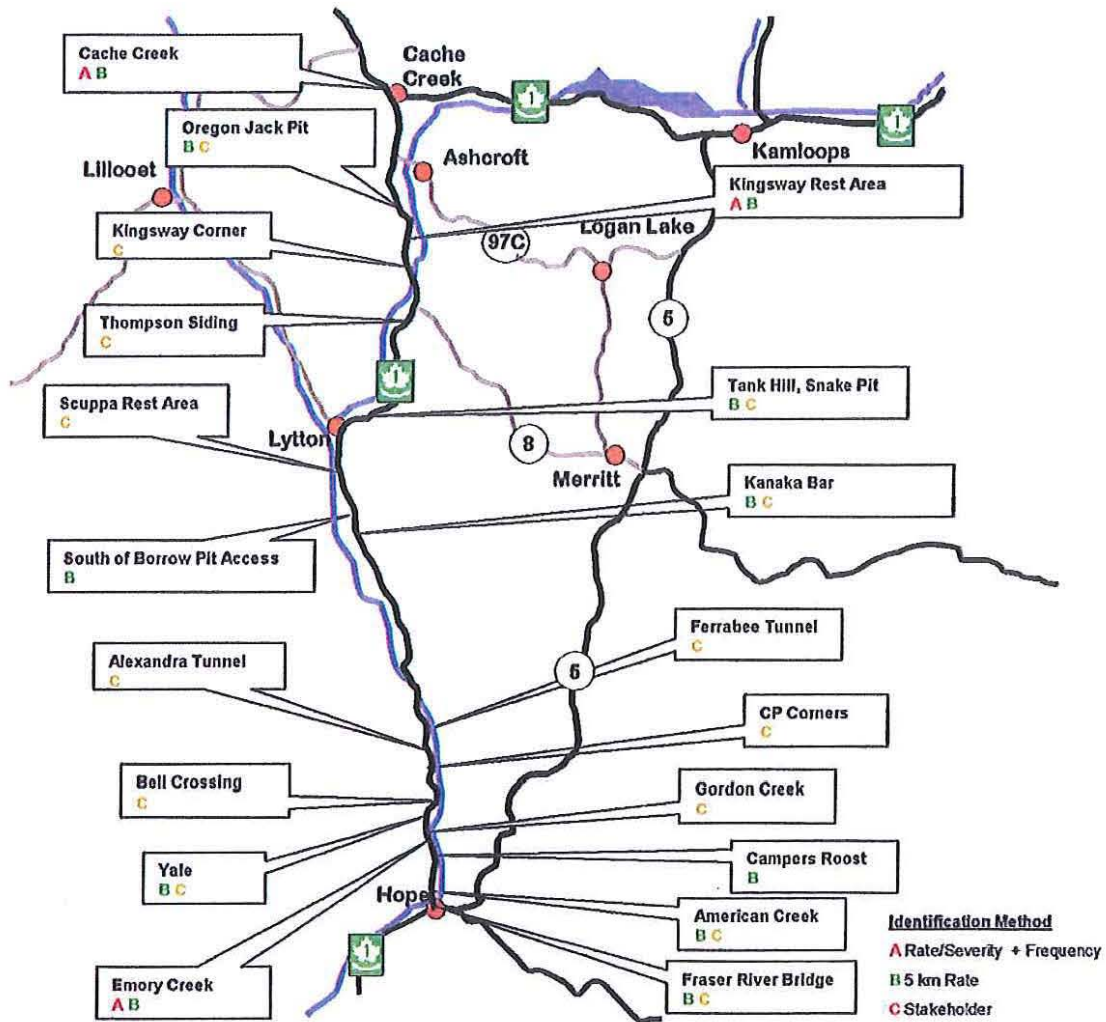
Table 4.1: Collision Prone Sections

LKI Seg	LKI Offset	Location	Rate / Frequency	5 km Rate	Stakeholder
905	1.6	Fraser Bridge			X
	3.1 - 8.2	Starts 1.5km north of Haig Station Road, American Creek Bridge (8.1)		X	
	11.4 - 13.3	Camper's Roost		X	
	15.8 - 17.4	Emory Creek Bridge	X	X	
	21.6 - 22.1	Gordon Creek			X
	24.0 - 25.5	Downtown Yale			X
	25.5 - 26.9	Bell Crossing (25.5-25.8)			X
	31.0 - 32.1	CP Corners			X
	47.5 - 49.0	Alexandra Tunnel (47.7-48.0), Pullout Area (49.0)			X

	52.7 - 53.6	Ferrabee Tunnel, Ferrabee Retaining Wall			
	93.0 - 95.2	Kanaka Bar		X	X
	100.2 - 100.6	1.9 km south of Borrow Pit for Riprap		X	
	102.9 - 103.5	Skuppa Rest Area, south of Skihist Park			X
910	13.0 - 17.5	Tank Hill (13-13.4), Snake Pit (13.5-15), Nicomen Creek (17-17.5)		X	X
	22.2 - 23.0	Thompson Siding		X	X
915	3.8 - 5.6	Kingsway Corner			X
	12.6 - 14.5	Rest Area, start of Kingsway 4-Lane (12.8)	X	X	
	21.3 - 22.2	Oregon Jack Pit		X	X
917	3.7 - 4.6	Cache Creek	X	X	

These locations are identified on Figure 4.1

Figure 4.1: Collision Prone Locations



4 WARNING SIGNAGE REVIEW

At the outset of this study, inconsistencies in the application of warning signage were identified as a potential contributor to the high collision rate on the study corridor. This section provides a summary of the existing signage on the route and a comparison against the Ministry's signage warrants.

4.1 Ministry of Transportation Signage Warrants

Ministry of Transportation warning signage warrants are provided in the Manual of Standard Traffic Signs and Pavements Markings. For the Fraser Canyon, most of the speed advisory zones are indicated in the form of curve warning signs. These curve and alignment signs are used to warn drivers of conditions where the prevailing posted speed is higher than the geometric conditions can support at a specific location. The advisory speed is determined by assessing the safe speed at which the roadway can be travelled based on horizontal and vertical alignments. Figure 5.1 below illustrates the levels of warning signs used.

Figure 5.1 : Ministry of Transportation Warning Signage



Curve warning signage is used to warn the driver of the severity and direction of the change in the road's alignment. There are five levels of warning signs that are applied based on the severity and type of curve. The general criteria for each level of warning signage are as follows:

- Level 1 - required where the advisory speed is 10 km/h lower than the posted speed;
- Level 2 - used in conjunction with a Level 1 sign, when the advisory speed is 20 km/h lower than the current posted speed. Level 2 signs are installed directly below and on the same post as the Level 1 curve & alignment warning signs;
- Level 3 - placed prior to the curve warning sign where the advisory speed for the alignment is 30 km/h lower than the current posted speed. This sign should not be used independently to warn of a potential hazard, and if overused, can lose its effectiveness in identifying potential dangerous segments of the roadway;
- Level 4 - used where there is a documented history of the section being accident prone. Level 4 signage should be used in place of a Level 3 slow sign, with the advisory speed displayed in the centre.
- Level 5 (overhead) - used if the two or more of the following criteria are met:
- the recommended safe speed is 20 km/h below the posted speed limit;
 - the location is listed as an "Accident Prone Location"; or
 - additional emphasis of the sign is required due to visual clutter.
- Level 6 (illuminated overhead) - should be used in place of a Level 5 sign, unless:
- no power source is available to illuminate the sign; or
 - sufficient ambient light is available.
- Level 7 (simultaneous flashers overhead) - used where the advisory speed is 50 km/h or more below the posted speed or at locations where the accident frequency is high.

5.2 Existing Signage Inventory

A current signage inventory was conducted in July 2006, and is provided in Appendix B.

5.3 Warning Signage Deficiencies

Tables 5.1 and 5.2 show possible signage deficiencies when compared with the Ministry's Manual of Standard Traffic Signs and Pavement Markings. Deficiencies have been defined as locations where insufficient signage is applied, or where the level of signage is higher than warranted, as over-signage can also contribute to safety problems.

Table 5.1 – Northbound Signage – Potential Deficiencies

Segment	LKI	Deficiency	Potential Solution
905	22.7	Starburst warning not warranted	Drop to Level 2
905	32.36	No Level 3 signage prior to curve warning - advisory speed is 30km/h lower than posted speed	Install Level 3 signage prior to curve warning signage
905	94.72	Advisory speed tab (70km/h) not required; posted speed (80 km/h)	Remove advisory speed tab
905	101.48	Slow sign located too far away from curve advisory signage	Relocate slow sign closer to the beginning of curve
905	102.66 & 103.1	Not accident prone; Level 7 signage not warranted; visibility may be impaired	Drop to Level 3
910	7.6	No apparent hazard to justify slow sign	Remove slow sign
910	11.3	No Level 3 signage prior to curve warning - advisory speed is 40km/h lower than posted speed	Level 3 signage prior to curve warning signage
910	12.88	No Level 3 signage prior to curve warning - advisory speed is 30km/h lower than posted speed	Level 3 signage prior to curve warning signage
910	13.24	Slow sign not followed by curve warning or advisory speed	Review alignment to determine design standard and required advisory speed
910	15.78	No Level 3 signage prior to curve warning - advisory speed is 40km/h lower than posted speed	Level 3 signage prior to curve warning signage
910	16.55	Slow sign located too far away from curve advisory signage	Relocate slow sign closer to the beginning of curve
910	18.59	No Level 3 signage prior to curve warning - advisory speed is 50km/h lower than posted speed	Level 3 signage prior to curve warning signage



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TABLE 5.2 – SOUTHBOUND WARNING SIGNAGE – POTENTIAL DEFICIENCIES

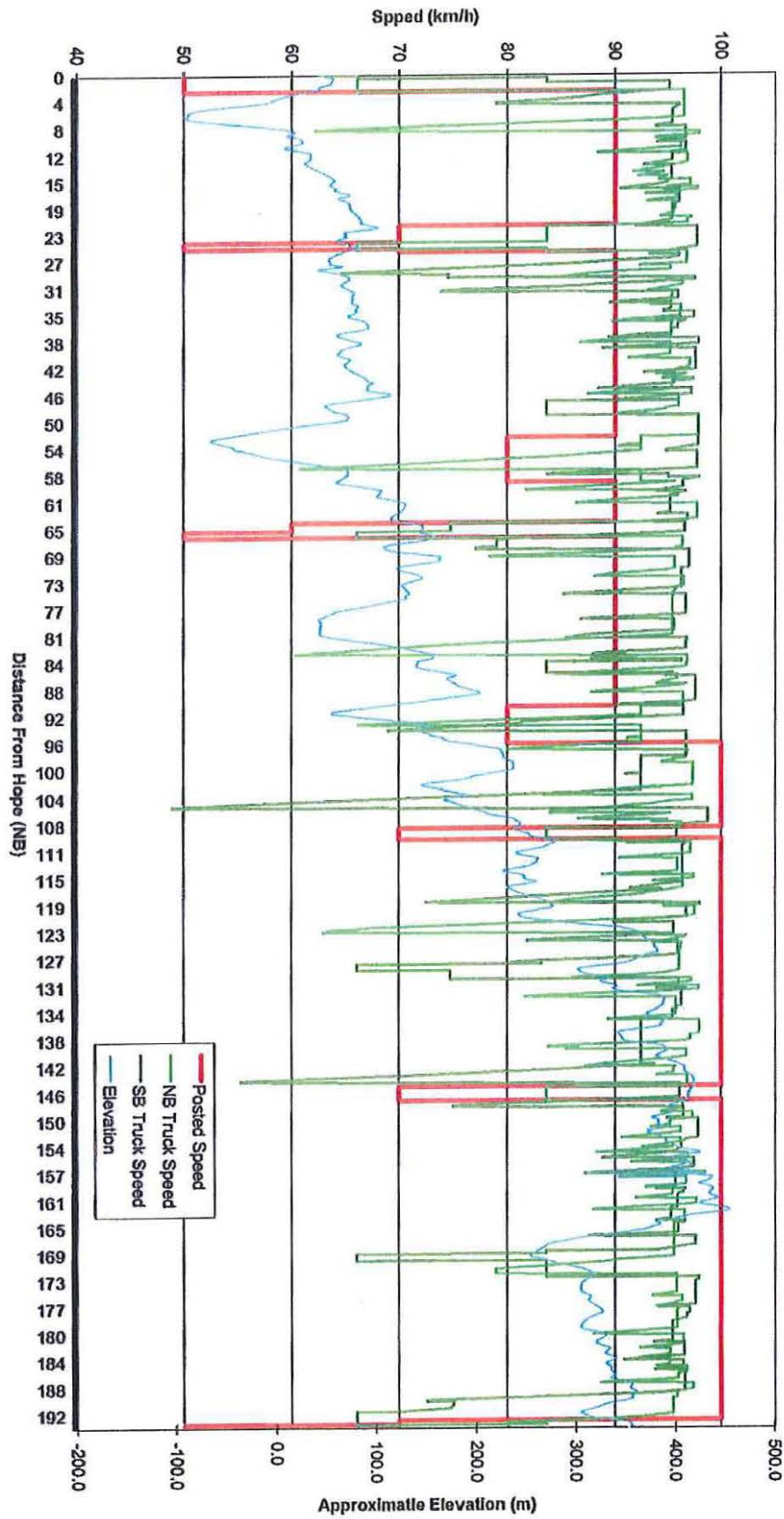
Segment	LKI	Deficiency	Potential Solution
910	17.06	Level 3 sign installed in conjunction with Level 4 Sign	Remove Level 3 sign
910	11.56	No Level 3 signage prior to curve warning - advisory speed is 30 km/h lower than posted speed	Install Level 3 signage prior to curve warning signage
905	107.3	Not accident prone; Level 7 signage not warranted; visibility may be impaired	Drop to Level 3
905	104.95	No Level 3 signage prior to curve warning - advisory speed is 30 km/h lower than posted speed	Install Level 3 signage prior to curve warning signage
905	104.26	Not accident prone; Level 7 signage not warranted; visibility may be impaired	Drop to Level 3
905	95.11	Advisory speed tab (70km/h) not required; posted speed (80 km/h)	Remove advisory speed tab
905	34.4	No Level 3 signage prior to curve warning - advisory speed is 40 km/h lower than posted speed	Drop to Level 3
905	23.37	Level 2 & 4 signage not required	Drop to Level 1

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Appendix A

Profile and Truck Climbing Speeds

Existing Truck Travel Conditions



Appendix B

Signage Inventory

SEGMENT	OFFSET	SIGN DESCRIPTION
917	3.94	50 km/h
917	3.35	70 km/h
917	3.29	Slower Traffic Keep Right
917	2.78	100 km/h
917	2.78	Intersection Warning, Heavy Trucks, Keep to left of barrier (right side), either side of barrier (middle)
917	0.78	Hospital/Police
917	0.18	Keep to either side of barrier (right side)
915	43.53	100 km/h
915	43.02	Lane Ends 200m
915	42.82	Lane Ends
915	38.82	Do Not Pass When Lights Flashing (School Bus)
915	38.02	Strong Crosswinds - 3km
915	33.34	Fraser Canyon Highway Safety Corridor Begins
915	28.92	Rest Area 400m
915	28.57	Rest Area
915	25.04	Logging Trucks
915	24.42	100 km/h
915	24.23	Do Not Pass
915	22.32	Grade Warning (7%) - Trucks Gear Down
915	21.65	100 km/h
915	21.41	Do Not Pass
915	20.22	Keep to left of barrier (right side)
915	19.17	Grade Warning (7%)
915	18.77	Falling Rocks
915	17.26	Falling Rocks (1 km)
915	17.2	Slow
915	17.13	Curve Warning (70 km/h)
915	15.02	Slower Traffic Keep Right
915	14.77	Curve Warning
915	14.15	Slow
915	14.15	Do Not Pass When Lights Flashing (School Bus)
915	13.98	Trucks - Curve Warning (70 km/h)
915	13.75	Keep to left of barrier (right side)
915	13.45	Lane Ends 200m
915	13.05	6 curve chevrons on left curve, Keep to left of barrier (right side)
915	13	Falling Rocks
915	12.75	Slow
915	12.65	Curve Warning (60km/h)
915	9.17	Left Curve Warning
915	6.39	Keep to left of barrier (right side)
915	6.16	Do Not Pass
915	5.9	Left Curve Warning
915	5.45	Caution - Big Horn Sheep Crossing - 4km
915	4.07	Watch for Sheep
915	4.03	Right Curve Warning
915	2.34	70 km/h ahead
915	1.93	Variable Message Sign
910	35.41	Highway Gate
910	35.27	100 km/h
910	35.06	Left Curve Warning (also, reflectors on curve)

910	34.28	Left Curve Warning
910	34.16	Passing Lane Ahead
910	33.88	Reflectors on curve
910	33.84	Right Curve Warning
910	33.51	Keep to left of barrier (right side)
910	33.16	Keep to left of barrier (right side) (2)
910	32.76	Curve Warning
910	32.66	Passing Lane
910	32.56	Left Curve Warning
910	32.21	Keep to left of barrier (right side)
910	31.91	Keep to left of barrier (right side), Keep to right of barrier (left side)
910	31.44	Heavy Trucks
910	31.42	Keep to left of barrier (right side)
910	31.2	Left Curve Warning (80km/h)
910	30.92	70 km/h ahead
910	30.88	Keep to left of barrier (right side)
910	30.76	70 km/h
910	30.6	Slippery Road
910	30.59	50 km/h ahead
910	30.5	50 km/h
910	30.38	Lane Ends 200m
910	30.18	Lane Ends
910	30.14	Keep to left of barrier (right side), Keep to right of barrier (left side)
910	29.21	Bumpy Road
910	28.93	100 km/h
910	28.66	Slippery Road, Bumpy Road
910	28.56	Keep to left of barrier (right side)
910	28.34	Left Curve Warning
910	27.46	Keep to left of barrier (right side)
910	26.81	Keep to right of barrier (left side)
910	26.76	Keep to left of barrier (right side)
910	26.73	Left Curve Warning
910	26.31	Keep to either side of barrier (right side)
910	25.83	Keep to left of barrier (right side)
910	25.83	Curve Warning (80km/h)
910	25.62	100 km/h
910	25.56	Keep to right of barrier (left side)
910	25.41	Passing Lane in 2km
910	24.96	Keep to left of barrier (right side)
910	24.28	Right Curve Warning
910	23.36	Passing Lane Begins
910	23.26	Lane Ends 200m, Curve Warning (80km/h)
910	23.16	Lane Ends
910	23.06	Heavy Trucks
910	23.01	Slower Traffic Keep Right
910	22.91	Keep to left of barrier (right side)
910	22.66	Keep to left of barrier (right side)
910	21.68	Keep to left of barrier (right side)
910	21.26	Logging Trucks, Right Curve Warning
910	21.11	Keep to left of barrier (right side)
910	20.96	Lane Ends
910	20.91	Curve Warning (80km/h)

910	20.76	Keep to left of barrier (right side)
910	20.71	Grade Warning (7%)
910	20.66	Truck Tipping
910	20.56	Curve Warning (60km/h)
910	20.46	Slow
910	20.36	Curve Warning (60km/h)
910	20.16	Lane Ends 200m
910	20.13	Keep to left of barrier (right side)
910	20.06	5 curve chevrons (left curve)
910	19.66	Keep to left of barrier (right side)
910	19.26	Right Curve Warning
910	19.23	Keep to right of barrier (left side)
910	18.76	overhead flashing 50 km/h alignment warning
910	18.66	Intersection Warning, Slippery Road, 4 right curve indicators
910	18.56	Keep to left of barrier (right side), Keep to right of barrier (left side)
910	18.36	Left Curve Warning (80km/h)
910	18.16	Right Curve Warning (70km/h)
910	17.83	Right Curve Warning
910	17.46	Passing Lane 2km
910	17.06	Slow
910	17.03	Starburst Sign (40km/h)
910	16.95	Slippery Roads, Lane narrows
910	16.86	Curve Warning (40km/h)
910	16.58	Checkered Right Curve Warning
910	15.88	Falling Rocks
910	15.86	Checkered Left Curve Warning
910	15.84	Keep to left of barrier (right side), Keep to right of barrier (left side)
910	15.46	Keep to left of barrier (right side)
910	15.16	Falling Rocks
910	15.06	Slow
910	14.96	Lane Ends 200m
910	14.81	Curve Warning for 2km (50km/h)
910	14.76	Lane Ends
910	14.56	Slippery
910	14.13	Falling Rocks (2km)
910	13.96	Starburst Sign (50km/h)
910	13.86	5 left curve chevrons
910	13.66	Curve warning (60km/h)
910	13.56	Trucks Turning, 4 left curve indicators
910	13.3	Slower Traffic Keep Right
910	13.26	Tiny red slow sign
910	12.96	Curve Warning (80km/h)
910	12.86	Keep to left of barrier (right side)
910	12.31	Right Curve Warning
910	12.24	Keep to left of barrier (right side)
910	11.86	Elk Warning (5km)
910	11.68	Do Not Pass When Lights Flashing (School Bus)
910	11.56	50 km/h (curve)
910	10.36	Keep to left of barrier (right side)
910	10.35	Curve Warning (80km/h)
910	9	100 km/h
910	8.86	Keep to left of barrier (right side)

910	8.66	Intersection (hidden road)
910	8.26	Slow
910	8.23	Right Curve Warning (70km/h)
910	8.14	Slippery Road
910	8.12	Keep to left of barrier (right side)
910	7.96	7 left curve chevrons
910	7.26	Lane Ends 200m
910	7.11	Falling Rocks
910	7.06	Lane Ends
910	6.88	Slower Traffic Keep Right
910	6.66	Keep to left of barrier (right side)
910	6.64	Elk Warning (5km)
910	5.72	Keep to either side of barrier (right side)
910	5.62	Keep to left of barrier (right side)
910	5.03	Keep to left of barrier (right side)
910	4.96	Left Curve Warning, Keep to left of barrier (right side)
910	3.88	Keep to left of barrier (right side)
910	3.86	Lane Ends Ahead
910	3.76	Lane Ends
910	3.56	Keep to left of barrier (right side)
910	3.18	Left Curve Warning
910	3.16	Keep to left of barrier (right side)
910	3.06	Intersection Warning
910	3.06	Pedestrian Crossing
910	2.92	Slower Traffic Keep Right
910	2.76	Keep to left to barrier (right side)
910	2.61	Left Curve Warning
910	2.41	Deer Crossing
910	2.11	Report Aggressive Drivers Sign
910	1.86	Curve Warning (80km/h)
910	1.76	Heavy Trucks
910	1.46	Left Curve Warning
910	1.16	Keep to left of barrier (right side)
910	1.02	70 km/h ahead
910	0.86	70 km/h
910	0.36	Keep to left of barrier (right side)
910	0.21	Keep to left of barrier (right side)
910	0.06	Pedestrian Crossing
905	108.42	70 km/h
905	108.2	Keep to left of barrier (right side)
905	108.16	Do Not Pass When Lights Flashing (School Bus)
905	107.97	Curve Warning
905	107.9	100 km/h
905	107.85	Lane Ends 200m
905	107.65	Lane Ends
905	107.3	Overhead Curve Warning (60km/h)
905	107.2	Slippery Road
905	107	Left Curve Warning (70km/h)
905	106.9	4 left curve chevrons
905	106.8	3 right curve chevrons
905	106.5	Curve Warning
905	106.1	Right Curve Warning

