

Fraser Valley Variable Speed Limit System

Project Charter

Project#: 12743-0001

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Creation Date: November 25, 2016
Last Updated: June 15, 2017
Document Number: 12743 - 0001
Version: V 0.2

Approvals:

Project Sponsor

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Purpose of Document

This document defines the project in terms of objectives, scope, stakeholders and major deliverables. Approval of this document allows detailed Project Planning to begin.

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1.0 Project Sponsor

The sponsor of the project is Ed Miska, Executive Director Engineering Services

2.0 Project Purpose

The purpose of the project is to implement a road/weather based variable speed limit system on Highway 1 between Sumas River Bridge in Abbotsford and Prest Road in Chilliwack on Hwy 3 from Hope to the junction of Highway 3 and Highway 5. The Abbotsford/Chilliwack segment will include a congestion based variable speed limit system.

Background

Following the implementation of increased speed limits on provincial highways as recommended in the July 2014 Rural Highway Safety and Speed Review, further review indicated 14 areas within the 33 sections of highways where the crash rate increased during the year after increased speed limits were introduced. While seven of these 14 sections saw an increase in speed and an increase in crashes, the other seven saw speeds drop after the speed limit increased, but an increase in crashes. The review further noted the top cause for crashes in 11 of these highways was driver inattentiveness.

Recommendations from Ministry traffic engineers included the implementation of a weather/road and congestion-based variable speed limit system on Highway 1 from Whatcom Road to Hope, where driver inattentiveness and driving too fast were the root causes of increased crashes. The congestion-based system is recommended for the 24 KM between Sumas River Bridge and Prest Road.

Recommendations also included the implementation of a weather/road based variable speed limit system on Highway 3 for the 7 km between the junction of Highway 1 and 3 and Highway 3 and 5.

3.0 Objectives

The objectives of the project are to:

- Increase driver awareness of speed limits that are posted based on weather conditions
- Increase driver awareness of speed limits that are posted based on road conditions
- Decrease speed-related crashes on Highway 1 on sections of the highway within scope
- Decrease driver inattentiveness-related crashes on Highway 1 on sections of the highway within scope

- Decrease weather-related crashes on Highway 3 on sections of the highway within scope

4.0 Scope

The scope of the project is to design, construct and integrate a congestion/weather based variable speed limit system on Highway 1 between Sumas River Bridge in Abbotsford and Prest Road in Chilliwack (approximately 24 km) and a road/weather based variable speed limit system between Annis Road and the junctions of Highway 1 and Highway 3 and on Hwy 3 between the junctions of Highway 1 and Highway 5 (approximately 7 km) including system design, system installation, development of necessary software, integration of software into the existing variable speed limit system within the Regional Transportation Management Centre (RTMC) decision protocols, operation and maintenance procedures, stakeholder consultation and a public education campaign.

The scope also includes updating existing subsystems based on lessons learned from the implementation of the variable speed limit system on sections of Highways 1, 5 and 99 earlier this year. Updates will include improving Digital Message Sign (DMS) functionality, system algorithms for road and weather data, segment assignment, sign update intervals and improving processes for operators within the RTMC.

A variable speed limit system uses pavement and traffic sensors to measure weather, pavement condition, and traffic flow. This information is then processed centrally and used to determine an adjusted speed limit for the current conditions that is posted on variable speed signs along the corridor. Motorists are informed of an upcoming active variable speed limit system and inclement weather ahead by overhead DMS signs installed at the start of each variable speed limit corridor.

Each system will include several data collection stations positioned strategically throughout the corridor that will record vehicle speed information, roadway friction, visibility, condition of the road surface and a webcam image. Data will be transmitted to a centrally housed software program in the Coquitlam RTMC that will analyze the data and recommend a modified speed limit. A designated Ministry of Transportation and Infrastructure representative will then have the final decision-making ability to modify the speed limit which will be posted on several variable speed limit signs installed throughout the corridor.