905	106	Elk Warning
905	105.9	Keep to left of barrier (right side)
905	105.78	Slower Traffic Keep Right
905	105.75	Keep to left of barrier (right side)
905	105.3	Lane Ends
905	105.1	Falling Rocks
905	104.95	Left Curve Warning (70km/h)
905	104.8	Keep to left of barrier (right side)
905	104.26	overhead flashing truck 60 km/h alignment warning
905	104.23	Slower Traffic Keep Right
905	104.2	Keep to left of barrier (right side)
905	103.8	60 km/h (curve)
905	103.7	No Left Turn
905	103.55	Keep to left of barrier (right side)
905	103.1	Falling Rocks
905	103.05	No Left Turn
905	103	Keep to left of barrier (right side)
905	102.88	Left Curve Warning (80km/h)
905	102.65	Keep to left of barrier (right side)
905	102.46	Slower Traffic Keep Right
905	101.82	Elk Warning (5km)
905	101.63	Do Not Pass
905	100.8	Left Curve Warning
905	100.65	Keep to left of barrier (right side)
905	100.6	Deer Crossing, Rocks Falling
905	100.4	Left Curve Warning
905	99.32	Do Not Pass When Lights Flashing (School Bus)
905	99.13	80 km/h ahead
905	98.84	80 km/h
905	97.89	100 km/h
905	96.52	Slower Traffic Keep Right
905	96.19	Keep to left of barrier (right side)
905	95.99	Lane Ends 200m
905	95.79	Lane Ends
905	95.77	Intersection Warning
905	95.41	Keep to left of barrier (right side)
905	95.37	80 km/h ahead
905	95.37	Left Curve Warning
905	95.18	80 km/h
905	95.11	Curve Warning (70km/h)
905	94.95	2 right curve chevrons
905	94.94	2 left curve chevrons
905	94.62	Keep to right of barrier (left side)
905	94.16	Avalanche Area Do Not Stop for 5km
905	94.08	80 km/h
905	93.98	Right Curve Warning
905	93.89	Highway Gate
905	93.44	Keep to left of barrier (right side)
905	93.42	Falling Rocks
905	93.38	Left curve Warning
905	93.15	Slower Traffic Keep Right
905	92.96	Lane Ends 200m

905	92.76	Lane Ends
905	92.5	3 left curve chevrons
905	92.03	Falling Rocks
905	92	Keep to left of barrier (right side)
905	91.6	Curve Warning (60km/h), Keep to left of barrier (right side)
905	91.06	Slippery Road
905	91	Passing Lane 2km ahead
905	90.93	90 km/h
905	90.05	Keep to left of barrier (right side)
905	89.1	Deer crossing (8km)
905	88.88	90 km/h
905	88.73	Slower Traffic Keep Right
905	88.7	End of Avalanche Area
905	88.51	Chains must be put on here unless equipped with winter-tread tires in good condition
905	88.38	Entering Fraser Valley
905	87.1	Keep to left of barrier (right side)
905	87	Lane Ends 200m
905	86.8	Lane Ends
905	86.37	Keep to left of barrier (right side)
905	85.8	Keep to left of barrier (right side)
905	84.9	Keep to left of barrier (right side)
905	84.02	Keep to left of barrier (right side)
905	83.63	Keep to left of barrier (right side)
905	83.02	Slower Traffic Keep Right
905	83	Deer Crossing
905	81.8	Intersection Warning
905	81.15	Keep to left of barrier (right side)
905	80.75	90 km/h
905	80.75	Lane Ends 200m
905	80.6	Lane Ends
905	79.59	Slower Traffic Keep Right
905	79.34	90 km/h
905	79.08	Merge ahead
905	78.9	Lane Ends 200m
905	78.7	Lane Ends
905	78.4	Slippery
905	78.37	Intersection Warning
905	78.3	Keep to left of barrier (right side)
905	77.95	Merge
905	77.7	Keep to left of barrier (right side)
905	77.35	Keep to left of barrier (right side)
905	77.18	Do Not Pass
905	76.73	Curve Warning
905	76.68	Elk Warning (5km)
905	75.97	90 km/h
905	75.8	Keep to left of barrier (right side)
905	75.33	Keep to left of barrier (right side), Keep to right of barrier (left side)
905	74.76	Slower Traffic Keep Right
905	74.5	Falling Rocks
905	74.27	Logging Trucks
905	73.87	Lane Ends 200m

905	73.7	Lane Ends
905	73.65	Falling Rocks
905	73.64	Keep to left of barrier (right side)
905	73.22	Keep to left of barrier (right side)
905	72.71	Slower Traffic Keep Right
905	71.1	Trucks Turning
905	71.03	Keep to left of barrier (right side)
905	70.6	Highway Gate
905	70.43	Lane Ends Ahead
905	70.3	Lane Ends
905	69.99	No Stopping Avalanche Area
905	69.75	Keep to left of barrier (right side)
905	69.23	Slower Traffic Keep Right
905	68.83	Do Not Pass When Lights Flashing (School Bus)
905	68.74	Curve Warning
905	68.4	Falling Rocks
905	68.3	Lane Ends 200m
905	68.1	Lane Ends
905	67.92	Keep to left of barrier (right side)
905	67.9	Do Not Pass When Lights Flashing (School Bus)
905	67.72	Keep to left of barrier (right side)
905	67.34	Keep to left of barrier (right side)
905	66.92	End of Avalanche Area
905	66.91	50 km/h ahead
905	66.65	50 km/h
905	66.49	No Parking
905	66.35	No Parking
905	66.3	Checkered Pedestrian Crossing
905	65.77	60 km/h
905	65.61	50 km/h when children on highway
905	65.45	60 km/h
905	65.26	Keep to left of barrier (right side)
905	65.02	60 km/h
905	65.02	Pedestrian Crossing
905	64.82	Trucks Turning
905	64.51	90 km/h
905	64.42	Deer Crossing
905	63.78	Highway Gate
905	63.5	Report Aggressive Drivers Sign
905	63.12	Keep to left of barrier (right side)
905	62.95	Keep to left of barrier (right side)
905	62.48	Keep to left of barrier (right side)
905	60.44	Keep to left of barrier (right side)
905	60.2	Avalanche Area, Do Not Stop for 5km
905	59.74	Falling Rocks
905	59.61	Slower Traffic Keep Right
905	59.55	Falling Rocks
905	59.08	Lane Ends 200m
905	58.92	Lane Ends
905	58.89	80 km/h ahead
905	58.8	Tunnel (Remove Sunglasses)
905	58.78	80 km/h

905	58.55	Use Head Lights Thru Tunnel
905	58.51	Prepare to Stop When Amber Flashing (overhead)
905	58.5	Bike and Car sign
905	58.3	Cyclists in tunnel warning
905	58.28	No Stopping in Tunnels
905	58.21	Object Marker - Tunnel Start
905	57.57	Tunnel End
905	57.52	80 km/h
905	57.04	Slower Traffic Keep Right
905	56.1	Lane Ends 200m
905	56.03	No Stopping Avalanche Area
905	55.8	Lane Ends
905	55.6	Keep to either side of barrier (right side)
905	55.41	80 km/h
905	55.2	5.28m height limit
905	55.11	Slower Traffic Keep Right
905	55.1	5.28m height limit overhead
905	54.9	Keep to either side of barrier (right side)
905	54.73	80 km/h
905	54.58	Keep to left of barrier (right side)
905	54.4	Rocks Falling
905	54.25	Lane Ends 200m
905	54.2	Lane Ends
905	53.8	Keep to left of barrier (right side)
905	53.73	Keep to left of barrier (right side)
905	53.6	1 right curve chevron, (immediately after) 6 left curve chevrons
905	53.24	Cyclists in tunnel warning
905	53.22	Use Head Lights Thru Tunnel
905	53.1	Object Marker - Tunnel Start
905	52.93	Tunnel End
905	52.9	Trucks Turning
905	52.83	Object Marker - Tunnel Start
905	52.8	Keep to left of barrier (right side), Keep to right of barrier (left side)
905	52.66	Tunnel End
905	52.5	Keep to either side of barrier (right side), Grade Warning
905	52.33	No Stopping
905	52.28	Falling Rocks
905	52.27	90 km/h
905	52.27	No Stopping
905	52.12	Keep to left of barrier (right side)
905	52	Keep to left of barrier (right side)
905	51.86	Right Curve Warning
905	51	Do Not Pass
905	50.63	Curve Warning
905	50.37	Keep to left of barrier (right side)
905	49.82	Keep to left of barrier (right side)
905	49.3	Curve Warning
905	49.15	Keep to left of barrier (right side)
905	49.11	90 km/h
905	49	Avalanche Area - Do Not Stop, Keep to left of barrier (right side)
905	48.5	Tunnel (Remove Sunglasses)
905	48.33	Use Head Lights Thru Tunnel

905	48.3	Bike and Car sign
905	48.29	Rocks Falling
905	48.25	"Cyclists in Tunnel When Lights Flashing"
905	48.24	Object Marker - Tunnel Start
905	47.92	Tunnel End
905	47.9	Curve Warning
905	47.67	Keep to left of barrier (right side)
905	47.4	Keep to left of barrier (right side)
905	46.9	Keep to left of barrier (right side)
905	45.4	Heavy Trucks
905	45.2	Avalanche Area
905	45.02	Keep to left of barrier (right side)
905	44.79	Frost Warning Bridge Decks Ahead May Be Slippery
905	44.35	Keep to left of barrier (right side), Keep to right of barrier (left side)
905	44.33	Fraser River (at Alexandra Bridge)
905	43.26	Road Closed Gate (left)
905	43.12	Intersection Warning (1st Ave.)
905	42.85	Slower Traffic Keep Right
905	42.74	Logging Trucks
905	41.9	90 km/h
905	41	Intersection Warning
905	40.84	Lane Ends 200m
905	40.8	Trucks Turning
905	40.7	Tunnel (Remove Sunglasses)
905	40.65	Lane Ends
905	40.37	Left Curve Warning
905	40.1	Keep to right of barrier (left side)
905	40	Keep to left of barrier (right side), Keep to right of barrier (left side)
905	39.08	Right Curve Warning
905	37.7	Road Closed Gate, Keep to left of barrier (both on right side)
905	37.22	90 km/h
905	36.98	No Stopping Avalanche Area
905	36.9	Slide Area
905	36.9	Slide Area
905	36.6	Tunnel (Remove Sunglasses)
905	36.57	Caution Ice in Tunnel
905	36.47	Use Head Lights Thru Tunnel
905	36.32	Cyclists in tunnel warning
905	36.31	Object Marker - Tunnel Start
905	36.28	Keep to left of barrier (right side), Keep to right of barrier (left side)
905	36.01	Tunnel End
905	35.8	End of Avalanche Area
905	34.7	Avalanche Area
905	34.5	Keep to left of barrier (right side)
905	34.4	Trucks - Curve Warning (50km/h)
905	34.2	2 left curve indicators
905	33.8	3 right curve indicators
905	33.6	Falling Rocks
905	33.43	Keep to left of barrier (right side)
905	33.14	Keep to left of barrier (right side)
905	32.53	End of Avalanche Area
905	32.43	Keep to left of barrier (right side), Keep to right of barrier (left side)

905	30.1	Use Headlights in Tunnel
905	30	Cyclists in tunnel warning
905	29.99	Object Marker - Tunnel Start
905	29.9	Keep to left of barrier (right side), Keep to right of barrier (left side)
905	29.83	Tunnel End
905	28.76	Slippery Road
905	28.74	No Stopping Avalanche Area
905	28.5	Right Curve Warning (70km/h)
905	28.03	Grade Warning (7%), No left turn
905	27.6	Keep to left of barrier (right side), Keep to right of barrier (left side)
905	27.2	Overhead Sign - Right Curve Warning (Vehicle Tipping)
905	26.8	Right Curve Warning (70km/h)
905	26.79	Falling Rocks
905	26.78	4 right curve indicators
905	26.4	Keep to left of barrier (right side), Falling Rocks
905	26.2	Tunnel (Remove Sunglasses)
905	26.19	Use Headlights in Tunnel
905	26.1	Cyclists in tunnel warning
905	26.1	Object Marker - Tunnel Start
905	26.09	Keep to left of barrier (right side), Keep to right of barrier (left side)
905	25.77	Tunnel End
905	25.68	70 km/h
905	25.51	50 km/h ahead
905	25.4	Keep to left of barrier (right side)
905	25.2	50 km/h
905	25.1	Do Not Pass When Lights Flashing (School Bus)
905	25.09	Avalanche Area
905	25.08	Highway Gate
905	24.83	Curve Warning (Vehicle Tipping), Keep to left of barrier (right side), Keep to right of barrier (left side)
905	24.62	No Parking
905	24.6	Emergency Vehicle Access
905	24.6	Right Curve Warning
905	24.59	No Parking
905	24.5	Emergency Vehicle Sign, Overhead Sign- prepare to stop when amber flashing
905	24.12	Keep to either side of barrier (left side)
905	24.02	70 km/h
905	23.37	Starburst sign (60km/h)
905	23.3	Right turn
905	23.1	Keep to right of barrier (left side)
905	23	Trucks Turning
905	22.7	Curve Warning (60km/h)
905	22.05	Keep to left of barrier (right side), Keep to right of barrier (left side)
905	21.92	90 km/h
905	20.97	Slower Traffic Keep Right
905	20.78	Deer Crossing
905	19.6	Do Not Pass When Lights Flashing (School Bus)
905	18.64	Lane Ends 200m
905	18.48	Lane Ends
905	18.22	Emergency Vehicle Sign
905	17.32	2 in a row - Keep to left of barrier (right side), Keep to right of barrier (left side)
905	17.28	Slower Traffic Keep Right

905	17.2	Intersection Warning
905	16.4	Slower Traffic Keep Right
905	16.24	Loggin Trucks
905	15.43	Pedestrian Crossing
905	13.6	Intersection Warning
905	13.5	Pedestrian Crossing
905	13.48	Slower Traffic Keep Right
905	13.32	Keep to left of barrier (right side)
905	11.72	Do Not Pass When Lights Flashing (School Bus)
905	11.22	Keep to left of barrier (right side)
905	11.06	90 km/h
905	10.01	Entering Hope
905	9.32	Lane Ends 200m
905	9.2	Lane Ends
905	8.27	Keep to left of barrier (right side)
905	8.26	Keep to left of barrier (right side), Keep to right of barrier (left side)
905	8.04	Intersection Warning
905	6.73	Do Not Pass When Lights Flashing (School Bus)
905	6.6	Truck Entering
905	6.44	Lane Ends 200m
905	6.24	Lane Ends
905	6.06	Keep to left of barrier (right side)
905	5.6	Keep to either side of barrier (right side)
905	5.4	Left Curve Warning
905	5.23	Do Not Pass
905	4.9	Keep to left of barrier (right side)
905	4.52	Intersection Warning
905	4.3	Keep to left of barrier (right side)
905	4	Fraser Canyon Highway Safety Corridor Ends
905	3.79	Do Not Pass When Lights Flashing (School Bus)
905	3.25	70 km/h ahead
905	3	70 km/h
905	2.84	50 km/h ahead
905	2.75	50 km/h
905	2.25	overhead flashing 50 km/h curve warning
905	2.21	50 km/h
905	0.88	Pedestrian Crossing (with overhead b&w signing)

SEGMENT	OFFSET	DESCRIPTION
905	0.19	50 km/h
905	0.52	50 km/h
905	0.61	Pedestrian Crosswalk with Overhead Signing
905	0.71	50 km/h
905	0.99	50 km/h
905	2.33	90 km/h
905	3.37	Merge
905	3.43	Intersection Warning
905	3.56	Overhead Hwy 1 Information Sign
905	3.57	Highway Gate
905	3.58	Slower Traffic Keep Right
905	3.76	Do Not Pass When Lights Flashing (School Bus)
905	3.85	Fraser Canyon Highway Safety Corridor Begins
905	4	90 km/h
905	4.1	Keep to left of barrier (right side)
905	4.58	Right Curve Warning
905	4.93	Lane Ends 200m
905	5.03	Lane Ends
905	5.27	No Left Turn
905	5.44	Thru Movement Only
905	5.48	No Parking
905	5.5	No Left Turn
905	5.57	No Parking
905	5.78	Do Not Pass When Lights Flashing (School Bus)
905	6	Trucks Turning
905	6.2	Truck Entering
905	6.4	Report Aggressive Drivers
905	6.56	Keep to left of barrier (right side)
905	7.2	Intersection Warning
905	7.43	Keep to left of barrier (right side)
905	7.75	Keep to left of barrier (right side)
905	8.04	Keep to right of barrier (left side) and Keep to left of barrier (right side)
905	8.34	Deer Crossing
905	8.57	Slower Traffic Keep Right
905	10.13	Keep to left of barrier (right side)
905	10.7	90 km/h
905	11.37	Slower Traffic Keep Right
905	12.64	Pedestrian Crossing
905	13.06	Intersection Warning
905	13.2	Keep to left of barrier (right side)
905	13.86	Slower Traffic Keep Right
905	14.23	No Left Turn
905	14.34	Thru Movement Only
905	14.98	Pedestrian Crossing
905	15.6	Logging Trucks
905	15.82	Lane Ends 200m
905	15.92	Lane Ends
905	16.7	Left Curve Warning
905	16.77	Intersection Warning
905	16.82	Slow
905	17.1	Keep to left of barrier (right side)

905	17.11	Keep to right of barrier (left side) and Keep to left of barrier (right side)
905	17.63	Emergency Vehicle Sign
905	18.62	Do Not Pass When Lights Flashing (School Bus)
905	21.38	70 km/h ahead
905	21.59	70 km/h
905	21.84	Curve Warning (60km/h), Keep to right of barrier (left side) and keep to left of barrier (right side)
905	22.06	Keep to left of barrier (right side)
905	22.5	Trucks Turning
905	22.7	Starburst Warning (60km/h)
905	22.83	Right Curve Warning (60km/h)
905	22.87	Do Not Pass When Lights Flashing (School Bus)
905	23	Keep to left of barrier (right side)
905	23.52	50 km/h ahead
905	23.71	50 km/h
905	23.87	Keep to left of barrier (right side)
905	23.93	50 km/h
905	24.03	Emergency Vehicle Sign
905	24.1	Keep to left of barrier (right side)
905	24.15	Prepare to Stop When Amber Flashing (overhead)
905	24.3	Lights
905	24.7	Keep to left of barrier (right side)
905	24.7	Keep to right of barrier (left side) and Keep to left of barrier (right side)
905	24.88	Road Closed Gate, Keep to left of barrier (both on right side)
905	24.9	70 km/h
905	25.36	90 km/h
905	25.4	Tunnel (Remove Sunglasses)
905	25.41	Use Headlights in Tunnel
905	25.58	Cyclists in Tunnel
905	25.79	Tunnel Exit
905	26.07	Left Curve Warning (70km/h)
905	26.5	4 left curve chevrons
905	26.83	Pullout sign
905	27.3	Right Curve Warning (70km/h)
905	27.73	Slippery Road
905	27.83	Pullout sign
905	28.02	Curve Warning (70km/h)
905	28.38	Keep to left of barrier (right side)
905	28.6	End of Avalanche Area
905	29.42	Tunnel (Remove Sunglasses)
905	29.48	Use Headlights in Tunnel
905	29.58	Cyclists in Tunnel
905	29.66	Keep to right of barrier (left side) and Keep to left of barrier (right side)
905	29.69	Tunnel Exit
905	31.06	90 km/h
905	32.3	Keep to right of barrier (left side) and Keep to left of barrier (right side)
905	32.36	Truck 60 km/h alignment speed warning
905	32.37	Avalanche Area
905	32.54	Truck Curve Warning (60km/h)
905	32.8	Left Curve Warning
905	32.91	Keep to left of barrier (right side)
905	33.38	Keep to left of barrier (right side)
905	34.37	Pullout sign

905	34.5	Avalanche Area
905	34.52	Prepare to Stop When Amber Flashing (overhead)
905	34.68	Do Not Pass When Lights Flashing (School Bus)
905	35.5	Tunnel (Remove Sunglasses)
905	35.6	Use Headlights in Tunnel
905	35.63	Object Marker - Tunnel Entrance
905	35.75	Cyclists in Tunnel
905	35.8	Keep to right of barrier (left side) and Keep to left of barrier (right side)
905	36.01	Tunnel Exit
905	36.14	Slower Traffic Keep Right
905	36.8	Avalanche Area
905	37.44	Do Not Pass When Lights Flashing (School Bus)
905	37.85	Left Curve Warning
905	38.5	Lane Ends 200m
905	38.65	Lane Ends
905	38.88	Do Not Pass When Lights Flashing (School Bus)
905	39.75	Keep to left of barrier (right side)
905	39.77	Keep to right of barrier (left side) and Keep to left of barrier (right side)
905	39.9	Slower Traffic Keep Right
905	40.58	90 km/h
905	40.83	Spuzzum
905	41.3	Lane Ends 200m
905	41.44	Lane Ends
905	42.36	Trucks Turning
905	42.46	Intersection Warning
905	43.2	Road Closed Gate, Keep to left of barrier (both on right side)
905	43.29	Keep to left of barrier (right side)
905	43.68	Keep to right of barrier (left side) and Keep to left of barrier (right side)
905	43.72	Keep to right of barrier (left side) and Keep to left of barrier (right side)
905	44.36	Logging Truck
905	45.03	Falling Rocks
905	45.07	Avalanche Area
905	45.3	Keep to left of barrier (right side)
905	45.77	Keep to left of barrier (right side)
905	46.07	Slower Traffic Keep Right
905	46.76	Falling Rocks (1 km)
905	47.22	Lane Ends 200m
905	47.4	Lane Ends
905	47.49	Use Head Lights Thru Tunnel
905	47.6	Watch for cyclists (200m)
905	47.78	Tunnel (Remove Sunglasses)
905	47.83	Cyclists in Tunnel
905	47.84	Object Marker - Tunnel Entrance
905	47.9	Tunnel Exit
905	48.7	Keep to left of barrier (right side)
905	48.86	End of Avalanche Area
905	49.28	Slower Traffic Keep Right
905	49.88	Curve Warning
905	50.55	Falling Rocks
905	51.06	Lane Ends 200m
905	51.16	Lane Ends
905	51.72	Avalanche Area - Do Not Stop, Keep left of barrier (right side)

905	51.82	80 km/h ahead
905	51.98	80 km/h
905	52.05	No Stopping
905	52.18	No Left Turn
905	52.21	No Stopping
905	52.25	No Stopping
905	52.25	Use Head Lights Thru Tunnel
905	52.3	Tunnel (Remove Sunglasses)
905	52.31	No Stopping
905	52.38	Object Marker - Tunnel Entrance
905	52.4	No Left Turns
905	52.48	Tunnel Exit
905	52.5	Cyclists in Tunnel
905	52.58	Falling Rocks
905	52.59	Object Marker - Tunnel Entrance
905	52.83	Tunnel (Remove Sunglasses)
905	53.1	Keep to left of barrier (right side)
905	53.4	Falling Rocks
905	53.47	Keep to left of barrier (right side)
905	53.61	80 km/h
905	53.84	Thru Movement Only
905	54.33	No Stopping
905	54.43	No Stopping
905	54.5	5.28m height sign
905	54.5	No Stopping
905	54.53	No Left Turn
905	54.53	Pedestrian Overpass
905	54.61	No Stopping
905	54.81	5.28m overhead sign, no left turns
905	54.82	No Left Turn
905	55.3	Avalanche Area - Do Not Stop
905	55.52	Do Not Pass
905	56.64	80 km/h
905	57.06	Prepar to Stop (overhead flashing)
905	57.2	Use Head Lights Thru Tunnel
905	57.27	Object Marker - Tunnel Entrance
905	57.32	Watch for cyclists (200m)
905	57.5	Keep to right of barrier (left side) and Keep to left of barrier (right side)
905	57.5	Push Button when Entering Tunnel (cyclists)
905	57.91	Tunnel Exit
905	58.38	Deer Crossing
905	58.49	90km/h
905	58.84	Falling Rocks
905	59.66	Left Curve Warning
905	60.1	End if Avalanche Area
905	62.6	Keep to left of barrier (right side)
905	62.65	Keep to right of barrier (left side) and Keep to left of barrier (right side)
905	63.47	Highway Gate
905	63.65	Truck Crossing
905	63.7	Road Closed Gate
905	63.99	80 km/h ahead
905	64.24	80 km/h

905	64.46	Pedestrian Crossing
905	64.75	60 km/h
905	65	Children Crossing (School Zone)
905	65.21	50 km/h ahead
905	65.46	50 km/h
905	65.9	Pedestrian Crossing
905	66	Slippery Road
905	66.19	Emergency Vehicle Sign
905	66.28	Highway Gate
905	66.37	90 km/h
905	66.5	Checkered Sign
905	66.59	Road Closed Gate
905	66.78	Falling Rocks
905	66.81	Avalanche Area Begins
905	67.35	Keep to left of barrier (right side)
905	67.55	Report Aggressive Drivers
905	67.68	Keep to left of barrier (right side)
905	67.76	Do Not Pass When Lights Flashing (School Bus)
905	68.02	Curve Warning
905	68.08	Keep to left of barrier (right side)
905	68.16	Elk Crossing
905	69.38	Keep to left of barrier (right side)
905	69.56	Slower Traffic Keep Right
905	70.02	End of Avalanche Area
905	70.34	Trucks Turning
905	71.39	Keep to left of barrier (right side)
905	72.39	Keep to right of barrier (left side)
905	72.4	Lane Ends 200m
905	72.64	Lane Ends
905	72.71	Falling Rocks
905	73.3	Logging Trucks
905	73.47	Falling Rocks
905	75	Keep to right of barrier (left side) and Keep to left of barrier (right side)
905	75.23	Slower Traffic Keep Right
905	75.92	Elk Crossing for 8km
905	76.82	Trucks Turning
905	77.21	Slower Traffic Keep Right
905	77.88	Intersection Warning
905	77.9	90 km/h
905	78.07	Keep to either side of barrier (left side)
905	78.2	Slippery Road
905	78.4	Elk Crossing
905	80.3	Keep to left of barrier (right side)
905	81.02	Do Not Pass
905	81.15	Lane Ends 200m
905	81.3	Lane Ends
905	81.37	Intersection Warning
905	82.23	Keep to left of barrier (right side)
905	83.36	Keep to left of barrier (right side)
905	86.18	Slower Traffic Keep Right
905	88.5	Slower Traffic Keep Right
905	88.67	Avalanche Area (6km)

905	89.79	Slower Traffic Keep Right
905	89.84	Falling Rocks (2km)
905	90.42	80 km/h ahead
905	90.54	80 km/h
905	90.95	Lane Ends 200m
905	91.07	Lane Ends
905	91.28	Falling Rocks
905	91.9	60 km/h (warning)
905	92.04	Slippery Road
905	92.12	Grade Warning (7%)
905	92.22	Falling Rocks
905	92.37	Starburst Warning (60km/h)
905	92.38	3 right curve chevrons, 3 left curve chevrons
905	93.28	No Left Turns
905	93.4	Left Curve Warning
905	93.6	Highway Gate
905	93.61	Intersection Warning
905	93.62	80 km/h
905	93.7	Left Curve Warning
905	93.8	Keep to left of barrier (right side)
905	93.9	Keep to left of barrier (right side)
905	94.06	Road Closed Gate
905	94.22	Elk Crossing for 5 km
905	94.37	End of Avalanche Area
905	94.72	Curve Warning (70km/h)
905	94.82	Keep to left of barrier (right side)
905	94.83	2 left curve indicators, 2 right curve indicators
905	94.89	100 km/h
905	95.17	Left Curve Warning
905	95.21	Intersection Warning
905	95.42	Left Curve Warning, Keep to left of barrier (right side)
905	95.49	Do Not Pass
905	95.6	Right Curve Warning
905	95.9	Keep to left of barrier (right side)
905	96.8	Keep to left of barrier (right side)
905	97	Falling Rocks
905	97.15	Right Curve Warning, Keep to left of barrier (right side)
905	97.36	Do Not Pass When Lights Flashing (School Bus)
905	97.47	Elk Crossing for 5 km
905	97.53	80 km/h ahead
905	97.67	80 km/h
905	97.82	Do Not Pass When Lights Flashing (School Bus)
905	98.58	100 km/h
905	99.35	Slower Traffic Keep Right
905	99.43	Left Curve Warning (80km/h)
905	99.47	Rocks Falling
905	100.49	Slower Traffic Keep Right
905	101.48	Slow
905	101.6	Keep to left of barrier (right side)
905	101.61	Curve Warning (70km/h)
905	101.66	Do Not Pass
905	101.73	Lane Ends 200m

905	101.96	Lane Ends
905	101.97	Do Not Pass
905	102.4	Elk Crossing for 2km
905	102.66	Truck overhead 60 km/h alignment speed warning
905	102.73	Keep to left of barrier (right side)
905	103.1	Overhead Sign - Curve Warning (60km/h)
905	103.5	Slippery Road
905	103.51	Curve Warning (70km/h)
905	103.8	3 left curve chevrons
905	103.9	3 right curve chevrons
905	104.57	Right Curve Warning
905	104.58	Do Not Pass
905	106.34	Left Curve Warning
905	106.7	Trucks Turning
905	106.75	Curve Warning
905	107.02	West Side - Highway Gate
905	107.47	Elk Crossing for 5 km
905	107.73	Right Curve Warning
905	108.3	Pedestrian Crosswalk
910	0.03	School Zone
910	0.3	Pedestrian Crossing
910	0.37	Slower Traffic Keep Right
910	0.4	100 km/h
910	0.66	Right Curve Warning
910	2.02	100 km/h
910	2.28	Slower Traffic Keep Right
910	2.43	Right Curve Warning
910	2.96	Keep to either side of barrier (right side)
910	3.34	Lane Ends 200m
910	3.49	Lane Ends
910	3.86	Falling Rocks
910	4.39	Slower Traffic Keep Right
910	5.16	Report Aggressive Drivers
910	5.34	Slow
910	5.39	Curve Warning (70km/h)
910	5.43	Slippery Road
910	5.46	7 right curve chevrons
910	5.96	Intersection Warning
910	6.58	Slower Traffic Keep Right
910	7.26	Curve Warning (80km/h)
910	7.58	Right Curve Warning
910	7.6	Slow
910	7.96	Intersection Warning
910	8.5	Do Not Pass When Lights Flashing (School Bus)
910	8.71	100 km/h
910	9.52	Keep to left of barrier (right side)
910	9.8	Left Curve Warning (80km/h)
910	10	Keep to left of barrier (right side)
910	10.11	Lane Ends 200m
910	10.22	Slower Traffic Keep Right
910	10.34	Lane Ends
910	10.56	Falling Rocks

910	10.94	Lane Ends 200m
910	11.1	Lane Ends
910	11.21	Rocks Falling
910	11.22	Slippery Road
910	11.3	Right Curve Warning (60km/h)
910	11.33	3 right curve chevrons
910	11.36	4 left curve chevrons
910	12.02	Falling Rocks
910	12.06	Right Curve Warning
910	12.33	Grade Warning (7%) - Trucks Gear Down
910	12.64	Do Not Pass
910	12.88	Curve Warning (70km/h)
910	13.04	Falling Rocks
910	13.06	Left Curve Warning
910	13.12	Object Marker - Rail Bridge Overhead
910	13.24	Slow
910	13.26	4.98 height sign
910	13.64	3 left curve chevrons
910	13.76	Starburst Warning (40km/h) Curve Warning
910	14.06	40km/h sign
910	14.46	Keep to left of barrier (right side)
910	15.42	Keep to left of barrier (right side)
910	15.44	Left Curve Warning
910	15.78	Right Curve Warning (60km/h), Keep to left of barrier (right side)
910	16.26	Keep to left of barrier (right side)
910	16.54	Keep to left of barrier (right side)
910	16.55	slow
910	16.76	Keep to left of barrier (right side)
910	16.82	Object Marker - Rail Bridge Overhead
910	17.06	Curve Warning (50km/h)
910	17.22	50 km/h overhead sign
910	17.26	height sign
910	17.46	6 left curve chevrons
910	17.76	Left Curve Warning
910	18.06	Keep to left of barrier (right side)
910	18.14	Keep to left of barrier (right side)
910	18.37	Slower Traffic Keep Right
910	18.46	Slow
910	18.59	6 right curve chevrons
910	18.59	Right Curve Warning (70km/h)
910	19	Left Curve Warning
910	19.54	Right Curve Warning (80km/h)
910	19.66	Lane Ends 200m
910	19.86	Lane Ends
910	20.59	Left Curve Warning
910	20.91	Do Not Pass
910	21.96	Keep to left of barrier (right side)
910	22.19	Heavy Trucks
910	22.33	Slippery Road
910	22.35	Do Not Pass
910	22.36	Left Curve Warning
910	23.5	Left Curve Warning

910	23.9	Keep to left of barrier (right side)
910	24.21	100 km/h
910	25.18	Right Curve Warning (80km/h)
910	25.3	Keep to left of barrier (right side)
910	25.47	Thru Movement Only
910	25.9	Right Curve Warning
910	25.96	Keep to either side of barrier (right side)
910	26.03	Keep to left of barrier (right side)
910	26.56	Keep to left of barrier (right side)
910	27.23	Slower Traffic Keep Right
910	28.12	Bumpy Road, Slippery Road
910	28.23	Keep to left of barrier (right side)
910	29.37	No Left Turn
910	29.49	Lane Ends 200m
910	29.76	Lane Ends
910	29.96	Slippery Road
910	30.07	Keep to left of barrier (right side)
910	30.26	Right Curve Warning
910	30.46	100 km/h
910	30.86	Heavy Trucks
910	31.16	Keep to left of barrier (right side)
910	31.76	Keep to right of barrier (left side), Keep to left of barrier (right side)
910	31.77	Right Curve Warning
910	32.44	Right Curve Warning
910	32.9	Keep to left of barrier (right side)
910	33.16	Left Curve Warning
910	33.28	Keep to left of barrier (right side)
910	33.63	Keep to left of barrier (right side)
910	33.7	Right Curve Warning
910	33.86	Keep to left of barrier (right side)
910	34.41	Right Curve Warning (80km/h)
910	34.85	JCT B 300m
910	35.09	Highway Gate (SB Only)
910	35.96	Keep to either side of barrier (right side)
910	36.14	Elk Crossing
910	36.18	70 km/h
910	36.21	Slippery Road
910	36.36	Keep to right of barrier (left side), Keep to left of barrier (right side)
915	0.87	Caution Big Horn Sheep Crossing
915	1.99	\$2000 Maximum Penalty for Littering
915	2.65	Do Not Pass When Lights Flashing (School Bus)
915	3.1	Slower Traffic Keep Right
915	3.23	Left Curve Warning
915	3.37	Keep to left of barrier (right side)
915	4.87	Curve Warning
915	4.95	Keep to left of barrier (right side)
915	5.03	Right Curve Warning
915	5.71	Keep to left of barrier (right side)
915	5.94	Keep to left of barrier (right side)
915	6.23	Intersection Warning
915	6.38	Lane Ends 200m
915	6.53	Lane Ends

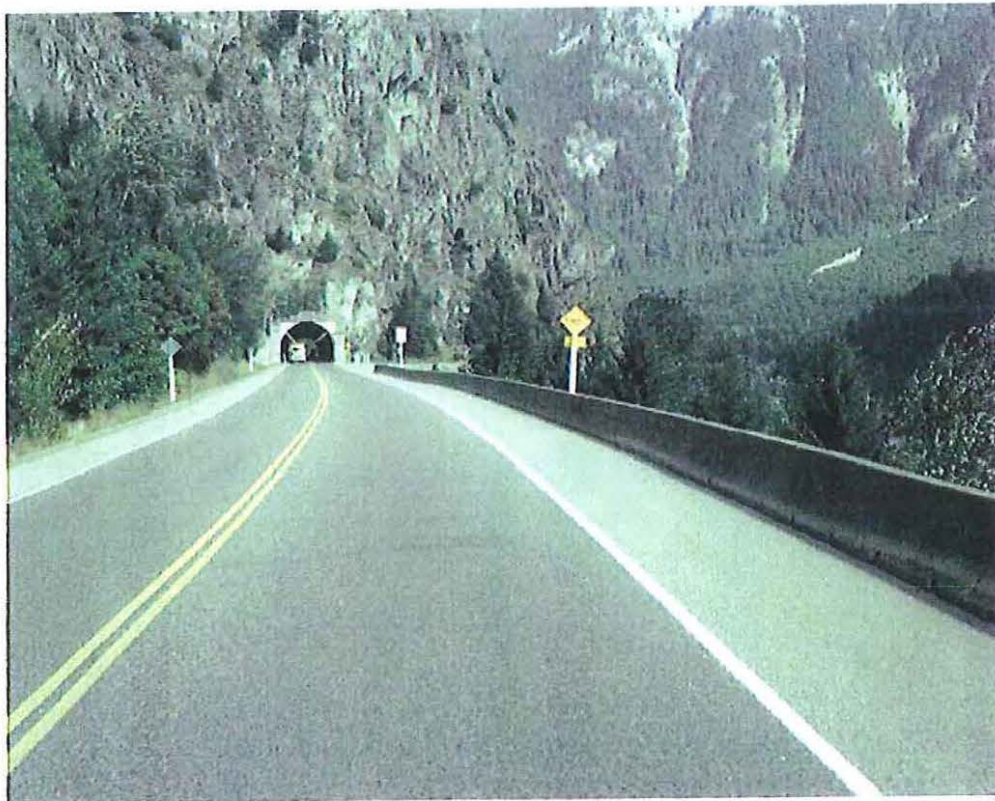
915	7.95	Keep to left of barrier (right side)
915	8.46	Left Curve Warning
915	9.05	Keep to left of barrier (right side)
915	9.16	Slower Traffic Keep Right
915	9.78	Keep to left of barrier (right side)
915	10.11	Lane Ends 200m
915	10.17	Lane Ends
915	10.43	Left Curve Warning
915	11.4	Slow
915	11.48	Curve Warning (60km/h)
915	11.77	Curve Warning (60km/h)
915	11.86	Keep to left of barrier (right side)
915	11.97	Trucks 60 km/h Speed Advisory
915	12.13	Slower Traffic Keep Right
915	12.45	Slow
915	12.53	Curve Warning (60km/h)
915	12.65	Curve Warning for Trucks (60km/h)
915	12.69	1 left curve chevron
915	13.26	Keep to left of barrier (right side)
915	13.75	Keep to left of barrier (right side)
915	13.93	Keep to left of barrier (right side)
915	14.17	100 km/h
915	15.13	Lane Ends 200m
915	15.26	Lane Ends
915	15.97	Keep to left of barrier (right side)
915	16.08	Falling Rocks
915	16.2	Slow
915	16.27	Left Curve Warning (70km/h)
915	16.69	Keep to left of barrier (right side)
915	17.28	Slower Traffic Keep Right
915	18.91	Keep to left of barrier (right side)
915	19.41	Keep to left of barrier (right side)
915	19.78	Slower Traffic Keep Right
915	20.43	Keep to left of barrier (right side)
915	21.86	Do Not Pass When Lights Flashing (School Bus)
915	22.22	100 km/h
915	22.61	Keep to left of barrier (right side)
915	24.05	Lane Ends 200m
915	24.2	Lane Ends
915	24.55	Keep to left of barrier (right side)
915	24.57	Logging Trucks
915	26.08	Keep to left of barrier (right side)
915	26.8	Left Curve Warning
915	30.45	Do Not Pass When Lights Flashing (School Bus)
915	32.14	100 km/h
915	33.85	Fraser Canyon Highway Safety Corridor Ends
915	35.26	Strong Crosswinds for 3km
915	36.68	Trucks Turning
915	38.1	100 km/h
915	38.23	No Parking (to N of sign)
915	39.79	No Parking (to S of sign)
915	41.16	Keep to left of barrier (right side)

915	42.31	Slower Traffic Keep Right
915	43.5	JCT 97C 300m
915	44.29	Slower Traffic Keep Right
917	0.19	100 km/h
917	0.36	Keep to either side of barrier (right side)
917	0.51	Merge
917	1.61	Heavy Trucks
917	2.18	70 km/h ahead
917	2.41	Keep to either side of barrier (1 on each side)
917	2.46	70 km/h
917	2.82	50 km/h ahead
917	3.05	50 km/h



Ministry of Transportation

Highway 1, Hope to Cache Creek Safety Assessment PHASE 1 SUMMARY REPORT



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ND LEA Inc.

236 St. Paul Street
Kamloops, BC V2C 6G4
(250) 828 1511
www.ndlea.com

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1. INTRODUCTION

The Trans Canada Highway #1 between Hope and Cache Creek was historically the primary route connecting the Lower Mainland with the rest of Canada. With the opening of the Coquihalla Highway in the 1980's, the role of the section of the TCH between Hope and Cache Creek changed, and its role as a good movement route is now more closely tied with economic activities in Northern British Columbia.

The Coquihalla Highway is a high speed route, thus there has been no significant capital investment on Highway 1 to support improved mobility. While the Highway 1 route is generally at a lower elevation than the Coquihalla Highway, it passes through very steep and challenging terrain. As a result, the highway has steep grades and tight curves. With increased economic activity in the north associated with pine beetle harvest, oil and gas activity and related growth, additional truck traffic on Highway 1 has generated concern related to highway safety.

This study was initiated in response to these safety concerns, and specifically safety concerns raised by the BC Trucking Association. In Phase 1 of this report, the corridor as a whole has been examined to determine relative safety and an accident prone location list. Accident prone locations and sections were identified and ranked in terms of relative severity. A subsequent Phase 2 report will examine in greater detail the most severe locations identified in Phase 1, and propose potential solutions to mitigate any safety issues for those specific locations.

Phase 1 of the study is primarily based on a review of existing data. A limited amount of new traffic data was collected for this phase (specifically a 24-hour classification count), but the majority of the analysis was based on the Ministry of Transportation vehicle count and collision database. One of the primary objectives of this first phase of the study is to provide background information based on accepted analytical methods consistently applied to corridors in the province. Initial consultation with stakeholders has been limited, but will be more extensive in Phase 2 to help better define problems and to allow more qualitative information to be considered.

This report provides a summary of the Phase 1 results.

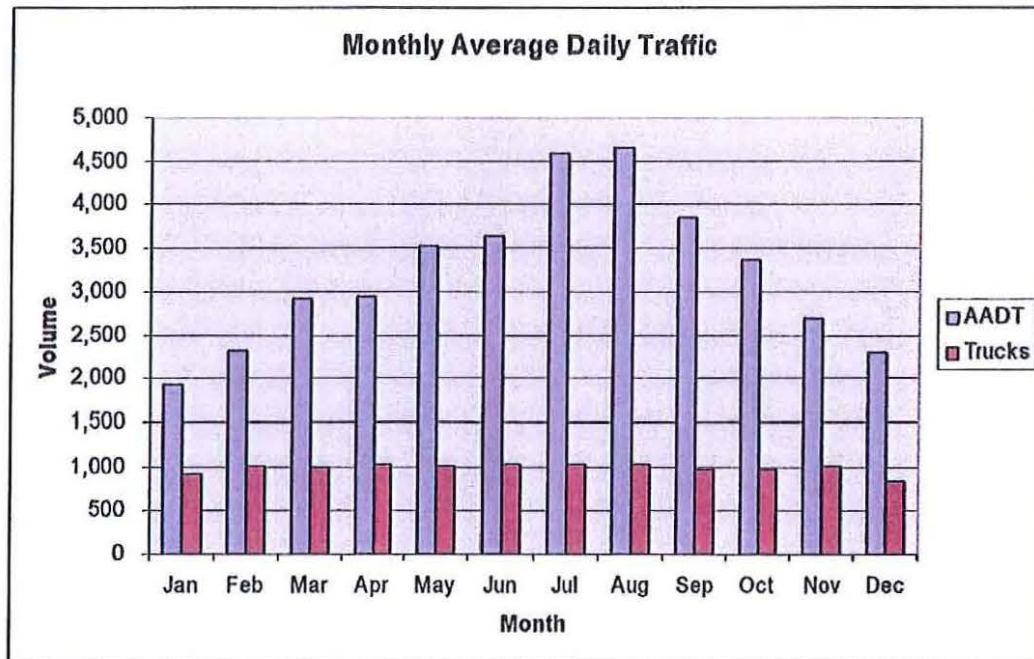
2. CURRENT USE

This section provides a summary of the existing use of the highway, illustrating trends in traffic related to seasonal variation and vehicle classification.

2.1 Monthly Variation

Figure 2.1 shows the monthly average daily traffic at China Bar for 2005. The figure also shows the truck volume (vehicles over 12.5 m in length) on a monthly basis.

Figure 2.1: Monthly Average Daily Traffic (2005)

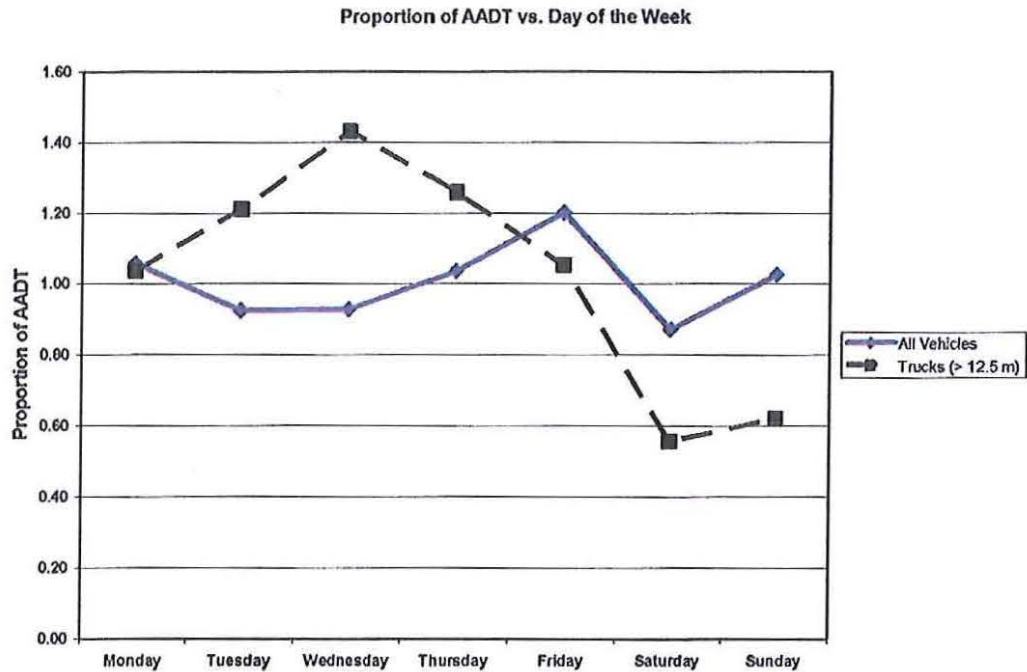


As illustrated, the total volume increases substantially during the summer months, reflecting a the high influence of tourism traffic during that period. The figure also shows that the truck volume remains constant throughout the year. This means that the proportion of trucks in the overall traffic stream varies considerably, from 46% in January to less than 2% in August.

2.2 Day of the Week Variation

The day of the week variation at China Bar is shown in Figure 2.2.

Figure 2.2: Day of the Week Variation



The day-of-week travel patterns are consistent with other rural highways, particularly those with high tourist traffic. Volumes are highest on Friday, when tourist traffic is high, and when commuter, goods movement and other commercial travel also occurs. Truck traffic peaks during mid-week, which again is typical of truck travel patterns.

2.3 Hourly Distribution

Figure 2.3 illustrates the hourly distribution of traffic through the day. This chart is based on a 24-hour classification count conducted at Lytton in August 2006.

Figure 2.3:

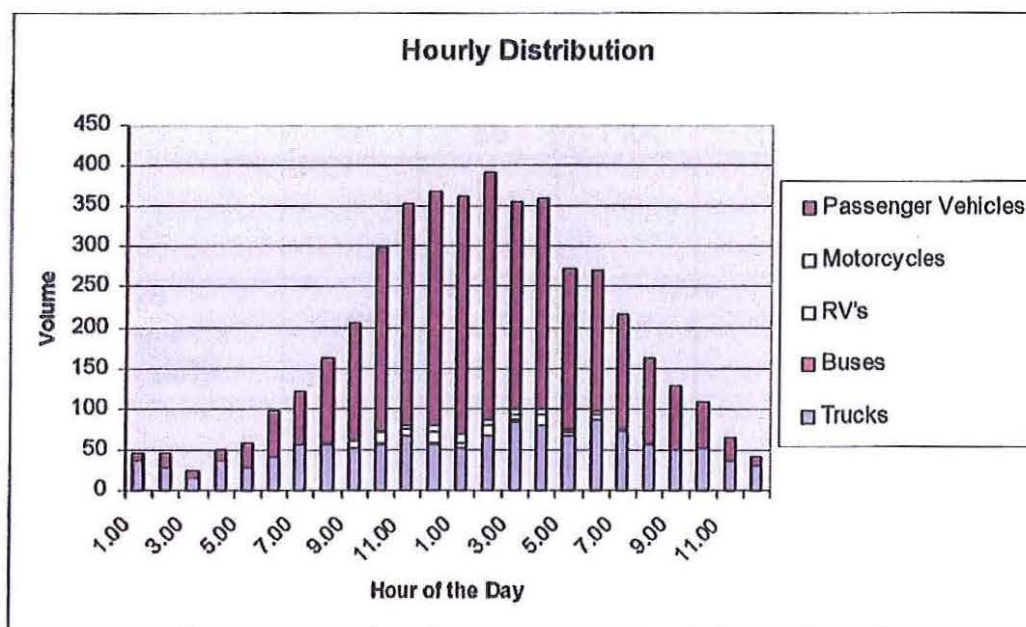


Table 2.1 summarizes the results of the 24-hour classification count conducted at Lytton and Spences Bridge.

4. SAFETY REVIEW

In this initial phase of the safety assessment, the performance is focused on general characteristics along the entire corridor, based on quantitative assessment.

4.1 Historical Rate and Frequency

Table 4.1 provides a summary of the historical collisions by LKI Segment.

Table 4.1: Collision Frequency and Rate (2001-2005)

LKI Segment	2006 AADT Estimate	Collision Frequency		Collision Rate
		All Vehicles	Truck Involves	Collisions / MVK*
905 (Hope to Lytton)	3815	385	178	0.51
910 (Lytton to Spence's Bridge)	3520	117	46	0.51
915 (Spence's Bridge to Ashcroft)	3658	144	45	0.47
917 (Ashcroft to Cache Creek)	6086	42	17	0.85
Total		688	286	0.51

* MVK – Million Vehicle Kilometres

The highest collision rate occurs on Segment 917 through Cache Creek. While this segment arguably has the best geometrics of any segment on the corridor, the high access density, urban nature of the adjacent land use and a mix of local and through traffic contribute to a high collision rate. Conversely, Segment 905, which includes all of the tunnels and some of the most challenging terrain, has the lowest collision rate. The frequency is high because this segment is the longest, thus increasing the overall exposure.

4.2 Severity

Figure 4.1 summarizes the collision severity on each segment for all vehicles, and separately for those collisions involving trucks. The chart shows the proportion of each severity class for all collisions and truck-involved collisions separately, allowing for a direct comparison of the severity of all and truck-involved collisions. While the highest collision rate occurs on Segment 917, the severity is lowest on this section, reflective of the lower travel speed through the urban area. The collision severity for truck-involved collisions is generally comparable to the severity for all collisions, but slightly lower, with the exception of Segment 910 where high severity (fatal and injury) accounted for 54% of all truck-involved collisions.

Figure 4.1: Collision Severity Summary

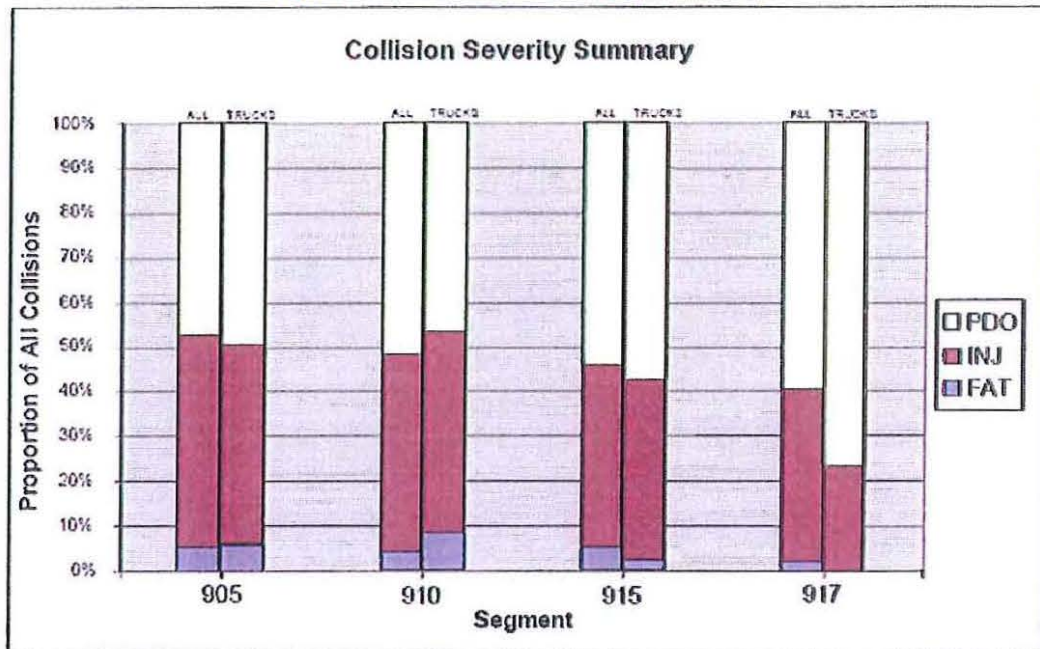


Table 4.2 compares collision rates on Highway 1 corridor to the critical rate and provincial average.

**Table 4.2: Comparison with Provincial Collision Trends
(Collisions / MVK)**

	Fatal	Injury	PDO	Total
Historical Observation	0.028	0.227	0.255	0.51
Provincial Average	0.013	0.23	0.29	0.53
Critical Rate				0.56
Ratio of Historical to Critical				0.91

As the table shows, the observed rate is less than the critical and provincial average rates for rural two-lane highways.

4.3 Truck Collision Trends

Table 4.3 summarizes the relationship between truck traffic proportions and the proportion of truck-involved collisions. As the table shows, the proportion of truck-involved collisions is higher than the proportion of trucks in the traffic stream, indicating that trucks are more likely to be involved in a collision on this corridor than passenger vehicles.

Table 4.3: Truck-Involved Collision Characteristics

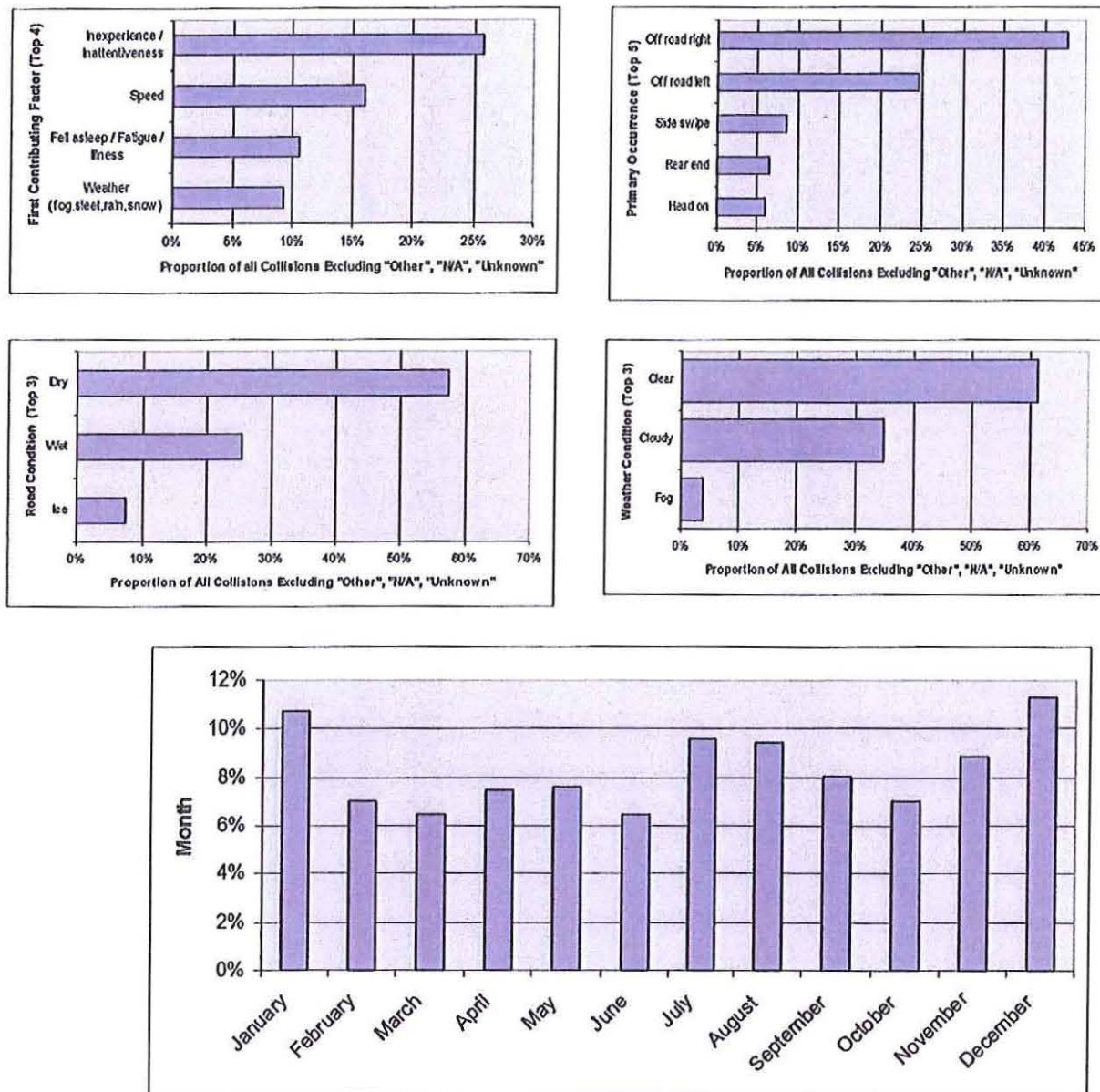
LKI Segment	2006 AADT Estimate	Percent Trucks	Total Collisions (2001 – 2005)	Percent Truck-Involved Collisions
905 (Hope to Lytton)	3815	29.8 %	385	46.2 %
910 (Lytton to Spence's Bridge)	3520	29.2 %	117	39.3 %
915 (Spence's Bridge to Ashcroft)	3658	29.1 %	144	31.3 %
917 (Ashcroft to Cache Creek)	6086	17.5 %	42	40.5 %
Total			688	41.6 %

4.4 Causal Factors

Figure 4.2 illustrates the most common casual factors on the Highway 1 corridor between Hope and Cache Creek. Factors related to driver inattentiveness or inexperience is reported as the most common first contributing factor. It is important to note that weather is reported as the first contributing factor for almost 10% of collisions, while speed accounts for over 15%. Both of these factors have a relationship to roadway condition and geometrics. Similarly, run-off-road is reported as the primary occurrence for approximately two-thirds of collisions. Run-off-road collisions are also often linked to roadway conditions and geometrics. Although weather was reported as the first contributing factors for almost 10% of collisions, poor weather conditions were not reported for a considerable proportion of collisions. The road condition was reported as something other than dry for one-third of collisions.

The highest collision months are January and December, when traffic volumes are lowest, supporting the suggestion that weather and road conditions are an importation factor in collision along this route.

Figure 4.2: Causal Factors Summary



4.5 Comparison with Other Corridors

A comparison with provincial averages provides an indication of how a particular corridor performs relative to typical conditions province-wide. A comparison with Highway 3 and 5 provides a better indication of the safety performance relative to other mountain corridors in the region. Table 4.4 provides a comparison summary.

Table 4.4: Comparison with Similar Mountain Corridors

	Highway 1 Hope to Spence's Bridge	Highway 3 Hope to Princeton	Highway 5 Hope to Merritt
Length (km)	145	110	133
Classification	RAU-2	RAU-2	RFD-4
2005 AADT (veh/day)	3777	3329	9085
Percent Trucks	30.5%	7.0 %	20.3%
Observed Collision Rate	0.51 coll/MVK	1.06 coll/MVK	0.74 coll/MVK
Provincial Average Collision Rate (for highway classification)	0.53 coll/MVK	0.53 coll/MVK	0.32 coll/MVK
Critical Collision Rate	0.62 coll/MVK	0.65 coll/MVK	0.42 coll/MVK
Total Collisions (2001-2005)	502	784	1251
Proportion of Collisions Involving Trucks	44.6 %	14.0%	12.5%

The traffic volumes are highest on the Coquihalla, which in turn generates the highest frequency of collisions of the three routes despite having the lowest collision rate. Highways 3 and 5 have collision rates that are higher (with statistical significance) than the provincial averages for comparable highways (rural two-lane for Highway 3 and rural freeway for Highway 5). Highway 1 however has an overall collision rate that is comparable to the provincial average for two-lane rural highway. While the proportion of truck-involved collisions is less than on Highway 1, it is double the proportion of trucks in the traffic flow, indicating that Highway 3 is considerably less safe for trucks than passenger cars.

On the Coquihalla Highway, the proportion of trucks involved collisions is less than the proportion of trucks in the traffic flow, indicating that historical truck safety performance has been better than for passenger vehicles.

4.6 Summary of Key Corridor Safety Findings

The key finding of the corridor-level safety review include:

- the overall collision rate is less than the provincial average for two-lane rural highways;
- weather, road conditions and geometrics appear to be major causal factors in collisions, even where driver factors are contributed;

- the proportion of all collisions that involve trucks is higher than the proportion of trucks in the traffic flow, indicating that the truck collision rate is higher than the collision rate for all vehicles; and
- the severity of truck-involved collisions is comparable to the severity trend of all collisions, with trucks-involved collisions having slightly higher severity in the south and considerably lower severity through Cache Creek.

5. COLLISION PRONE SECTIONS AND LOCATIONS

This section outlines the sections and locations on the corridor that should be further investigated in Phase 2 of this safety assessment. Two methods have been used to identify collision prone locations / sections, both of which rely on reported collision data.

5.1 Ministry of Transportation Method

The first method used by the Ministry of Transportation used a combination of collision frequency plus either collision rate or severity ratio as follows:

- observed rate is greater than the critical rate **OR** the severity ratio of greater than 8.0; **AND**
- the collision frequency for 2001 to 2005 is greater than 15 or more (3 per year or more).

On this basis, two collision prone sections and one collision prone location were identified as summarized in Table 5.1:

Table 5.1: Collision Prone Locations / Sectors

LKI Segment	KM		Location	Collision (All)	Frequency High Severity
	From	To			
905	16.2	17.1	Emory Creek Bridge	15	8
910	12.6	13.8	Tank Hill	21	7
917	4.6	4.6	Jct 1/97 Cache Creek	16	2

5.2 Collision Rate / Severity Rankings

Several sites were identified on the basis of collision rates on one kilometre sections. Table 5.2 lists all sections where the observed collision rate is greater than the corridor critical rate and the observed high severity (fatal plus injury) rate is greater than the corridor critical high severity rate. Corridor critical rates are the rates that must be exceeded to establish that a section has an observed rate that is statistically worse than the average conditions on Highway 1 between Hope and Cache Creek. In order to be included in Table 5.2, a section must have both an overall rate and a rate for high severity collisions that is higher than the average (with statistical significance) for the corridor. These locations were then ranked on the basis of the rate for the highest one-kilometre within the identified section.

Table 5.2: Ranked High Collision Rate Sections

Rank	Seg.	km		Location	km		Collision Rate	High Severity Rate
		From	To		From	To		
1	910	13.0	14.3	Tank Hill	13.2	14.1	2.96	1.25
2	905	10.9	14.5	Camper's Roost	11.7	12.6	2.90	1.57
3	917	3.7	4.1	Cache Creek	3.7	4.6	2.41	1.07
4	905	2.6	8.2	American Creek Bridge	3.0	3.9	2.05	1.20
5	905	102.6	104.4	Skuppa Rest Area	102.7	103.6	2.03	1.09
6	915	20.8	22.6	Oregon Jack Pit	21.0	21.9	2.00	1.07
7	905	23.6	25.5	Downtown Yale	24.1	25.0	1.93	1.09
8	905	15.8	17.4	Emory Creek Bridge	15.3	16.2	1.81	0.97
9	910	16.3	18.0	Nicomene Creek	16.8	17.7	1.71	1.25
10	905	27.3	28.8	Pullout Litter Barrel	27.7	28.6	1.45	0.84
11	910	5.0	6.0	Old Road Access	5.0	6.0	1.09	0.78
12	915	38.1	39.0	Junction S End of Ashcroft Loop	38.1	39.0	1.07	0.77
13	905	52.4	53.6	Ferrabee Tunnel and Retaining Wall	52.4	53.5	1.06	0.75

Ministry of Transportation

Highway 1, Hope to Cache Creek Safety Assessment

PHASE 2 - RECOMMENDED IMPROVEMENTS



Ministry of Transportation
South Coast and Southern Interior Region
Prepared By: Grant M. Irvine, P. Eng. Senior Transportation Planning Engineer
February 2007

INTRODUCTION

This study was initiated to investigate safety concerns raised by the BC Trucking Association and as part of the Ministry of Transportation contribution to the Fraser Canyon Highway Safety Corridor Initiative also involving WorkSafeBC, the Insurance Corporation of British Columbia and the RCMP. The Fraser Canyon Truck Crash Review Committee (FCTCRC) was formed to coordinate the safety initiative efforts in terms of engineering, enforcement and engineering.

The Ministry of Transportation commissioned ND Lea Inc. (Kamloops) to prepare the Phase 1 Summary Report – Highway 1, Hope to Cache Creek Safety Assessment (November 2006). The objective of this report was to provide a historical overview of corridor traffic and collision characteristics, identify collision prone sections/locations and prioritize the relative safety of other locations based on collision frequency and severity measures for all vehicle types on the route.

The Ministry of Transportation, with the assistance of ND Lea has produced this Phase 2 Report - Recommended Improvement Strategy (February 2007). The objective of the Phase 2 report included further screening to identify and prioritize truck-involved collision locations and recommend an improvement strategy for the corridor.

1.0 CORRIDOR ANALYSES

The Ministry's Highway Accident System (HAS) data between the years 2001 to 2005 (inclusive) was used to identify and assess relative safety on the corridor.

The Phase 1 Report (ND Lea) confirmed that overall collision rates for each of the four major segments of the corridor were at, or near the provincial average.

Collision Prone Sections/Locations - In order to be identified as a collision prone section/location, Ministry screening criteria requires that the crash history must exceed, 15 collisions in 5 years (3 per year) and the observed collision rate exceed the critical rate (a derived test of statistical significance relative to the provincial average collision rate for the class of roadway and traffic volume), or have a calculated severity ratio greater than 8.0. Based on the above criteria, ND Lea identified the locations shown in Table 2.1 as collision prone.

Table 2.1 - Collision Prone Sections / Locations

LKI Segment	KM		Location	Collision (All)	Frequency High Severity
	From	To			
905	16.2	17.1	Emory Creek Bridge	15	8
910	12.6	13.8	Tank Hill	21	7
917	4.6	4.6	Junction 1/97 Cache Creek	16	2

In order to provide more definitive context and ranking to other locations of interest along the corridor, ND Lea, applied further screening to identify areas with higher frequency and severity of collisions involving all vehicle types on the roadway. Table 2.2 provides a relative ranking for high collision rate sections on the corridor. It should be noted that collision rates in Table 2.2 should not be used in direct comparison to provincial average rates on the corridor due to the small collision sample size over limited roadway length used in the calculation.

Table 2.2 - Ranked High Collision Rate Sections - ND Lea November 2006 Phase 1 Report

Overall Rank	Segment	Collisions Location km		Location	Highest Collision Density km		Collision Rate	High Severity Rate
		From	To		From	To		
1	910	13.0	14.6	Tank Hill	13.2	14.1	2.96	1.25
2	905	10.9	14.5	Camper's Roost	11.7	12.6	2.90	1.57
3	917	3.7	4.6	Cache Creek	3.7	4.6	2.41	1.07
4	905	2.6	8.2	American Creek Area	3.0	3.9	2.05	1.20
5	905	102.6	104.4	Skuppa Rest Area	102.7	103.6	2.03	1.09
6	915	20.8	22.6	Oregon Jack Pit	21.0	21.9	2.00	1.07
7	905	23.6	25.5	Downtown Yale	24.1	25.0	1.93	1.09
8	905	15.8	17.4	Emory Creek Area	15.3	16.2	1.81	0.97
9	910	16.3	18.0	Nicomen Creek Area	16.8	17.7	1.71	1.25
10	905	27.3	28.8	Pullout Litter Barrel - Bell Crossing	27.7	28.6	1.45	0.84
11	910	5.0	6.0	Old Road Access	5.0	6.0	1.09	0.78
12	915	38.1	39.0	Junction S End of Ashcroft Loop	38.1	39.0	1.07	0.77
13	905	52.4	53.6	Ferrabee Tunnel and Retaining Wall	52.4	53.5	1.06	0.75

Further screening was undertaken by ND Lea to identify and rank areas with the highest concentration of truck-involved collisions. The results are shown in Table 2.3.

Table 2.3 - Ranked TRUCK-INVOLVED High Collision Rate Sections

Overall Rank	Segment	Collisions Location km		Location	Highest Collision Density (TRUCKS) km		TRUCK Collision Rate
		From	To		From	To	
1*	910	13.0	14.6	Tank Hill (& Snake Pit)*	13.0	14.6	0.77
2*	915	13.0	16.0	Kingsway Curves*+	14.4	15.9	0.75
3*	905	92.9	95.2	Kanaka Bar*+	92.9	95.2	0.75
4	905	15.8	17.4	Emory Creek Area	15.8	17.4	0.63
5*	905	102.6	104.4	Skuppa Rest Area*	102.9	103.5	0.63
6	905	98.3	100.1	Siska Access +	98.3	100.1	0.63
7*	910	16.3	19.5	Nicomen Creek* (& Marshall Mountain Curves +)	16.3	19.5	0.58
8	905	2.6	8.2	American Creek Area	3.1	8.2	0.49

Locations identified with an 'asterisk' (*) above coincide with those identified by the BCTA, earlier in 2006, as a concern. Those with an (+) symbol indicate locations not previously identified in Table 2.2, but considered significant in terms of truck-involved collisions.

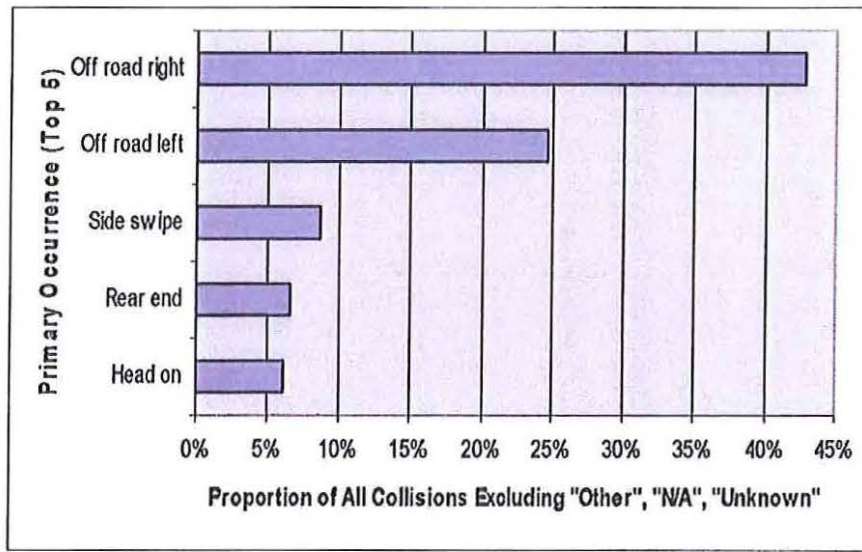
Other locations, also identified by the BCTA but with lower truck collision rates (TCR) are as follows:

- LKI 905, km 27-29 Bell Crossing (TCR = 0.064)
- LKI 905, km 30-35 CP Corners (TCR = 0.201)
- LKI 905, km 47.7-53.5 Curves Tunnels (Alexandra to Ferrabee – TCR = 0.267)
- LKI 915, km 21.8-22.7 Oregon Jack (TCR = 0.225)

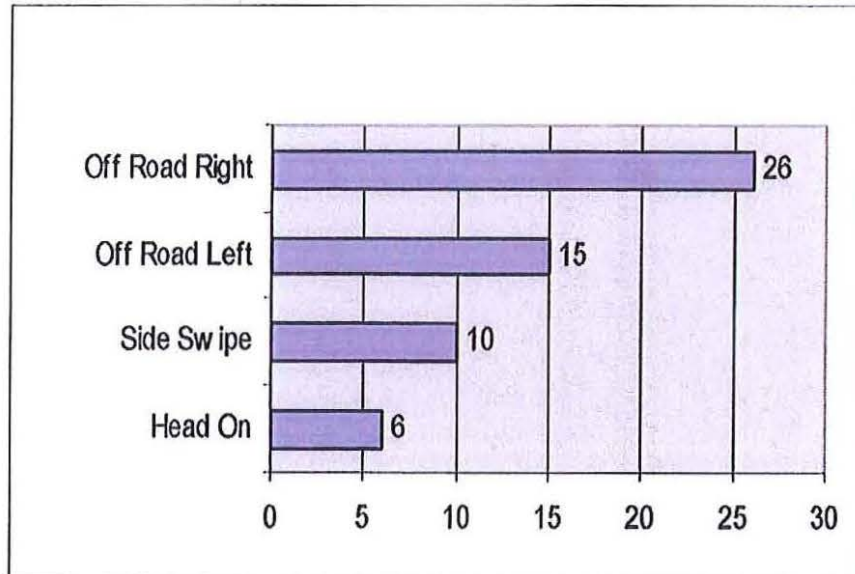
Primary Occurrences – Figure 2.1 shows percentage representation of the top primary occurrences for collisions that have occurred over the entire length of the corridor accounting for all vehicle types and for truck-involved only. Noted, the proportions are similar in each case.

Figure 2.1: Primary Occurrences

All Collisions (ND Lea) – shown as a percentage of ALL vehicles



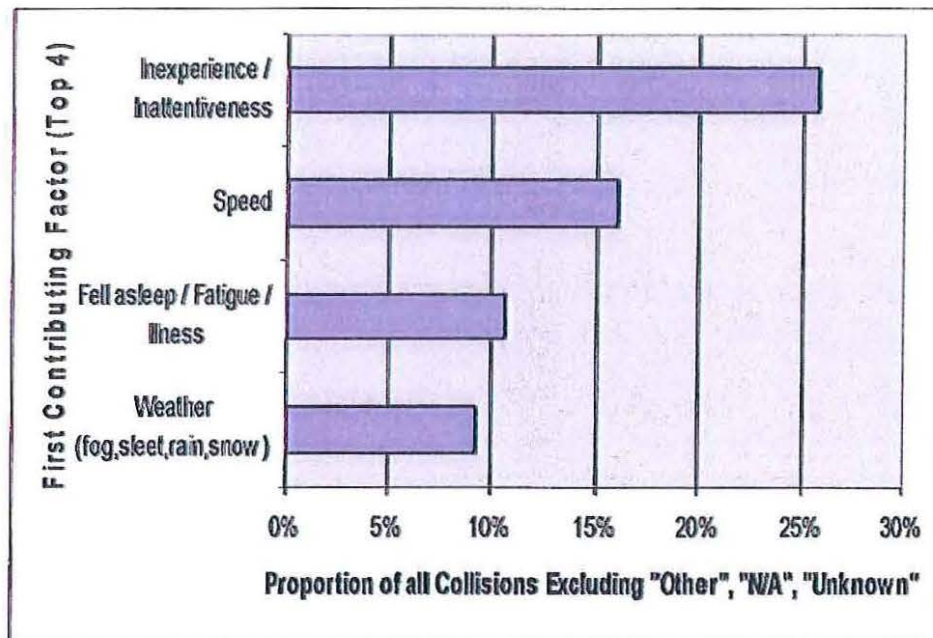
Truck-Involved Collisions – shown as a percentage of TRUCKS ONLY



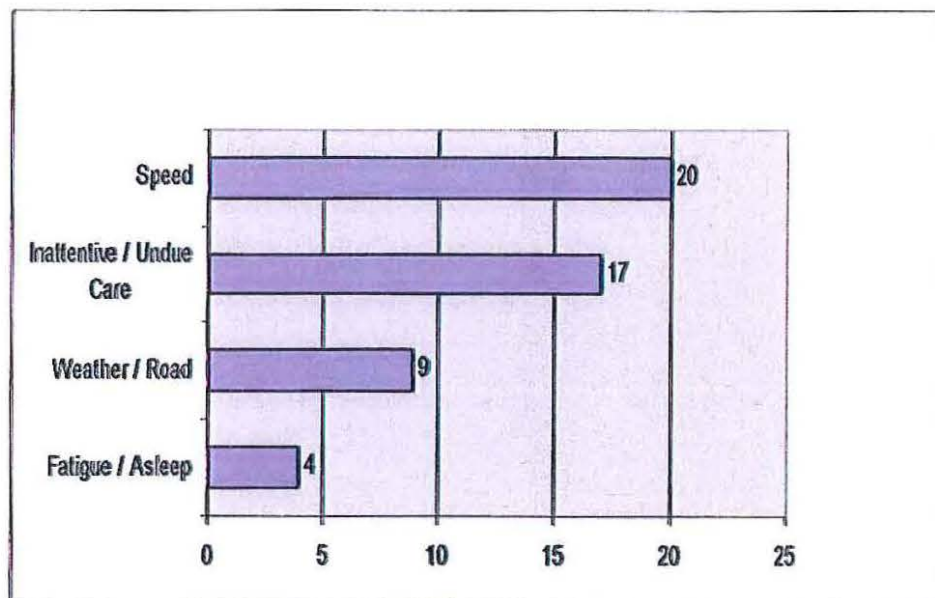
First Contributing Factors - Figure 2.2 shows percentage representation of the top primary occurrences for collisions that have occurred over the entire length of the corridor accounting for all vehicle types and for truck-involved only. Note that speed has a higher profile for truck-involved collisions.

Figure 2.2 First Contributing Factor

All Collisions (ND Lea) – shown as a percentage of ALL vehicles

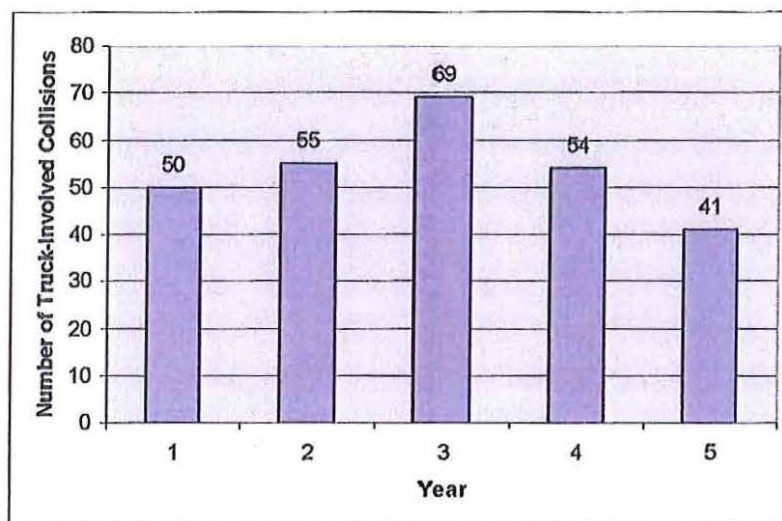


Truck-Involved Collisions – shown as a percentage of TRUCKS ONLY



Annual Trends – Figure 2.3 shows the number of truck-involved collisions per year between 2001 and 2005. Note the recent steady decline in collisions since 2003 of approximately 20% per year.

Figure 2.3 Number of Truck-Involved Collisions (per year)



The declines in truck-involved collisions correspond with increased RCMP and CVSE presence/efforts on this section of highway since 2003. Recent delineation improvements have also had some influence in the declining number of collisions.

In 2004 improvements to roadside delineators on Highway 1 between Hope and Ashcroft were completed. The project included the upgrade of existing and new delineators to meet ASTM Level 9 standard (3M - diamond grade) at all curves with speed advisory warning signs. ICBC funded \$180,000 of the project cost. Over 300 post mounted delineators and chevron signs were replaced. Over 3400 new telspar mounted, CRB mounted and chevron signs were installed.

In August 2005 centerline rumble strips were installed on Highway 1 between Hope and points beyond (north and east of) Cache Creek. The Ministry of Transportation funded this project; estimated cost on the Hope to Cache Creek section was approximately \$100,000.

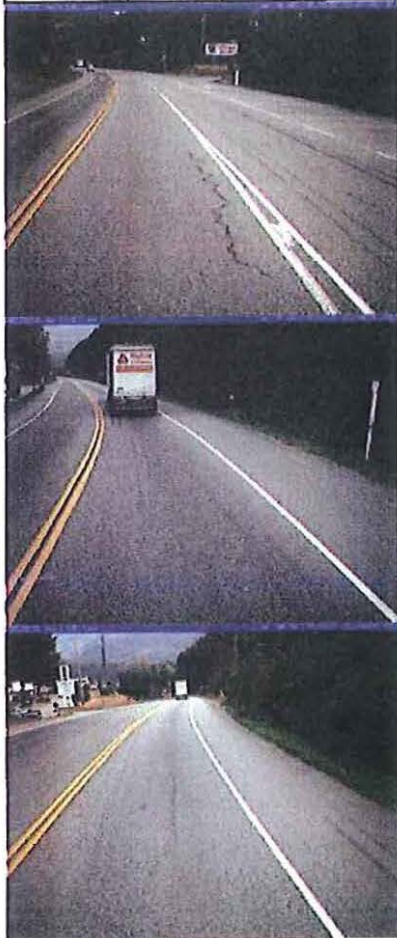
2.0 TRUCK-INVOLVED High Collision Rate Sections

The locations identified in Table 2.3 were further investigated in more detail to better understand site specific circumstances and corridor wide trends. It is important to recognize the limitations of information from the HAS database (2001-2005) detailed reports, which on a site specific basis involve small sample sizes and error in terms of location coding. This approach, along with further site visits and input from local Ministry staff were considered in the interpretation of each location.

3.1 American Creek Area (Segment 905, km 3.1 to 8.2)

The American Creek area, identified as 8th highest truck-involved collision rate on the corridor, was defined as the Highway 1 section in the vicinity of the Highway 1 / Highway 7 Junction Ramps to the south end of American Creek Bridge.

Figure 3.1 Collision History 2001-2005				
Year	Fatal	Injury	PDO	Total
All				
2001	0	2	2	4
2002	0	6	2	8
2003	0	8	7	15
2004	1	8	4	13
2005	2	3	5	10
			Total	50
Trucks				
2001	0	0	0	0
2002	0	0	1	1
2003	0	6	3	9
2004	1	4	1	6
2005	0	2	2	4
			Total	20



- Figure 3.1 shows the history where 20 of the 50 collisions were truck-involved. Consistent with the overall corridor, collisions have declined since 2003.
- The first photo on the left was taken at km 3.5 near end of the eastbound on ramp where Hwy 1 and 7 merge (Ross Road can be seen a short distance ahead to the right). Nearly half (8 out of 20) of the truck collisions occurred in this vicinity (km 3.1 to 4.5)
- The 2nd and 3rd photos on the left were taken adjacent of the Lake of the Woods Rest Area and the Cariboo Motel access. Half (10 out of 20) of the truck collisions occurred in this vicinity and American Creek Road access (km 4.9 to 7.6).
- 33% of truck collisions were off road rights and lefts; head on, side swipes and rear end represent 6% each.
- First contributing factors are broadly varied, although unsafe speed (21%), driver inattentive/impaired (16%), avoidance movements, tire failure, insecure load, weather and wildlife (6% each) all predominant.
- The relative location of the Ross Road intersection with the Highway 1 / Highway 7 Junction ramps is closely spaced and may affect the functionality in this area.
- Access and parking management in the Lake of the Woods some cause for concern as this area is a popular stopping/parking area (often involving parking on the highway shoulder) conflicting with high speed vehicles (due to northbound and southbound climbing lanes merging at either end of this 2 lane section).

3.2 Emory Creek Area (LKI Segment 905, km 16.2 to 17.1)

The Emory Creek area located just south of the Emory Creek Bridge (LKI 17.1 is the south end of the bridge) was identified as collision prone and the 4th highest truck collision rate on the corridor.

Figure 3.2 Collision History 2001-2005				
Year	Fatal	Injury	PDO	Total
All				
2001	0	2	2	4
2002	0	2	2	4
2003	0	3	3	6
2004	0	1	1	2
2005	0	1	3	4
			Total	20
Trucks				
2001	0	1	1	2
2002	0	1	2	3
2003	0	2	1	3
2004	0	0	0	0
2005	0	0	2	2
			Total	10

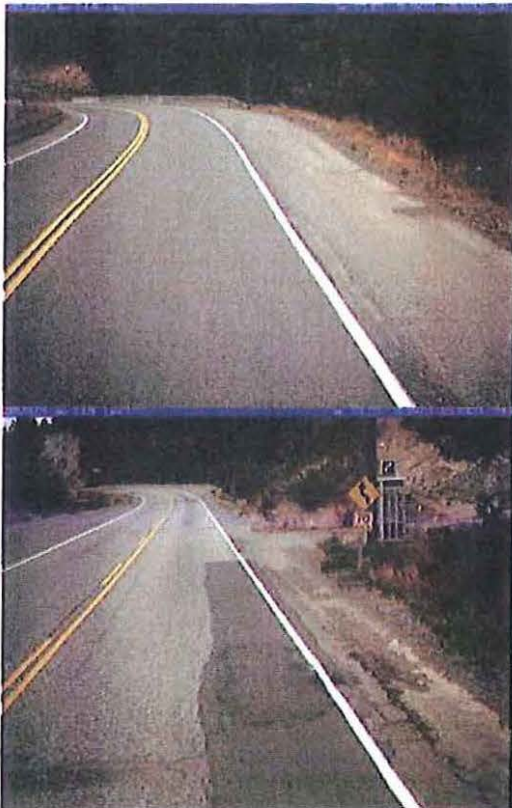


- Figure 3.2 shows the history where 10 of the 20 collisions were truck-involved. Collisions appear to have declined only slightly since 2003.
- The photo on the left was taken just south of the Emory Road intersection (km 17.0) and the Emory Creek Bridge (km 17.1), where 7 of the 10 truck collisions have occurred in this vicinity.
- The majority of truck crashes (55%) were off road to the right (both directions), with a large percentage (55%) related to speed and driver undue care, or falling asleep; 18% percent related to weather and wildlife. All of these collisions occurred between November and early April.
- Although only 1 collision involved another vehicle, the proximity and visibility of the Emory Road intersection is a concern. The photo indicates recent removal of adjacent foliage to improve visibility, as an interim measure.
- Another potential concern is the roadway super-elevation on west approach to the Emory Creek Bridge relative to the alignment of the bridge deck surface.

3.3 Kanaka Bar (Segment 905 km 92.9 to 95.2)

The Kanaka Bar area was identified as the 3rd highest truck collision rate on the corridor, defined by the section between the Siwash Road intersection and the curves north of the Kanaka Bar Complex. The BC Trucking Association specifically identified the curves north of the Kanaka Bar Complex as a concern.

Figure 3.3 Collision History 2001-2005				
Year	Fatal	Injury	PDO	Total
All				
2001	0	3	3	6
2002	0	0	2	2
2003	0	1	4	5
2004	0	2	3	5
2005	0	1	3	4
			Total	22
Trucks				
2001	0	0	2	2
2002	0	0	0	0
2003	0	1	2	3
2004	0	1	2	3
2005	0	1	3	4
			Total	12

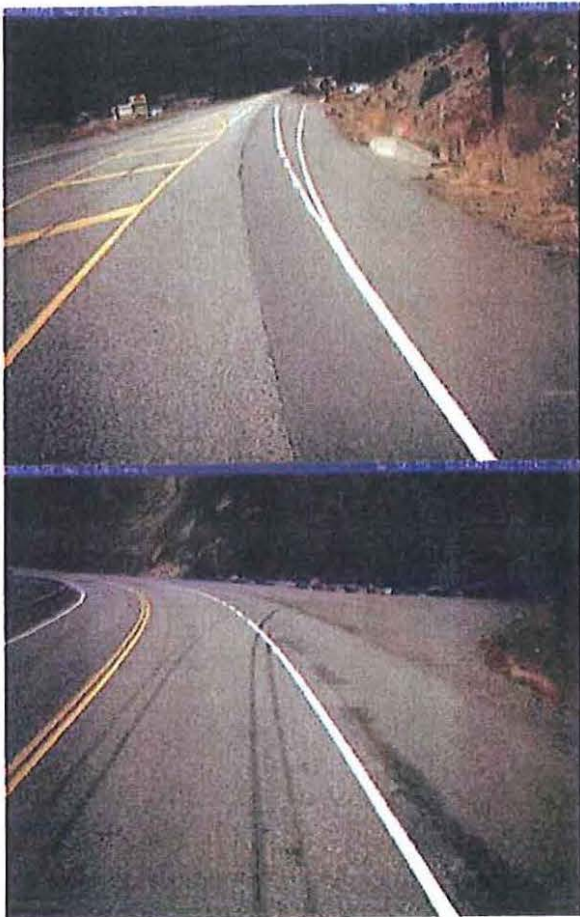


- Figure 3.3 shows the history where 12 of the 22 collisions were truck involved. Unlike trends elsewhere on the corridor, truck-involved collisions continue to increase recently.
- The first photo on the left was taken just south of Siwash Road (km 93.6) where 6 of the 12 truck collisions occurred. 2 collisions were southbound off road lefts with unspecified contributing factors. No intersection related collisions were identified. All others were related to a variety of contributing factors including unsafe speed, weather and alcohol. A single northbound head on collision was recorded in December 2005 (after the implementation of centerline rumble strips) and attributed to weather conditions.
- The second photo was taken just south of the Kanaka Bar north access showing curves to the north where 6 of the 12 truck collisions occurred. 5 collisions were northbound off road, 3 of these to the right with weather and speed identified as contributing factors. Note the existing paved shoulders are relatively narrow and inconsistent in width. cursory visual inspection suggests there may be some inconsistency super-elevation between curve and tangent.

3.4 Siska Area (LKI Segment 905, km 98.3 to 100.1)

The Siska area was identified as 6th highest truck collision rate on the corridor, defined by the section at the Siska Nation Access and curves to the north.

Figure 3.4 Collision History 2001-2005				
Year	Fatal	Injury	PDO	Total
All				
2001	0	1	1	2
2002	0	3	2	5
2003	0	0	1	1
2004	0	0	1	1
2005	0	0	1	1
			Total	10
Trucks				
2001	0	1	1	2
2002	0	3	1	4
2003	0	0	1	1
2004	0	0	1	1
2005	0	0	0	0
			Total	8



- Figure 3.4 shows the history where 8 of the 10 collisions in this area were truck involved. Consistent with overall trends on the corridor, a significant decline in the number of truck collisions since 2002.
- 25% of the truck collisions were off road and 25% were side swipe.
- 50% of the truck collisions were speed related; others were related to avoidance of other vehicles and alcohol.
- The first photo on the left was taken looking northbound, (approximately km 98.0) just south of Siska Access. Through this area, 2 of the 8 truck collisions occurred (2001 and 2002); both speed related not specified as intersection related.
- The second photo was taken looking northbound, (approximately km 99.4), where 6 of the 8 truck collisions occurred here and within the next 600m to the north; including the side swipes (2002).
- The data indicates the Highway 1 'Delineation and Centre line Rumble Strip Project have had an influence on truck safety in this area.
- Noted, the remaining inconsistencies in paved shoulder width and off set distances between lane edge and road side.

3.5 Skuppa Rest Area (LKI Segment 905, km 102.9 to 103.5)

The Skuppa Rest Area was identified as 5th highest truck collision rate on the corridor.

Figure 3.5 Collision History 2001-2005				
Year	Fatal	Injury	PDO	Total
All				
2001	0	4	0	4
2002	1	2	1	4
2003	0	0	3	3
2004	0	1	0	1
2005	0	0	0	0
			Total	12
Trucks				
2001	0	3	0	3
2002	1	1	1	3
2003	0	0	1	1
2004	0	1	0	1
2005	0	0	0	0
			Total	8



- The Skuppa Rest Area (km 013.5) is shown on the photo to the left looking northbound. Here, 7 of the 8 truck collisions were southbound direction off road left or other; all were speed related with exception of 1 insecure load.
- Figure 3.5 shows the history where 8 of the 12 collisions were truck-involved. Note the number of truck-involved collisions has significantly declined since 2002. The last collision, shown, occurred in May 2004.
- This dramatic trend is attributed to recent roadway improvements implemented in the spring of 2004 including the removal of a passing zone and the re-profiling the roadway cross section to address inconsistencies in super-elevation on the curve at the rest area.

3.6 Tank Hill (LKI Segment 905, km 12.6 to 13.8)

The Tank Hill area including the CPR Underpass and the highway section to the north known as the 'Snake Pit' was identified as collision prone and as having the highest overall truck collision rate on the corridor.

Figure 3.6 Collision History 001-2005				
Year	Fatal	Injury	PDO	Total
All				
2001	0	2	0	2
2002	0	1	2	3
2003	1	0	5	6
2004	0	2	5	7
2005	0	1	2	3
			Total	21
Trucks				
2001	0	0	0	0
2002	0	0	0	0
2003	1	0	2	3
2004	0	2	4	6
2005	0	0	0	0
			Total	9

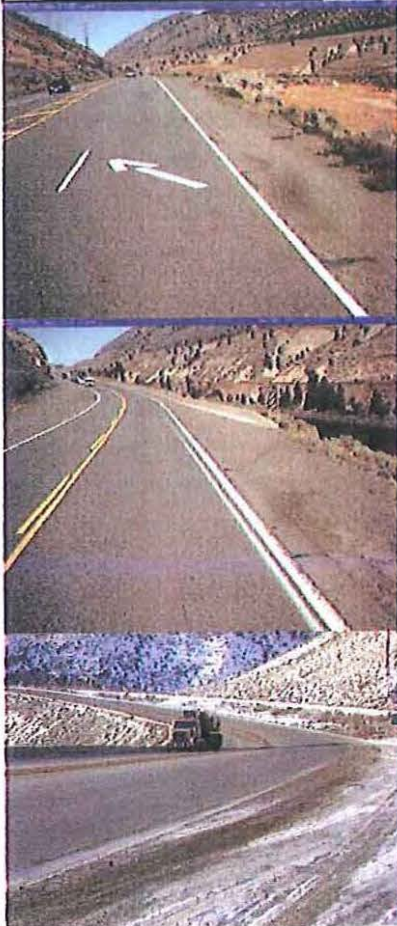


- Figure 3.6 shows the history where 9 of the 21 collisions were truck-involved. Oddly, all collisions recorded in this dataset occurred during 2003 and 2004 (none later than Sept 2004).
- 66% of truck collisions in this area were either head-on, side swipe or off road; which consistent with road geometry and features in this area.
- 56% of truck collisions had first contributing factor related to speed and/or undue care.
- The first photo on the left was taken approaching the CPR Underpass at km 13.3 where 3 of the 9 truck collisions were near.
- The second photo was taken just north of the CPR underpass entering the 'Snake Pit' where 6 of the 9 truck collisions were located. 4 of these collisions were southbound and speed related, including a head on fatal in 2003.
- The data suggests the Highway 1 'Delineation and Centre line Rumble Strip Project have significantly influenced truck safety for the better at the CPR underpass and Snake Pit area.
- Another concern raised, was the west grade approaching the near the top of tank hill, as shown in the 3rd photo on the left. The data shows only 3 truck-involved collisions have occurred in the last 5 years, all of these were in 2001 (side swipe and off road). It has been noted that the condition and consistency of the paved road shoulders, as well as back-to-back reverse curve super-elevation should be investigated and improved as necessary.

3.8 Kingsway Curves (LKI Segment 915, km 13.0 to 16.0)

The Kingsway Curves area was identified as 2nd highest on the corridor in terms of truck collision rate.

Figure 3.8 Collision History 2001-2005				
Year	Fatal	Injury	PDO	Total
All				
2001	0	0	2	2
2002	0	1	2	3
2003	0	2	2	4
2004	1	4	5	10
2005	0	2	2	4
			Total	23
Trucks				
2001	0	0	2	2
2002	0	0	1	1
2003	0	1	1	2
2004	0	3	2	5
2005	0	1	2	3
			Total	13



- Figure 3.8 shows the history where 13 of the 23 collisions were truck-involved. Noted, there has been somewhat of a decline in the number of truck collisions since 2003.
- Primary Occurrences - 30% of truck collisions were off road rights. The remainder were distributed with no further discernable pattern.
- Key Contributing Factors – Speed was predominant contributing factor at 30%, while others were distributed among a variety of causes such as loss of control, cutting in, obstruction on the road, avoidance movements, insecure load and alcohol.
- The first and second photos on the left show km 15.5 and 15.8 respectively, where 7 of the 13 truck collisions have occurred. 3 of these were specifically southbound off road right at the location shown in the second photo. (The most recent of these was in December 2005 and was attributed to a combination of speed and weather conditions). One other was defined as a side swipe near the location of the first photo.
- The remainder of truck collisions in the Kingsway Curves area were distributed without specific concentration and indicated no specific dominant pattern.
- The third photo on the left is looking southbound at km 13.0. Some concern was raised in terms of an inconsistency of roadway super-elevation. The data identified only 1 truck-involved collision; southbound in August 2005, but no other information was available.

5.0 Corridor Safety Improvements

5.1 Context

Site specific review of the locations in Section 3 and 4 of this report confirm the general corridor trend findings in Tables 2.1 and 2.2 that the predominant primary occurrences for truck-involved collisions are off road, side swipe and head on. Furthermore, human factors such as speed, driver inattention/undue care are key contributing factors in the majority of these collisions.

Another trend since 2003, identified in Figures 2.3 is the significant decline in number of truck-involved collisions at most of the locations reviewed, including Tank Hill / Snake Pit, Kingsway Curves, Skuppa Rest Area, Siska Area, Nicomen Creek / Marshall Mountain, American Creek, Bell Crossing, CP Corners and Oregon Jack.

Note, there has been minimal, or no decline in the number of truck-involved collisions at Emory Creek, Kanaka Bar and at the Curved tunnels (Alexandra and Ferrabee).

Limited available funding must be effectively allocated to improvement projects throughout the province to ensure investments provide maximum benefits to society and the overall provincial economy. Therefore, the effectiveness of safety improvement plans/strategies must consider, feasibility, affordability and, most importantly, be focused on actions having the greatest potential to prevent/minimize collisions.

Mountainous terrain and features such as high slopes, rock faces, tunnels and railway tracks and underpasses are significant challenges and constraint. Major improvements would come at a high (likely prohibitive) cost.

The relationship between the driver and the roadway is an important consideration for highway safety. Without definitive, formal roadway delineation, drivers tend to seek other, subliminal roadside clues (such as trees, poles, terrain) to assess the roadway ahead. Information providing clear messaging and positive guidance can enhance the driver's expectations on the roadway ahead, in order to make the appropriate decisions accordingly.

At the same time, it is important to recognize that road improvements alone will not directly address driver behavior and attitudes.

The following highway improvement types are thematic for the entire corridor:

- Roadway geometry may be constrained, horizontally and physically, however, correction to inconsistencies (such as curves, dips, super-elevation and rutting) can reduce collisions between 40-60% having an affect on driver expectations and maintaining vehicle control. (Ogden 1996 - Safer Roads: A guide to Road Safety Engineering).
- Delineation improvements can reduce collisions between 10 and 40% (Ogden 1996). Examples include the provision of consistent clues and guidance to the driver such as, uniform paved shoulder widths and off set distances from lane edge and road side barrier, visible pavement markings at lane edge and centerline, centerline and shoulder strips and well placed, functioning (clean) roadside reflectors.

- Warning signage improvements can reduce collisions between 20 and 40% (Ogden 1996). Examples include consistent and accurate messaging of the changing or unique roadway condition ahead, such as curve advisories, grades, etc.
- Intersection and Access Management, including defined access points and channelized turning lanes can reduce collisions between 20-40% (Ogden 1996).

5.2 Improvement Strategy

Table 5.1 provides a summary of location specific safety improvements as presented to the Fraser Canyon Truck Crash Review Committee (FCTCRC) on February 16, 2007.

Table 5.1 – Location Specific Safety Improvements

Overall Rank	Location	Planned Improvements	
		2007	Future
1*	Tank Hill (& Snake Pit)	Warning Signage, Roadside Reflectors	Shoulders and Super-elevation
2*	Kingsway Curves	Warning Signage, Shoulders and Super-elevation	As necessary.... Shoulders & Super-elevation
3*	Kanaka Bar	Warning Signage, Roadside Reflectors, Shoulders and Super-elevation	
4	Emory Creek Area	Roadside Reflectors, Intersection, Super-elevation	As necessary.... Intersection, Shoulders & Super-elevation
5*	Skuppa Rest Area	Warning Signage	
6	Siska Access	Warning Signage, Shoulders	
7*	Nicomien Creek (& Marshall Mountain Curves)	Warning Signage, Roadside Reflectors	Shoulders and Super-elevation
8	American Creek Area	Warning Signage	Intersection
*	Bell Crossing	Warning Signage	
*	CP Corners	Warning Signage	
*	Tunnels	Warning Signage	
*	Oregon Jack	Warning Signage, Roadside Barrier	

Warning Signage & Roadside Reflectors

Warning signage and roadside reflectors to an ASTM 9 (diamond grade – 3M) standard of reflectivity should be upgraded for the entire corridor. The review should investigate and confirm speed zones (for consistency) and where necessary curve testing and reconfiguration or relocation of warning signage.

Further roadside reflector improvements specifically in the Emory Creek, Tank Hill, Snake Pit and Nicomen Creek areas are to be included in the work.

Message to FCTCRC - In 2007, the Ministry is prepared to contribute \$300,000 (\$150,000 from each region) for this work, to be coordinated between South Coast and Southern Interior Regions and ICBC; to be completed by the fall. There may be an opportunity to cost share with ICBC. All locations will benefit from the upgrade warning signage including Bell Crossing, CP Corners and Tunnels, which will continue to be monitored.

Kingsway Area

Further engineering and project development are needed to address road shoulders and super-elevation in the Kingsway Curves area.

Message to FCTCRC - In 2007, the Ministry plans to contribute between \$50,000 and \$350,000 to begin project development (survey and engineering) for improvements. Depending on the requirements and the cost, reconstruction may proceed in 2007, or as necessary be completed in subsequent years.

Kanaka Bar to Siska to Skuppa

Improvements are needed to remove inconsistencies in super-elevation as well a consistent paved shoulder width (where possible) and of set distances to road side barrier.

Message to FCTCRC - In 2007, the Ministry is planning to invest \$2.7M in resurfacing for 9km of Highway 1, Kanaka Bar to Skuppa Rest area. This work includes an approximate value of \$320,000 directed toward attaining uniform paved shoulder widths of 1.5m (and off set distances of 1.5m from lane edge and road side barrier). Also renewal of centerline and shoulder rumble strips, new pavement markings and new reflectors on road side barriers included. Special attention to be applied at curves in the Kanaka Bar and Siska areas. This project will also pave the pullouts at the Kanaka Bar avalanche gates to provide effective parking storage and turn around area.

Emory Creek Area

Sight distance improvements at Emory Creek Road are needed. The Ministry is currently redesigning the Emory Road intersection to be relocated 30m to the west to improve stopping (highway traffic) and turning (side road traffic) sight distance in this area. In order to add turning lanes on the existing highway some reconstruction will be involved, therefore the roadway super-elevation on the south approach to the Emory Creek Bridge should also be investigated and corrected as necessary.

Message to FCTCRC - In 2007, the Ministry is prepared to contribute funding (\$150,000) toward the development of this project. Future year funding is expected necessary to complete property acquisition and construction.

Nicomen Creek and Marshall Mountain

In addition to the warning signage and reflector upgrades planned for 2007, further improvements to delineation and positive guidance will be beneficial.

Future resurfacing projects between Skuppa Rest Area and Ashcroft should address inconsistencies in super-elevation as well as a consistent paved shoulder width (where possible) and off set distances to road side barrier, in these areas as well as at Tank Hill.

'Speed Sentry' (ITS) technology has been proposed by others for the southbound approach to the Nicomen Creek area. A similar device ITS application is currently being developed, as a pilot project on the southbound approach to the Fraser River Bridge.

Message to FCTCRC - Further investigation is needed on the cost and effectiveness of this technology. Preliminary investigation in 2006 (Urban Systems for Marshall Mountain) suggested costs in the \$600,000 range, although rapid advances in technology may offer reduced costs. Until more information is available, it is recommended to apply available funding to provide a safety benefit to broader sections of the corridor. Meanwhile, the Nicomen Creek and Marshall Mountain area will continue to be monitored, as future resurfacing improvements will also address super-elevation, shouldering and roadside barrier (where feasible).

American Creek Area

Message to FCTCRC - The Ministry will continue efforts to develop a partnership with First Nations and the District of Hope to relocate the Ross Road intersection, approximately 120m to the east. The improvement will include turning lanes and increased spacing from the Highway 1 / Highway 7 Junction Ramps.

Message to FCTCRC - The Ministry will continue to work with the Regional District to resolve access and parking issues in the Lake of the Woods Rest area; a publicly sensitive issue. Options such as the prohibition of parking along the highway shoulder and/or limiting access (left turns) will expectedly meet with public criticism.

Oregon Jack

The Ministry has been replacing deteriorating roadside barrier units, including the related widening of paved shoulders to obtain consistent offsets between the barrier and lane edge, on the 18km section to the south of Venables Valley Road. This has been a multi-year project with approximately \$1.19M already invested over the past 3 years.

Message to FCTCRC - In 2007, the Ministry will continue with the roadside barrier (guardrail) project, investing another \$375,000 to complete the section.

Ministry of Transportation

Highway 1, Hope to Cache Creek Safety Assessment

PHASE 2 - RECOMMENDED IMPROVEMENTS



Ministry of Transportation
South Coast and Southern Interior Region
Prepared By: Grant M. Irvine, P. Eng. Senior Transportation Planning Engineer
February 2007

Bonhomme, Korry TRAN:EX

From: s.22
Sent: Tuesday, September 27, 2011 6:44 PM
To: Hazlewood, Anne TRAN:EX
Subject: Re: RE: Fraser Canyon Danger - Passing Lane/Turning Lane

Thanks very much, Cory, and I also appreciated your time for our chat back in July.

Hope your work goes well - thanks again.

s.22

----- Original Message -----

From: "Hazlewood, Anne TRAN:EX" <Anne.Hazlewood@gov.bc.ca>
Date: Tuesday, September 27, 2011 9:09 am
Subject: RE: Fraser Canyon Danger - Passing Lane/Turning Lane
To: s.22
Cc: "Malik, Naasir TRAN:EX" <Naasir.Malik@gov.bc.ca>, "Chhun, Thomas TRAN:EX" <Thomas.Chhun@gov.bc.ca>, "Khattak, Umar TRAN:EX" <Umar.Khattak@gov.bc.ca>

> Thank you for getting back to us with this. It just so happens
> that I will be going north to that area with a traffic
> engineer in the near future. We will look at all our options for
> this turn. The separated line does legally give traffic
> permission to turn, however we do have several enhanced safety
> options that may make the turn safer. Again, thank you for your
> continued attention and correspondence.

> Sincerely,
> Cory Lawton
> A/Area Manager
> Hope BC
> 604-869-7328

>
> From: s.22
> Sent: Saturday, September 24, 2011 6:53 PM
> To: Grunberg, Brad J TRAN:EX
> Cc: Hazlewood, Anne TRAN:EX; Lawton, Cory TRAN:EX
> Subject: Re: Fraser Canyon Danger - Passing Lane/Turning Lane

> Hello Brad, Anne and Cory:

> s.22

> s.22
> When you drive towards it from
> the south, I recall today it came up fairly quickly after a
> corner. The solid line has a break so I guess that turning
> left is allowed -- ?? But I still consider it dangerous

> based on my own experience, one of the scariest ever driving.
>
> Thanks for your attention to this - I appreciate your concern.
>
> s.22
> ----- Original Message -----
> From: Grunberg, Brad J TRAN:EX<mailto:Brad.Grunberg@gov.bc.ca>
> To: s.22
> Cc: Hazlewood, Anne TRAN:EX<mailto:Anne.Hazlewood@gov.bc.ca>
> ; Lawton, Cory TRAN:EX<mailto:Cory.Lawton@gov.bc.ca>
> Sent: Monday, July 25, 2011 11:16 AM
> Subject: RE: Fraser Canyon Danger - Passing Lane/Turning Lane
>
> Deal s.22
>
> Thank you for your email regarding the Fraser Canyon.
>
> I have passed this on to our Area Manager for the area Anne
> Hazelwood for discussion with our Traffic Engineer. You
> should be hearing from Anne in the near future. Anne can
> be reached at 604 869 7328.
>
> If you have any further questions please give me a call.
>
> Regards,
>
>
> Brad Grunberg
> A/Operations Manager
> Phone: 604 795 8201
> Fax:604 795 8214
>
>
>
>
>
>
> From: s.22
> Sent: Monday, July 25, 2011 10:15 AM
> To: Grunberg, Brad J TRAN:EX
> Subject: Fraser Canyon Danger - Passing Lane/Turning Lane
>
>
> Dear Brad:
>
> Before I explain my situation, please forward this email if you
> are not the correct recipient - thank you.
>
> I'd like to point out a dangerous situation on Highway 1 that I
> believe merits attention by the Ministry of Transportation and
> Infrastructure. s.22

> s.22

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> I feel that MOTI should do the following - please:

>

> 1. Install signs preventing left turns from the

> passing lane.

> 2. Individually notify residents that this practice

> is totally unsafe and if there are vehicles behind to proceed to

> the next safe place to turn off to the right and then turn

> around and come back.

> Please let me know that you received my email. Thanks for

> listening.

> Sincerely,

>
> s.22
>
>
>
>
>



File: 21050-40/1C

February 1, 2012

Lloyd Forman, Director
Electoral Area A
Fraser Valley Regional District
#1 - 45950 Cheam Avenue
Chilliwack BC V2P 1N6

FILE COPY

Dear Mr. Forman:

RE: Safety Issue – Highway 1 and Slanzi Road/Canyon Alpine, Boston Bar

Thank you for your letter of December 14, 2011 expressing safety concerns at Highway 1 and Slanzi Road in the Boston Bar area. Please accept my apologies for the delay in my response.

The safety of the traveling public is one of the Ministry's highest priorities and I appreciate you bringing this concern to my attention. I have asked our engineers to review the operations of the intersection noted above. Once completed, I would be happy to discuss the results of the analysis with yourself.

If you have any further questions feel free to contact me at 604-660-8300 or by email at Thomas.Chhun@gov.bc.ca.

Regards,

Thomas Chhun

Operations Manager – Chilliwack Area Office

cc: Jessie Bains, Operations Manager
Naasir Malik, District Engineer, New Westminster
Anne Hazlewood, Area Manager, Hope

Ministry of
Transportation and
Infrastructure

Lower Mainland District
Chilliwack Area Office

Mailing Address:
45890 Victoria Avenue
Chilliwack BC V2P 2T1

Telephone: (604)795-8211
Facsimile: (604)795-8214

Web Address:
www.gov.bc.ca/tran



FRASER VALLEY REGIONAL DISTRICT

45950 Cheam Avenue, Chilliwack, British Columbia V2P 1N6

Phone: 604-702-5000

Toll Free: 1-800-528-0061 (BC only)

Fax: 604-792-9684

website: www.fvrd.bc.ca

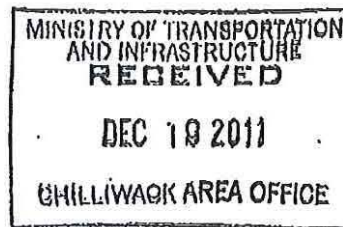
e-mail: info@fvrd.bc.ca

Office of the Director for Electoral Area A (Boston Bar/North Bend/Canyon Alpine)

December 14, 2011

File: 0410-20/MoTI

Thomas Chhun, Operations Manager
Ministry of Highways and Infrastructure (MoTI)
Chilliwack Area
45890 Victoria Avenue
Chilliwack BC V2P 2T1



Dear Mr. Chhun:

Re: Safety Issue - Highway 1 Slanzi Road/Canyon Alpine, Boston Bar

As the elected representative for the Boston Bar/North Bend/Canyon Alpine area of the Fraser Valley Regional District, I am writing to express my concern with respect to a safety issue on Highway 1, in the Boston Bar area.

On November 12th there was a near fatal, serious multi-vehicle accident on Highway 1 at Slanzi Road and Canyon Alpine which was caused by a vehicle turning left from the fast lane onto a side road. I would implore you to install a left turn lane at Slanzi Road, an exit lane into Canyon Alpine, and an on-ramp lane southbound from Slanzi Road onto Highway #1.

Given the volume of traffic in this area and winter driving conditions, I would appreciate your review of this issue at your very earliest opportunity, and a response as to the remediation steps you will be taking in the future to address this situation.

Thank you for your consideration of this urgent matter as it is only a matter of time before a fatality does occur at this location.

Yours very truly,

Lloyd Forman, Director, Electoral Area A

cc: Howard Johnson, Boston Bar Ambulance Service

Bonhomme, Korry TRAN:EX

From: Hazlewood, Anne TRAN:EX
Sent: Wednesday, June 19, 2013 10:47 AM
To: Malik, Naasir TRAN:EX; Bains, Jessie TRAN:EX
Cc: Kelly, Mike TRAN:EX
Subject: FW: Highway 1 @ Slanzi Road
Attachments: 20130619101542.pdf; Re: RE: Fraser Canyon Danger - Passing Lane/Turning Lane; RE: Hwy 1 at Slanzi Road (Canyon Alpine) in Boston Bar; Hwy 1 at Slanzi Road (Canyon Alpine) in Boston Bar

Sorry Guys^{s.22}

Anyway, I have received another request for a review of the Hwy 1/Slanzi Rd intersection. This time it is a request for signs.

Could we please have the engineering group take a look at this location and come up with a proposal/possible solution?

Thanks,

*Anne Hazlewood
Area Manager
Ministry of Transportation and Infrastructure
South Coast Region
Hope Sub-Office
Office Ph. 604-869-7328*

^{s.17}

e-mail Anne.Hazlewood@gov.bc.ca

Bonhomme, Korry TRAN:EX

From: Hazlewood, Anne TRAN:EX
Sent: Wednesday, June 19, 2013 12:07 PM
To: Bains, Jessie TRAN:EX; Malik, Naasir TRAN:EX
Cc: Kelly, Mike TRAN:EX; Crichton, William H TRAN:EX
Subject: RE: Highway 1 @ Slanzi Road

Jessie,

Looks like yourself and Bill ? if you want him to attend also, are available and in Chwk next Thursday. How about 9:30am at my office?

Anne Hazlewood
Area Manager
Ministry of Transportation and Infrastructure
South Coast Region
Hope Sub-Office
Office Ph. 604-869-7328
Cell Ph. s.17
e-mail Anne.Hazlewood@gov.bc.ca

From: Bains, Jessie TRAN:EX
Sent: Wednesday, June 19, 2013 11:25 AM
To: Hazlewood, Anne TRAN:EX; Malik, Naasir TRAN:EX
Cc: Kelly, Mike TRAN:EX
Subject: RE: Highway 1 @ Slanzi Road

Anne, time for a site visit..... difficult to make out on Google Maps.

Jessie

From: Hazlewood, Anne TRAN:EX
Sent: Wednesday, June 19, 2013 10:47 AM
To: Malik, Naasir TRAN:EX; Bains, Jessie TRAN:EX
Cc: Kelly, Mike TRAN:EX
Subject: FW: Highway 1 @ Slanzi Road

Sorry Guys s.22

Anyway, I have received another request for a review of the Hwy 1/Slanzi Rd intersection. This time it is a request for signs.

Could we please have the engineering group take a look at this location and come up with a proposal/possible solution?

Thanks,

Anne Hazlewood
Area Manager
Ministry of Transportation and Infrastructure
South Coast Region
Hope Sub-Office

Office Ph. 604-869-7328

Cell Ph. s.17

e-mail Anne.Hazlewood@gov.bc.ca

Inventory Item Location Report

Sorted by Highway Number

Service Area: Fraser Valley SA

AMA: 07-C - Area C

Sub Area: 07-C-3 - Boston Bar

RFI Highway: 07-C-3-00001 TRANS CANADA E/B

RFI Length: 66.621

RFI Direction: E

<u>Inventory Item</u>	<u>Primary Key</u>	<u>XSP</u>	<u>Attributes</u>	<u>Chainage</u>		<u>Length</u>	<u>Modification</u>
				<u>Start</u>	<u>End</u>		
SIGN	1864746	LS	I-071-1 Pullout () 00 m Ahead East Wood 1 No	39.989	39.989		2010-06-22
SIGN	1864723	LS	I-117 Cariboo Gold Rush Trail marker East Wood 1 No	40.104	40.104		2010-06-22
SIGN	1864721	RS	PS-001 School Area Ahead symbol West Wood 1 No	40.140	40.140		2010-06-22
SIGN	1863954	LS	PS-002 Warning Diamond - Pedestrian Crosswalk Ahead symbol East Wood 2 No	40.178	40.178		2010-06-22
SIGN	1864088	RS	PS-001-TCX 50 km/h When Children on Highway tab West No Post 0 No	40.206	40.206		2010-06-22
SIGN	1864245	LS	R-004 Maximum POSTED SPEED () km/h East Wood 1 No	40.232	40.232		2010-06-22
SIGN	1864244	RS	R-004 Maximum POSTED SPEED () km/h West Wood 1 No	40.280	40.280		2010-06-22
SIGN	1863811	RS	G-035 Police West Wood 1 No	40.473	40.473		2010-06-22
SIGN	1864356	RS	G-011-TALR LEFT/RIGHT ARROW tab West No Post 0 No	40.473	40.473		2010-06-22
SIGN	1864765	LS	R-004 Maximum POSTED SPEED () km/h East Wood 1 No	40.661	40.661		2010-06-22
SIGN	1864869	LS	W-054-R Hazard marker - right East Telspar 1 No	40.675	40.675		2010-06-22
SIGN	1864868	LS	W-054-R Hazard marker - right East Telspar 1 No	40.701	40.701		2010-06-22
SIGN	1864345	RS	R-003 POSTED SPEED () km/h AHEAD ARROW West Wood 1 No	40.745	40.745		2010-06-22

Inventory Item Location Report

Sorted by Highway Number

Service Area: Fraser Valley SA

AMA: 07-C - Area C

Sub Area: 07-C-3 - Boston Bar

RFI Highway: 07-C-3-00001 TRANS CANADA E/B

RFI Length: 66.621

RFI Direction: E

Inventory Item	Primary Key	XSP	Attributes	Chainage		Length	Modification
				Start	End		
SIGN	1864720	LS	PS-001 School Area Ahead symbol East Wood 1 No	40.826	40.826		2010-06-22
SIGN	1864087	LS	PS-001-TCX 50 km/h When Children on Highway tab East No Post 0 No	40.826	40.826		2010-06-22
SIGN	1864538	RS	R-004 Maximum POSTED SPEED () km/h West Wood 1 No MAX 50KM/H	40.989	40.989		2010-06-22
SIGN	1864768	LS	R-004 Maximum POSTED SPEED () km/h East Wood 1 No MAX 60KM/H	40.994	40.994		2010-06-22
SIGN	1864082	RS	R-001-U STOP sign West Wood 2 No	41.056	41.056		2010-06-22
SIGN	1864412	RS	PS-002 Warning Diamond - Pedestrian Crosswalk Ahead symbol West Wood 1 No	41.086	41.086		2010-06-22
SIGN	1863809	RS	G-035 Police West No Post 0 No	41.163	41.163		2010-06-22
SIGN	1864355	RS	G-011-TALR LEFT/RIGHT ARROW tab West No Post 0 No	41.163	41.163		2010-06-22
SIGN	1864354	RS	G-011-TALR LEFT/RIGHT ARROW tab West No Post 0 No	41.163	41.163		2010-06-22
SIGN	1863810	RS	G-035 Police West Wood 1 No	41.163	41.163		2010-06-22
SIGN	1864532	RS	W-041-1 Slippery Surface symbol West No Post 0 No	41.211	41.211		2010-06-22
SIGN	1863746	LS	P-001 No Parking symbol DIRECTIONAL ARROW(S) North Metal 1 No RIGHT ARROW	41.403	41.403		2010-06-22
SIGN	1864259	LS	P-001 No Parking symbol DIRECTIONAL ARROW(S) North Metal 1 No DOUBLE ARROW	41.433	41.433		2010-06-22

Inventory Item Location Report

Sorted by Highway Number

Service Area: Fraser Valley SA

AMA: 07-C - Area C

Sub Area: 07-C-3 - Boston Bar

RFI Highway: 07-C-3-00001 TRANS CANADA E/B

RFI Length: 66.621

RFI Direction: E

Inventory Item	Primary Key	XSP	Attributes	Chainage		Length	Modification
				Start	End		
SIGN	1863959	LS	P-001 No Parking symbol DIRECTIONAL ARROW(S) North Metal 1 No LEFT ARROW	41.513	41.513		2010-06-22
SIGN	1864493	RS	G-104 () km Reference marker West Telspar 1 No 	41.599	41.599		2010-06-22
SIGN	1864085	LS	W-014 Checkerboard symbol South No Post 0 No C3-305	41.633	41.633		2010-06-22
SIGN	1864086	LS	W-014 Checkerboard symbol North Plastic 1 No C3-305	41.633	41.633		2010-06-22
SIGN	1864722	RS	I-117 Cariboo Gold Rush Trail marker West Wood 1 No 	41.774	41.774		2010-06-22
SIGN	1864411	LS	PS-002 Warning Diamond - Pedestrian Crosswalk Ahead symbol East Wood 1 No	41.809	41.809		2010-06-22
SIGN	1864537	LS	R-004 Maximum POSTED SPEED () km/h East Wood 1 No MAX 50KM/H	41.878	41.878		2010-06-22
SIGN	1863796	RS	R-004 Maximum POSTED SPEED () km/h West Wood 1 No MAX 90KM/H	41.890	41.890		2010-06-22
SIGN	1864363	LS	W-042 Falling Rocks symbol East Wood 1 No	41.951	41.951		2010-06-22
SIGN	1863920	RS	W-106 End Avalanche Area West Wood 1 No	41.972	41.972		2010-06-22
SIGN	1864380	RS	P-066-1 No Stopping symbol Avalanche Area West Wood 2 No	42.015	42.015		2010-06-22
SIGN	1863933	RS	P-066-T Next () km tab West No Post 0 No 3 KM	42.015	42.015		2010-06-22
SIGN	1864344	LS	R-003 POSTED SPEED () km/h AHEAD ARROW East Wood 1	42.129	42.129		2010-06-22

Inventory Item Location Report

Sorted by Highway Number

Service Area: Fraser Valley SA

AMA: 07-C - Area C

Sub Area: 07-C-3 - Boston Bar

RFI Highway: 07-C-3-00001 TRANS CANADA E/B

RFI Length: 66.621

RFI Direction: E

Inventory Item	Primary Key	XSP	Attributes	Chainage		Length	Modification
				Start	End		
			No MAX 50KM/H AHEAD				
SIGN	1864867	LS	W-054-R Hazard marker - right East Telspar 1 No	42.429	42.429		2010-06-22
SIGN	1864866	RS	W-054-R Hazard marker - right West Telspar 1 No	42.591	42.591		2010-06-22
SIGN	1864733	RS	I-082-1 Passing Lane () km Ahead West Wood 1 No	42.822	42.822		2010-06-22
SIGN	1864865	LS	W-054-R Hazard marker - right East Telspar 1 No	42.843	42.843		2010-06-22
SIGN	1864864	RS	W-054-R Hazard marker - right West Telspar 1 No	42.877	42.877		2010-06-22
SIGN	1864863	LS	W-054-R Hazard marker - right East Telspar 1 No	43.061	43.061		2010-06-22
SIGN	1864174	LS	W-061-R Right Lane Ends symbol East Wood 1 No	43.213	43.213		2010-06-22
SIGN	1864175	RS	W-061-R Right Lane Ends symbol East Bridge 0 No	43.214	43.214		2010-06-22
SIGN	1864547	RS	W-003-LU REVERSE CURVE LEFT ARROW West Wood 1 No	43.214	43.214		2010-06-22
SIGN	1864448	RS	PS-009 Do Not Pass School Bus symbol When Lights Flashing West Wood 1 No	43.291	43.291		2010-06-22
SIGN	1863779	LS	W-011 Stop Sign symbol AHEAD ARROW East Wood 1 No	43.324	43.324		2010-06-22
SIGN	1864447	LS	PS-009 Do Not Pass School Bus symbol When Lights Flashing East Wood 1 No	43.386	43.386		2010-06-22
SIGN	1864661	RS	W-064-1 Deer symbol West Wood 1 No	43.389	43.389		2010-06-22

Inventory Item Location Report

Sorted by Highway Number

Service Area: Fraser Valley SA

AMA: 07-C - Area C

Sub Area: 07-C-3 - Boston Bar

RFI Highway: 07-C-3-00001 TRANS CANADA E/B

RFI Length: 66.621

RFI Direction: E

<u>Inventory Item</u>	<u>Primary Key</u>	<u>KSP</u>	<u>Attributes</u>	<u>Chainage</u>		<u>Length</u>	<u>Modification</u>
				<u>Start</u>	<u>End</u>		
SIGN	1864349	RS	W-024-U For () km tab West No Post 0 No	43.389	43.389		2010-06-22
SIGN	1864362	LS	W-042 Falling Rocks symbol East Wood 1 No	43.412	43.412		2010-06-22
SIGN	1864202	LS	SA Service & Attraction East Wood 2 No SA-15-1-31	43.440	43.440		2010-06-22
SIGN	1864492	RS	G-104 () km Reference marker West Telspar 1 No	43.617	43.617		2010-06-22
SIGN	1864785	RS	W-054-D Hazard marker - double West Wood 1 No	43.772	43.772		2010-06-22
SIGN	1864546	LS	W-003-LU REVERSE CURVE LEFT ARROW East Wood 1 No	43.806	43.806		2010-06-22
SIGN	1864446	LS	PS-009 Do Not Pass School Bus symbol When Lights Flashing East Wood 1 No	43.897	43.897		2010-06-22
SIGN	1864648	LS	R-007-1 Slower Traffic Keep Right East Wood 1 No	44.452	44.452		2010-06-22
SIGN	1864862	RS	W-054-R Hazard marker - right West Telspar 1 No	44.479	44.479		2010-06-22
SIGN	1864861	LS	W-054-R Hazard marker - right East Telspar 1 No	44.564	44.564		2010-06-22
SIGN	1864647	RS	R-007-1 Slower Traffic Keep Right West Wood 1 No	45.055	45.055		2010-06-22
SIGN	1864860	LS	W-054-R Hazard marker - right East Telspar 1 No	45.139	45.139		2010-06-22
SIGN	1863932	LS	P-066-T Next () km tab East No Post 0 No 3 KM	45.232	45.232		2010-06-22
SIGN	1864379	LS	P-066-1 No Stopping symbol Avalanche Area East Wood 2	45.232	45.232		2010-06-22

Inventory Item Location Report

Sorted by Highway Number

Service Area: Fraser Valley SA

AMA: 07-C - Area C

Sub Area: 07-C-3 - Boston Bar

RFI Highway: 07-C-3-00001 TRANS CANADA E/B

RFI Length: 66.621

RFI Direction: E

Inventory Item	Primary Key	XSP	Attributes	Chainage		Length	Modification
				Start	End		
			No				
SIGN	1863919	RS	W-106 End Avalanche Area West Wood 1 No	45.249	45.249		2010-06-22
SIGN	1864173	LS	W-061-R Right Lane Ends symbol East Wood 1 No	45.384	45.384		2010-06-22
SIGN	1864172	RS	W-061-R Right Lane Ends symbol East Wood 1 No	45.385	45.385		2010-06-22
SIGN	1864171	LS	W-061-R Right Lane Ends symbol East Wood 1 No	45.526	45.526		2010-06-22
SIGN	1864479	RS	W-035 DO NOT USE-Trucks Turning West Wood 1 No	45.593	45.593		2010-06-22
SIGN	1864491	RS	G-104 () km Reference marker West Telspar 1 No	45.622	45.622		2010-06-22
SIGN	1864406	LS	R-053-1 Vehicle Combinations () or More Axles (Trailers) Must Chain Up Here HINGED South No Post 0 No	45.867	45.867		2010-06-22
SIGN	1864393	LS	R-059 Danger No Trespassing Excavation South Wood 1 No	45.875	45.875		2010-06-22
SIGN	1864405	LS	R-053-1 Vehicle Combinations () or More Axles (Trailers) Must Chain Up Here HINGED South No Post 0 No	45.921	45.921		2010-06-22
SIGN	1864201	RS	SA Service & Attraction West Wood 2 No SA-15-1	46.159	46.159		2010-06-22
SIGN	1864478	LS	W-035 DO NOT USE-Trucks Turning East Wood 1 No	46.192	46.192		2010-06-22
SIGN	1864200	RS	SA Service & Attraction West Wood 2 No SA-15-1	46.337	46.337		2010-06-22
SIGN	1864141	LS	P-058 No Stopping symbol DIRECTIONAL ARROW(S) South Wood 1 No RIGHT ARROW	46.543	46.543		2010-06-22

Inventory Item Location Report

Sorted by Highway Number

Service Area: Fraser Valley SA

AMA: 07-C - Area C

Sub Area: 07-C-3 - Boston Bar

RFI Highway: 07-C-3-00001 TRANS CANADA E/B

RFI Length: 66.621

RFI Direction: E

<u>Inventory</u> <u>Item</u>	<u>Primary Key</u>	<u>XSP</u>	<u>Attributes</u>	<u>Chainage</u>		<u>Length</u>	<u>Modification</u>
				<u>Start</u>	<u>End</u>		
SIGN	1864443	LS	R-043 Do Not Dump Refuse South No Post 0 No	46.549	46.549		2010-06-22
SIGN	1864234	LS	P-058 No Stopping symbol DIRECTIONAL ARROW(S) South Wood 1 No DOUBLE ARROW	46.632	46.632		2010-06-22
SIGN	1864147	LS	P-058 No Stopping symbol DIRECTIONAL ARROW(S) South Wood 1 No LEFT ARROW	46.723	46.723		2010-06-22
SIGN	1864199	LS	SA Service & Attraction East Wood 2 No SA-15-?	47.080	47.080		2010-06-22
SIGN	1864198	RS	SA Service & Attraction West Wood 2 No SA-15-1-25 	47.169	47.169		2010-06-22
SIGN	1864197	LS	SA Service & Attraction East Wood 2 No SA-15-1-24? 	47.257	47.257		2010-06-22
SIGN	1864081	LS	R-001-U STOP sign East Wood 1 No	47.354	47.354		2010-06-22
SIGN	1864080	LS	R-001-U STOP sign North Wood 1 No	47.468	47.468		2010-06-22
SIGN	1864490	RS	G-104 () km Reference marker West Telspar 1 No 	47.628	47.628		2010-06-22
SIGN	1864196	LS	SA Service & Attraction East Plastic 1 No SA-15-1- 26 C3S-400	47.655	47.655		2010-06-22
SIGN	1864170	RS	W-061-R Right Lane Ends symbol West Wood 1 No	47.668	47.668		2010-06-22
SIGN	1864168	LS	W-061-R Right Lane Ends symbol West Wood 1 No	47.806	47.806		2010-06-22
SIGN	1864169	RS	W-061-R Right Lane Ends symbol West Wood 1 No	47.807	47.807		2010-06-22
SIGN	1864646	LS	R-007-1 Slower Traffic Keep Right East Wood 1 No	47.960	47.960		2010-06-22

Inventory Item Location Report

Sorted by Highway Number

Service Area: Fraser Valley SA

AMA: 07-C - Area C

Sub Area: 07-C-3 - Boston Bar

RFI Highway: 07-C-3-00001 TRANS CANADA E/B

RFI Length: 66.621

RFI Direction: E

Inventory Item	Primary Key	XSP	Attributes	Chainage		Length	Modification
				Start	End		
SIGN	1864361	RS	W-042 Falling Rocks symbol West Wood 1 No	48.009	48.009		2010-06-22
SIGN	1864859	LS	W-054-R Hazard marker - right East Wood 1 No	48.368	48.368		2010-06-22
SIGN	1864795	RS	W-316-1L Logging Truck symbol - left South Plastic 1 No C3-405	48.502	48.502		2010-06-22
SIGN	1864360	RS	W-042 Falling Rocks symbol West Wood 1 No	48.660	48.660		2010-06-22
SIGN	1864359	LS	W-042 Falling Rocks symbol West Wood 1 No	48.736	48.736		2010-06-22
SIGN	1864858	LS	W-054-R Hazard marker - right East Wood 1 No	48.742	48.742		2010-06-22
SIGN	1864167	LS	W-061-R Right Lane Ends symbol East Wood 1 No	48.806	48.806		2010-06-22
SIGN	1864732	RS	I-082-1 Passing Lane () km Ahead West Wood 1 No	48.807	48.807		2010-06-22
SIGN	1864166	RS	W-061-R Right Lane Ends symbol East No Post 0 No	48.807	48.807		2010-06-22
SIGN	1864165	LS	W-061-R Right Lane Ends symbol East Wood 1 No	48.945	48.945		2010-06-22
SIGN	1864794	LS	W-316-1R Logging Truck Crossing - Right North Plastic 1 No C3-405	49.352	49.352		2010-06-22
SIGN	1864358	LS	W-042 Falling Rocks symbol East Wood 1 No	49.600	49.600		2010-06-22
SIGN	1864489	RS	G-104 () km Reference marker West Telspar 1 No	49.622	49.622		2010-06-22

Inventory Item Location Report

Sorted by Highway Number

Service Area: Fraser Valley SA

AMA: 07-C - Area C

Sub Area: 07-C-3 - Boston Bar

RFI Highway: 07-C-3-00001 TRANS CANADA E/B

RFI Length: 66.621

RFI Direction: E

Inventory Item	Primary Key	XSP	Attributes	Chainage		Length	Modification
				Start	End		
SIGN	1864645	LS	R-007-1 Slower Traffic Keep Right East Wood 1 No	49.999	49.999		2010-06-22
SIGN	1864857	RS	W-054-R Hazard marker - right West Telspar 1 No	50.148	50.148		2010-06-22
SIGN	1864140	LS	P-058 No Stopping symbol DIRECTIONAL ARROW(S) East No Post 0 No RIGHT ARROW	50.162	50.162		2010-06-22
SIGN	1864856	RS	W-054-R Hazard marker - right West Telspar 1 No	50.162	50.162		2010-06-22
SIGN	1863814	LS	W-054-L Hazard marker - left East Telspar 1 No	50.162	50.162		2010-06-22
SIGN	1864146	RS	P-058 No Stopping symbol DIRECTIONAL ARROW(S) North No Post 0 No LEFT ARROW	50.162	50.162		2010-06-22
SIGN	1864190	RS	I-003 Landmark (Name) marker West No Post 0 No AINSLIE CREEK	50.162	50.162		2010-06-22
SIGN	1864145	LS	P-058 No Stopping symbol DIRECTIONAL ARROW(S) South No Post 0 No LEFT ARROW	50.401	50.401		2010-06-22
SIGN	1863813	RS	W-054-L Hazard marker - left East No Post 0 No	50.401	50.401		2010-06-22
SIGN	1864855	LS	W-054-R Hazard marker - right East Telspar 1 No	50.401	50.401		2010-06-22
SIGN	1864189	LS	I-003 Landmark (Name) marker East No Post 0 No AINSLIE CREEK	50.401	50.401		2010-06-22
SIGN	1864854	LS	W-054-R Hazard marker - right East Telspar 1 No	50.422	50.422		2010-06-22
SIGN	1864644	LS	R-007-1 Slower Traffic Keep Right West Wood 1 No	50.838	50.838		2010-06-22

Inventory Item Location Report

Sorted by Highway Number

2013-08-29 02:49 PM

Service Area: Fraser Valley SA

AMA: 07-C - Area C

Sub Area: 07-C-3 - Boston Bar

RFI Highway: 07-C-3-00001 TRANS CANADA E/B

RFI Length: 66.621

RFI Direction: E

Inventory Item	Primary Key	XSP	Attributes	Chainage		Length	Modification
				Start	End		
SIGN	1864853	LS	W-054-R Hazard marker - right East Wood 1 No	50.973	50.973		2010-06-22
SIGN	1863946	RS	W-064-1 Deer symbol South Metal 1 No C3-421	51.062	51.062		2010-06-22
SIGN	1863795	LS	R-004 Maximum POSTED SPEED () km/h East Wood 1 No MAX 90KM/H	51.210	51.210		2010-06-22
SIGN	1864488	RS	G-104 () km Reference marker West Telspar 1 No 90 KM	51.628	51.628		2010-06-22
SIGN	1864348	LS	W-024-U For () km tab East No Post 0 No 8KM	51.720	51.720		2010-06-22
SIGN	1864660	LS	W-064-1 Deer symbol East Wood 1 No	51.720	51.720		2010-06-22
SIGN	1864545	LS	W-003-LU REVERSE CURVE LEFT ARROW East Wood 1 No 	51.811	51.811		2010-06-22
SIGN	1864731	LS	I-082-1 Passing Lane () km Ahead East Wood 1 No 	51.890	51.890		2010-06-22
SIGN	1864477	RS	W-035 DO NOT USE-Trucks Turning West Wood 1 No	51.988	51.988		2010-06-22
SIGN	1864476	LS	W-035 DO NOT USE-Trucks Turning East Wood 1 No	52.331	52.331		2010-06-22
SIGN	1864542	LS	R-022-1 Do Not Pass symbol East Wood 1 No	52.416	52.416		2010-06-22
SIGN	1864643	RS	R-007-1 Slower Traffic Keep Right West Wood 1 No 	52.762	52.762		2010-06-22
SIGN	1864852	LS	W-054-R Hazard marker - right East Telspar 1 No	52.810	52.810		2010-06-22
SIGN	1863805	RS	SA Service & Attraction South Metal 1 No SA-15-1- 140 C3S-500 KAHMOOSE GAS	52.892	52.892		2010-06-22

Inventory Item Location Report

Sorted by Highway Number

Service Area: Fraser Valley SA

AMA: 07-C - Area C

Sub Area: 07-C-3 - Boston Bar

RFI Highway: 07-C-3-00001 TRANS CANADA E/B

RFI Length: 66.621

RFI Direction: E

<u>Inventory</u> <u>Item</u>	<u>Primary Key</u>	<u>XSP</u>	<u>Attributes</u>	<u>Chainage</u>		<u>Length</u>	<u>Modification</u>
				<u>Start</u>	<u>End</u>		
SIGN	1864195	RS	SA Service & Attraction West Wood 2 No SA-15-1-?? FRASER ACRES	52.939	52.939		2010-06-22
SIGN	1864762	RS	W-006-U Crossroad symbol West Wood 1 No	53.027	53.027		2010-06-22
SIGN	1864535	LS	W-038-1 Merge South Metal 1 No C3-513	53.072	53.072		2010-06-22
SIGN	1864761	LS	W-006-U Crossroad symbol East Wood 1 No	53.342	53.342		2010-06-22
SIGN	1864531	RS	W-041-1 Slippery Surface symbol West Wood 1 No	53.342	53.342		2010-06-22
SIGN	1863803	LS	SA Service & Attraction East Wood 2 No SA-15-1-? FRASER ACRES	53.409	53.409		2010-06-22
SIGN	1864530	LS	W-041-1 Slippery Surface symbol East Wood 1 No	53.461	53.461		2010-06-22
SIGN	1863794	RS	R-004 Maximum POSTED SPEED () km/h West Wood 1 No MAX 90KM/H	53.463	53.463		2010-06-22
SIGN	1863804	LS	SA Service & Attraction North Metal 1 No SA-15-1- 141 C3S-500 KAHMOOSE GAS	53.539	53.539		2010-06-22
SIGN	1863942	RS	W-064-1 Deer symbol South Metal 1 No C3-500	53.541	53.541		2010-06-22
SIGN	1864575	LS	W-061-R Right Lane Ends symbol North Metal 1 No C3-513	53.601	53.601		2010-06-22
SIGN	1864164	RS	W-061-R Right Lane Ends symbol North Metal 1 No C3-513	53.601	53.601		2010-06-22
SIGN	1864487	RS	G-104 () km Reference marker West Telspar 1 No 	53.632	53.632		2010-06-22

Inventory Item Location Report

Sorted by Highway Number

Service Area: Fraser Valley SA

AMA: 07-C - Area C

Sub Area: 07-C-3 - Boston Bar

RFI Highway: 07-C-3-00001 TRANS CANADA E/B

RFI Length: 66.621

RFI Direction: E

Inventory Item	Primary Key	XSP	Attributes	Chainage		Length	Modification
				Start	End		
SIGN	1864792	LS	W-030-TE () m distance tab North No Post 0 No C3-513	53.892	53.892		2010-06-22
SIGN	1864576	LS	W-061-R Right Lane Ends symbol North Metal 1 No C3-513	53.892	53.892		2010-06-22
SIGN	1863781	LS	W-037-RU Merging Traffic Right symbol North Metal 1 No C3-513	54.092	54.092		2010-06-22
SIGN	1863793	LS	R-004 Maximum POSTED SPEED () km/h East Wood 1 No MAX 90KM/H	54.593	54.593		2010-06-22
SIGN	1864642	LS	R-007-1 Slower Traffic Keep Right East Wood 1 No 	54.841	54.841		2010-06-22
SIGN	1864486	RS	G-104 () km Reference marker West Metal 1 No	55.634	55.634		2010-06-22
SIGN	1864163	LS	W-061-R Right Lane Ends symbol East Wood 1 No	55.705	55.705		2010-06-22
SIGN	1864162	LS	W-061-R Right Lane Ends symbol East Wood 1 No	55.709	55.709		2010-06-22
SIGN	1864161	LS	W-061-R Right Lane Ends symbol East Wood 1 No	55.841	55.841		2010-06-22
SIGN	1863792	LS	R-004 Maximum POSTED SPEED () km/h East Wood 1 No MAX 90KM/H	55.989	55.989		2010-06-22
SIGN	1864851	LS	W-054-R Hazard marker - right East Telspar 1 No	56.230	56.230		2010-06-22
SIGN	1864160	RS	W-061-R Right Lane Ends symbol West Wood 1 No	56.305	56.305		2010-06-22
SIGN	1863808	RS	SA Service & Attraction West Wood 2 No SA-15-1-138 	56.381	56.381		2010-06-22

Collision Summary Report

Collision Selection Criteria

=====

SUBSET NAME: Hwy 1 Seg 0905 LKI km 71.2
SUBSET DATE: 2013-09-19 12:36:15
TOTAL KMS: 10.1
TOTAL COLLISIONS: 37

QUERY PROFILE - GEOGRAPHIC

Query Name: Hwy 1 Seg 0905 LKI km 71.2
Description:
Query Type: PRI (Primary Query)
Collision Period From: 2001-11-12
Collision Period To: 2011-11-12
LKI Update Flag? N
Effective Date: 2013-09-19
Hwy Classification: 2002 - 2002 Classification Scheme (Classification Scheme defined in 2002)
Expiry Date: 2013-10-19

----- Segment Selection -----

Segment Selection Mode: FTL (From-To List)
Numbered? N
Lettered? N
Unnumbered? N
Devolved? N
Query Segment Node Selection: ONE (One Occurances of a Node)

HWY	SEG	KM - HWY	SEG	KM - INCL	OPP
1	0905	66.2 - 1	0905	76.2 -	N

----- Section Definition File -----

Report Date: 2013-09-19
User: s.15
Environment: PRD

Page 1 of 11
Report Number: CIS-003

Collision Summary Report

Collision Selection Criteria

----- MoT Admin Area -----

----- Landmark Type -----

----- Highway Class -----

QUERY PROFILE - COLLISION

----- Collision Info -----

Fatal? Y

Injured? : Y

Property Damage Only? Y

Query Obsolete Locations: OL (Obsolete Locations)

----- Dates -----

From Month:

To Month:

From Day:

To Day:

From Time: :

To Time: :

Report Date: 2013-09-19

User: s.15

Environment: PRD

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Report Number: CIS-003

TRA-2015-00027
Page 376

Collision Summary Report

Collision Selection Criteria

----- Data Fields -----

Logic Between Field Groups: And

----- CM Collision Type -----

SEARCH PATH

SEARCH PATH START KM END KM # CLLSNS
Seg 0905 66.2 76.2 37

Report Date: 2013-09-19

User: s.15

Environment: PRD

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Report Number: CIS-003

Collision Summary Report

Highway Segment	Km	Collision Case #	Collision Date	Time	Collision Type	Total Killed	Total Injury	Tot Veh	Primary Occurrence	Location Type	First Contributing Factor for First Vehicle	Road Surface Condition	Weather Conditions	Direction Travel V1	Travel V2	
1	0905	66.2	R3023250	2003-08-26	14:45	INJ	0	2	2	Head on	Btwn intersection/exchs	Extreme fatigue	Dry	Clear	North	South
1	0905	66.2	R3702335	2007-10-28	13:05	PDO	0	0	2	Left turn head on	Int road&driveway/alley	Driver inattentive	Dry	Cloudy	North	South
1	0905	66.2	R4122082	2009-10-09	11:00	INJ	0	1	2	Rear end	Btwn intersection/exchs	Not applicable	Dry	Clear	North	North
1	0905	66.3	R3823580	2008-05-02	17:50	INJ	0	2	2	Left turn 90'	Int road&driveway/alley	Alcohol suspected	Dry	Cloudy	West	East
1	0905	66.3	R3702340	2010-05-10	08:51	PDO	0	0	1	Backing	Int road&driveway/alley	Other	Dry	Clear	West	
1	0905	66.4	R3798623	2007-11-11	05:45	INJ	0	1	1	Off road left	Btwn intersection/exchs	Tires-failure/inadequate	Dry	Cloudy	South	
1	0905	66.6	R3342084	2005-09-06	18:55	INJ	0	1	2	Head on	Btwn intersection/exchs	Not applicable	Dry	Clear	North	South
1	0905	66.7	R3702053	2007-07-09	22:59	INJ	0	1	1	Off road right	Btwn intersection/exchs	Alcohol suspected	Dry	Clear	North	
1	0905	68.3	R3702061	2008-08-30	16:00	INJ	0	1	1	Off road left	Btwn intersection/exchs	Alcohol suspected	Wet	Raining	South	
1	0905	68.4	R3147522	2001-11-28	14:00	PDO	0	0	2	Rear end	Btwn intersection/exchs	Unknown	Slush	Snowing/sleet	South	South
1	0905	68.4	R3147540	2002-11-19	16:20	PDO	0	0	2	Overtaking	Btwn intersection/exchs	Driving without due care	Wet	Cloudy	West	West
1	0905	68.4	R4137484	2009-08-09	19:27	INJ	0	2	1	Off road left	Btwn intersection/exchs	Not applicable	Dry	Clear	South	
1	0905	68.4	R4137539	2009-09-04	02:00	PDO	0	0	1	Off road right	Btwn intersection/exchs	Ability impaired by alcohol	Dry	Clear	North	
1	0905	68.5	R2859673	2004-02-21	07:55	FAT	1	0	1	Off road right	Btwn intersection/exchs	Driving on wrong side of road	Wet	Fog	South	
1	0905	69.0	R3702266	2006-08-23	21:17	PDO	0	0	1	Other	Btwn intersection/exchs	Not applicable	Dry	Cloudy	West	
1	0905	69.5	R3148014	2003-08-01	14:59	INJ	0	1	1	Off road right	Off highway	Tires-failure/inadequate	Dry	Clear	South	
1	0905	69.5	R3148061	2003-11-10	06:30	PDO	0	0	1	Off road left	Btwn intersection/exchs	Weather (fog,sleet,rain,snow)	Ice	Raining	East	
1	0905	69.7	R3702353	2004-11-21	08:41	INJ	0	2	1	Off road left	Btwn intersection/exchs	Fell asleep	Dry	Cloudy	West	
1	0905	70.0	R3148062	2003-11-10	05:15	PDO	0	0	1	Off road left	Btwn intersection/exchs	Weather (fog,sleet,rain,snow)	Ice	Raining	East	
1	0905	70.0	R3702275	2006-12-25	13:05	PDO	0	0	2	Rear end	Btwn intersection/exchs	Not applicable	Snow	Snowing/sleet	North	North
1	0905	70.4	R3519410	2005-01-17	16:05	INJ	0	1	1	Off road left	Btwn intersection/exchs	Driver inattentive	Slush	Snowing/sleet	South	
1	0905	70.5	R4137531	2009-03-12	23:30	INJ	0	1	1	Other	Btwn intersection/exchs	Fell asleep	Dry	Clear	North	

Report Date: 2013-09-19

User: s.15

Environment: PRD

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Report Number: CIS-003

Collision Summary Report

Highway Segment	Km	Collision Case #	Collision Date	Time	Collision Type	Total Killed	Total Injury	Tot Veh	Primary Occurrence	Location Type	First Contributing Factor for First Vehicle	Road Surface Condition	Weather Conditions	Direction Travel V1	Direction Travel V2		
1	0905	70.8	R3702258	2005-07-30	01:05	PDO	0	0	1	Other	intersection/exchs	Wild animal	Dry	Clear	North		
1	0905	71.2	R3147513	2001-12-17	07:30	PDO	0	0	1	Other	At intersection	Other	Wet	Clear	North		
1	0905	71.2	R3148060	2003-11-10	05:30	PDO	0	0	1	Off road right	Btwn intersection/exchs	Weather (fog,sleet,rain,snow)	Ice	Raining	West		
1	0905	71.2	R4122091	2010-12-23	12:30	PDO	0	0	1	Intersection 90'	Btwn intersection/exchs	Road condition (ice,snow,slush)	Snow	Snowing/sleet	North		
1	0905	71.2	R3980493	2011-11-12	17:13	INJ	0	3	5	Rear end	At intersection	Unknown	Wet	Raining	East	East	
1	0905	72.0	R3537683	2007-11-26	19:10	INJ	0	2	2	Off road right	Btwn intersection/exchs	Avoiding veh./ped./cycle	Snow	Snowing/sleet	West	West	
1	0905	72.5	R3148053	2003-09-29	11:22	INJ	0	3	3	Head on	Btwn intersection/exchs	Illness**	Dry	Clear	East	West	
1	0905	72.5	R3983755	2007-12-18	13:02	FAT	1	0	3	Side swipe	Btwn intersection/exchs	Insecure load	Snow	Snowing/sleet	South	North	
1	0905	74.5	R3148013	2003-04-24	14:15	PDO	0	0	2	Side swipe	Btwn intersection/exchs	Driving without due care	Wet	Raining	South	North	
1	0905	75.0	R3147514	2001-11-28	12:20	PDO	0	0	2	Side swipe	Bridge	Other	Snow	Snowing/sleet	North	South	
1	0905	75.0	R3702184	2005-11-06	10:30	PDO	0	0	1	Off road right	Transit express lane	Driver inattentive	Slush	Cloudy	West		
1	0905	75.0	R3597011	2006-01-31	16:30	PDO	0	0	1	Head on	Btwn intersection/exchs	Obstruction/debris on road	Wet	Raining	South		
1	0905	75.0	R3612453	2006-12-01	09:30	INJ	0	2	1	Off road left	Btwn intersection/exchs	Driving too fast for condition	Slush	Snowing/sleet	South		
1	0905	76.0	R3519418	2006-08-23	12:46	PDO	0	0	1	Off road left	Btwn intersection/exchs	Driver inattentive	Dry	Clear	South		
1	0905	76.1	R3702261	2005-12-19	11:25	PDO	0	0	1	Off road right	Btwn intersection/exchs	Driver inattentive	Snow	Snowing/sleet	South		
Report Totals	Total Collisions: 37			Total Killed: 2		Total Injured: 26		Total Vehicles: 56		Collision Counts		Total Fatal: 2		Total Injury: 16		Total PDO: 19	

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Collision Summary Report

Statistics By Month

Year	Month	Collisions	Total FAT	Collision Severity		Total PDO	Total Killed	Total Injured	Total Vehicles
				Total INJ					
2001	January	0	0	0		0	0	0	0
2001	February	0	0	0		0	0	0	0
2001	March	0	0	0		0	0	0	0
2001	April	0	0	0		0	0	0	0
2001	May	0	0	0		0	0	0	0
2001	June	0	0	0		0	0	0	0
2001	July	0	0	0		0	0	0	0
2001	August	0	0	0		0	0	0	0
2001	September	0	0	0		0	0	0	0
2001	October	0	0	0		0	0	0	0
2001	November	2	0	0		2	0	0	4
2001	December	1	0	0		1	0	0	1
2002	January	0	0	0		0	0	0	0
2002	February	0	0	0		0	0	0	0
2002	March	0	0	0		0	0	0	0
2002	April	0	0	0		0	0	0	0
2002	May	0	0	0		0	0	0	0
2002	June	0	0	0		0	0	0	0
2002	July	0	0	0		0	0	0	0
2002	August	0	0	0		0	0	0	0
2002	September	0	0	0		0	0	0	0
2002	October	0	0	0		0	0	0	0
2002	November	1	0	0		1	0	0	2
2002	December	0	0	0		0	0	0	0
2003	January	0	0	0		0	0	0	0
2003	February	0	0	0		0	0	0	0
2003	March	0	0	0		0	0	0	0
2003	April	1	0	0		1	0	0	2

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Collision Summary Report

Year	Month	Collisions	Collision Severity		Total PDO	Total Killed	Total Injured	Total Vehicles
			Total FAT	Total INJ				
2003	May	0	0	0	0	0	0	0
2003	June	0	0	0	0	0	0	0
2003	July	0	0	0	0	0	0	0
2003	August	2	0	2	0	0	3	3
2003	September	1	0	1	0	0	3	3
2003	October	0	0	0	0	0	0	0
2003	November	3	0	0	3	0	0	3
2003	December	0	0	0	0	0	0	0
2004	January	0	0	0	0	0	0	0
2004	February	1	1	0	0	1	0	1
2004	March	0	0	0	0	0	0	0
2004	April	0	0	0	0	0	0	0
2004	May	0	0	0	0	0	0	0
2004	June	0	0	0	0	0	0	0
2004	July	0	0	0	0	0	0	0
2004	August	0	0	0	0	0	0	0
2004	September	0	0	0	0	0	0	0
2004	October	0	0	0	0	0	0	0
2004	November	1	0	1	0	0	2	1
2004	December	0	0	0	0	0	0	0
2005	January	1	0	1	0	0	1	1
2005	February	0	0	0	0	0	0	0
2005	March	0	0	0	0	0	0	0
2005	April	0	0	0	0	0	0	0
2005	May	0	0	0	0	0	0	0
2005	June	0	0	0	0	0	0	0
2005	July	1	0	0	1	0	0	1
2005	August	0	0	0	0	0	0	0
2005	September	1	0	1	0	0	1	2
2005	October	0	0	0	0	0	0	0

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Collision Summary Report

Year	Month	Collisions	Total FAT	Collision Severity		Total PDO	Total Killed	Total Injured	Total Vehicles
				Total INJ					
2005	November	1	0	0		1	0	0	1
2005	December	1	0	0		1	0	0	1
2006	January	1	0	0		1	0	0	1
2006	February	0	0	0		0	0	0	0
2006	March	0	0	0		0	0	0	0
2006	April	0	0	0		0	0	0	0
2006	May	0	0	0		0	0	0	0
2006	June	0	0	0		0	0	0	0
2006	July	0	0	0		0	0	0	0
2006	August	2	0	0		2	0	0	2
2006	September	0	0	0		0	0	0	0
2006	October	0	0	0		0	0	0	0
2006	November	0	0	0		0	0	0	0
2006	December	2	0	1		1	0	2	3
2007	January	0	0	0		0	0	0	0
2007	February	0	0	0		0	0	0	0
2007	March	0	0	0		0	0	0	0
2007	April	0	0	0		0	0	0	0
2007	May	0	0	0		0	0	0	0
2007	June	0	0	0		0	0	0	0
2007	July	1	0	1		0	0	1	1
2007	August	0	0	0		0	0	0	0
2007	September	0	0	0		0	0	0	0
2007	October	1	0	0		1	0	0	2
2007	November	2	0	2		0	0	3	3
2007	December	1	1	0		0	1	0	3
2008	January	0	0	0		0	0	0	0
2008	February	0	0	0		0	0	0	0
2008	March	0	0	0		0	0	0	0
2008	April	0	0	0		0	0	0	0

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Collision Summary Report

Year	Month	Collisions	Total FAT	Collision Severity		Total PDO	Total Killed	Total Injured	Total Vehicles
				Total INJ	Total PDO				
2008	May	1	0	1	0	0	0	2	2
2008	June	0	0	0	0	0	0	0	0
2008	July	0	0	0	0	0	0	0	0
2008	August	1	0	1	0	0	1	1	1
2008	September	0	0	0	0	0	0	0	0
2008	October	0	0	0	0	0	0	0	0
2008	November	0	0	0	0	0	0	0	0
2008	December	0	0	0	0	0	0	0	0
2009	January	0	0	0	0	0	0	0	0
2009	February	0	0	0	0	0	0	0	0
2009	March	1	0	1	0	0	1	1	1
2009	April	0	0	0	0	0	0	0	0
2009	May	0	0	0	0	0	0	0	0
2009	June	0	0	0	0	0	0	0	0
2009	July	0	0	0	0	0	0	0	0
2009	August	1	0	1	0	0	2	1	1
2009	September	1	0	0	1	0	0	1	1
2009	October	1	0	1	0	0	1	2	2
2009	November	0	0	0	0	0	0	0	0
2009	December	0	0	0	0	0	0	0	0
2010	January	0	0	0	0	0	0	0	0
2010	February	0	0	0	0	0	0	0	0
2010	March	0	0	0	0	0	0	0	0
2010	April	0	0	0	0	0	0	0	0
2010	May	1	0	0	1	0	0	1	1
2010	June	0	0	0	0	0	0	0	0
2010	July	0	0	0	0	0	0	0	0
2010	August	0	0	0	0	0	0	0	0
2010	September	0	0	0	0	0	0	0	0
2010	October	0	0	0	0	0	0	0	0

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Collision Summary Report

Year	Month	Collisions	Total FAT	Collision Severity		Total PDO	Total Killed	Total Injured	Total Vehicles
				Total INJ					
2010	November	0	0	0		0	0	0	0
2010	December	1	0	0		1	0	0	1
2011	January	0	0	0		0	0	0	0
2011	February	0	0	0		0	0	0	0
2011	March	0	0	0		0	0	0	0
2011	April	0	0	0		0	0	0	0
2011	May	0	0	0		0	0	0	0
2011	June	0	0	0		0	0	0	0
2011	July	0	0	0		0	0	0	0
2011	August	0	0	0		0	0	0	0
2011	September	0	0	0		0	0	0	0
2011	October	0	0	0		0	0	0	0
2011	November	1	0	1		0	0	3	5
2011	December	0	0	0		0	0	0	0
Totals:		37	2	16		19	2	26	56

Report Date: 2013-09-19

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Environment: PRD

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Collision Summary Report

Statistics By Year

Year	Collisions	Collision Severity			Total PDO	Total Killed	Total Injured	Total Vehicles
		Total FAT	Total INJ	Total PDO				
2001	3	0	0	3	0	0	5	
2002	1	0	0	1	0	0	2	
2003	7	0	3	4	0	6	11	
2004	2	1	1	0	1	2	2	
2005	5	0	2	3	0	2	6	
2006	5	0	1	4	0	2	6	
2007	5	1	3	1	1	4	9	
2008	2	0	2	0	0	3	3	
2009	4	0	3	1	0	4	5	
2010	2	0	0	2	0	0	2	
2011	1	0	1	0	0	3	5	
Totals:	37	2	16	19	2	26	56	

Report Date: 2013-09-19

User: s.15

Environment: PRD

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Collision Histogram Report

Collision Period From: 2001-11-12 To: 2011-11-12

Collision Selection Criteria

```
=====
SUBSET NAME: Hwy 1 Seg 0905 LKI km 71.2
SUBSET DATE: 2013-09-19 12:36:15
TOTAL KMS: 10.1
TOTAL COLLISIONS: 37
-----
QUERY PROFILE - GEOGRAPHIC
-----
Query Name: Hwy 1 Seg 0905 LKI km 71.2
Description:
Query Type: PRI (Primary Query)
Collision Period From: 2001-11-12
Collision Period To: 2011-11-12
LKI Update Flag? N
Effective Date: 2013-09-19
Hwy Classification: 2002 - 2002 Classification Scheme (Classification Scheme defined in 2002)
Expiry Date: 2013-10-19
```

---- Segment Selection ----

```
Segment Selection Mode: FTL (From-To List)
Numbered? N
Lettered? N
Unnumbered? N
Devolved? N
Query Segment Node Selection: ONE (One Occurances of a Node)
```

HWY	SEG	KM -	HWY	SEG	KM -	INCL	OPP
1	0905	66.2 -	1	0905	76.2 -	N	

----- Section Definition File -----

----- MoT Admin Area -----

----- Landmark Type -----

----- Highway Class -----

Report Date: 2013-09-19
User: s.15
Environment: PRD

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Collision Histogram Report

Collision Period From: 2001-11-12

To: 2011-11-12

Collision Selection Criteria

QUERY PROFILE - COLLISION

----- Collision Info -----

Fatal? Y

Injured? : Y

Property Damage Only? Y

Query Obsolete Locations: OL (Obsolete Locations)

----- Dates -----

From Month:

To Month:

From Day:

To Day:

From Time: :

To Time: :

--- Data Fields -----

Logic Between Field Groups: And

----- CM Collision Type -----

SEARCH PATH

SEARCH PATH START KM END KM # CLLSNS
Seg 0905 66.2 76.2 37

Collision Histogram Report

Collision Period From: 2001-11-12 To: 2011-11-12

Scale: ■ = 1 collision(s) ■ FAT: # Fatal ■ INJ: # Non-fatal Injury ■ PDO: # Property Damage Only

Histogram for: HWY 1 TRANS-CANADA
SEGMENT 0905 JCT OLD ROUTE 3 TO ROUTE 12 AT LYTTON FROM KM 66.2 TO KM 69.5

Landmark Description	Km	Histogram of Collision Frequency	FAT	INJ	PDO	Total
Segment 0905						
NORTHBEND FERRY RD	66.2		0	2	1	3
COTTONWOOD RD	66.3		0	1	1	2
PULLOUT	66.4		0	1	0	1
	66.5		0	0	0	0
	66.6		0	1	0	1
PULLOUT	66.7		0	1	0	1
	66.8		0	0	0	0
	66.9		0	0	0	0
	67.0		0	0	0	0
	67.1		0	0	0	0
	67.2		0	0	0	0
	67.3		0	0	0	0
	67.4		0	0	0	0
LLOUT	67.5		0	0	0	0
	67.6		0	0	0	0
	67.7		0	0	0	0
	67.8		0	0	0	0
	67.9		0	0	0	0
PULLOUT	68.0		0	0	0	0
	68.1		0	0	0	0
	68.2		0	0	0	0
	68.3		0	1	0	1
	68.4		0	1	3	4
	68.5		1	0	0	1
	68.6		0	0	0	0
	68.7		0	0	0	0
	68.8		0	0	0	0
	68.9		0	0	0	0
	69.0		0	0	1	1
	69.1		0	0	0	0
	69.2		0	0	0	0
	69.3		0	0	0	0
	69.4		0	0	0	0
	69.5		0	1	1	2

Collision Histogram Report

Collision Period From: 2001-11-12 To: 2011-11-12

Scale: ■ = 1 collision(s) ■ FAT: # Fatal ■ INJ: # Non-fatal Injury ■ PDO: # Property Damage Only

Histogram for: HWY 1 TRANS-CANADA
SEGMENT 0905 JCT OLD ROUTE 3 TO ROUTE 12 AT LYTTON FROM KM 69.6 TO KM 72.9

Landmark Description	Km	Histogram of Collision Frequency	FAT	INJ	PDO	Total
	69.6		0	0	0	0
	69.7		0	1	0	1
BEGIN PASSING LANE N/B	69.8		0	0	0	0
	69.9		0	0	0	0
PULLOUT	70.0		0	0	2	2
	70.1		0	0	0	0
	70.2		0	0	0	0
	70.3		0	0	0	0
	70.4		0	1	0	1
ACCESS TO FLORENCE PIT	70.5		0	1	0	1
	70.6		0	0	0	0
	70.7		0	0	0	0
	70.8		0	0	1	1
	70.9		0	0	0	0
	71.0		0	0	0	0
	71.1		0	0	0	0
SLANZI RD	71.2		0	1	3	4
	71.3		0	0	0	0
	71.4		0	0	0	0
ACCESS TO ALPINE MOTEL	71.5		0	0	0	0
	71.6		0	0	0	0
	71.7		0	0	0	0
	71.8		0	0	0	0
	71.9		0	0	0	0
AINSLIE RD (S)	72.0		0	1	0	1
ACCESS TO GREEN CANYON MOTEL	72.1		0	0	0	0
	72.2		0	0	0	0
	72.3		0	0	0	0
	72.4		0	0	0	0
	72.5		1	1	0	2
BEGIN PULLOUT	72.6		0	0	0	0
	72.7		0	0	0	0
END PULLOUT	72.8		0	0	0	0
	72.9		0	0	0	0

Collision Histogram Report

Collision Period From: 2001-11-12 To: 2011-11-12

Scale: ■ = 1 collision(s) ■ FAT: # Fatal ■ INJ: # Non-fatal Injury ■ PDO: # Property Damage Only

Histogram for: HWY 1 TRANS-CANADA
SEGMENT 0905 JCT OLD ROUTE 3 TO ROUTE 12 AT LYTTON FROM KM 73.0 TO KM 76.2

Landmark Description	Km	Histogram of Collision Frequency	FAT	INJ	PDO	Total
	73.0		0	0	0	0
	73.1		0	0	0	0
	73.2		0	0	0	0
	73.3		0	0	0	0
	73.4		0	0	0	0
LOGGING ACCESS RD	73.5		0	0	0	0
	73.6		0	0	0	0
	73.7		0	0	0	0
	73.8		0	0	0	0
	73.9		0	0	0	0
	74.0		0	0	0	0
	74.1		0	0	0	0
BEGIN PULLOUT	74.2		0	0	0	0
	74.3		0	0	0	0
	74.4		0	0	0	0
END PULLOUT	74.5	■	0	0	1	1
	74.6		0	0	0	0
	74.7		0	0	0	0
AINSLIE CREEK BRIDGE S END 0388	74.8		0	0	0	0
	74.9		0	0	0	0
AINSLIE CREEK BRIDGE N END 0388	75.0	■ ■	0	1	3	4
	75.1		0	0	0	0
	75.2		0	0	0	0
	75.3		0	0	0	0
	75.4		0	0	0	0
	75.5		0	0	0	0
	75.6		0	0	0	0
	75.7		0	0	0	0
	75.8		0	0	0	0
	75.9		0	0	0	0
	76.0	■	0	0	1	1
	76.1	■	0	0	1	1
	76.2		0	0	0	0

Collision Histogram Report

Collision Period From: 2001-11-12 To: 2011-11-12

Scale: ■ = 1 collision(s) ■ FAT: # Fatal ■ INJ: # Non-fatal Injury ■ PDO: # Property Damage Only

Histogram for: HWY 1 TRANS-CANADA

SEGMENT 0905

JCT OLD ROUTE 3 TO ROUTE 12 AT LYTTON

FROM KM

TO KM

Landmark Description	Km	Histogram of Collision Frequency	FAT	INJ	PDO	Total
Segment 0905 Totals			2	16	19	37
DISCONTINUITY IN SEARCH PATH						
Report Totals			2	16	19	37