4.1 In Scope

The scope of the project includes:

- Installation of communication fibre along Highway 1 from Hwy 11 in Abbotsford to Prest Road in Chilliwack to support the congestion based variable speed limit system
- Jurisdictional review of congestion-based variable speed limit systems throughout Canada, the United States and Europe

- Electrical and civil design of both the congestion based and road weather based variable speed limit system
- Develop tender documents for both the installation of civil works and the manufacturing of ITS cabinets
- Procurement of electrical components, including ITS cabinets supplied under the major works contract
- Design and manufacturing ITS cabinets
- Manage the installation of bases, poles, signs, electrical components and ITS cabinets on Highway 1 and 3
- Software design of a new congestion-based subsystem, including algorithm development
- Software design to integrate the new variable speed limit system into the existing system
- Software design to share “real time” information from the variable speed limit system to RCMP vehicle computer units
- Technical memorandum reviewing system architecture in order to inform the integration of the new variable speed limit system within the existing Advanced Traffic Management System (ATMS)
- Update to system architecture based on recommendations from technical memorandum
- Technical memorandum that recommends efficiencies in new processes to accommodate field requests to make changes in speed limits, expanding existing and developing new reports and tracking system failures
- Implement new processes, reporting and tracking features based on recommendations from technical memorandum
- Update to DriveBC variable speed limit system layer to include new corridor
- Testing and commissioning of electronic components
- Testing and commissioning of software
- Update training manuals for RTMC Operators
- Train RTMC Operators
- Develop and implement public information strategy

4.2 Out of Scope

The following items are out of scope and provided here to help clarify the scope boundaries of the project:

- Development of operational costs for the new variable speed limit system
- Ongoing maintenance and operation of the new variable speed limit system

5.0 Major Deliverables

The major deliverable products for this project are:

- Jurisdictional review of congestion-based variable speed limit systems throughout Canada, the United States and Europe,
- Technical memorandum reviewing system architecture in order to inform the integration of the new variable speed limit system within the existing Advanced Traffic Management System (ATMS),
- Technical memorandum that recommends efficiencies in new processes to accommodate field requests to make changes in speed limits, expanding existing and developing new reports and tracking system failures,
- A congestion-based variable speed limit system on Highway 1 from approximately Sumas River Bridge in Abbotsford to Prest Road, Chilliwack including the installation of electronic speed signs, digital message signs, pavement sensors, PTZ cameras, radar, ITS cabinets and roadside data processors. This congestion-based road system also includes the weather subsystem,
- A road/weather variable speed limit system on Highway 3 from Hope to the junction of Highway 3 and Highway 5 including the installation of electronic speed signs, digital message signs, pavement sensors, web cameras, radar, ITS cabinets and roadside data processors,
- Operational and maintenance manuals for the variable speed limit system for maintenance contracts and for RTMC operational purposes,
- Updated RTMC Operator training modules,

6.0 Stakeholders

The Minister of Transportation and Infrastructure, Minister Todd Stone – the Minister announced that the project would be operational “12-18 months” from July 2016 and is interested in the success of the system and reducing crashes on the highway

Ed Miska, Director of Engineering, Ministry of Transportation and Infrastructure - Project Sponsor who is interested in the success of the system, reducing crashes on the highway, project timelines and project cost

Joyce Chang, Director of the RTMC – any new system added to the ATMS at the RTMC potentially impacts operational budget for ongoing system maintenance and staffing

Ashok Bhatti, Regional Director, South Coast Region – interested in the impact on the RTMC operational costs and staffing and the success of the project

Janelle Erwin, Deputy Director, South Coast Region - interested in the project budget, schedule and success of the project

RTMC Managers, Supervisors and Operators – any new system added to the ATMS at the RTMC potentially impacts the functionality of existing systems and staff workload

Local MLA and politicians – interested in the implementation of the project and project timelines

South Coast Region ITS and Electrical group - any new system added to the ATMS at the RTMC potentially impacts workload due to equipment errors, software errors and maintenance issues

MOTI Traffic Engineering, Director Kenedee Ludwar – any new traffic system impacts workload

MOTI Information Management Branch (IMB) staff, Director Jesse Piccin - responsible for implementing updates to the DriveBC variable speed limit layer

MOTI District Operation and Area Managers – interested in the success of the project, impacts to maintenance activities and the development of processes to request speed limit changes

Contracted Maintenance Contractors – interested in the impact of the system on contracted maintenance activities and development of processes to request speed limit changes

RCMP Traffic Division, Doug Smith, Liaison – interested in enforcement of traffic speeds along Highway 1 and Highway 3 and in the reduction of crashes along the highways

BC Trucking Association – interested in the functionality of the system and maintaining traffic flow on the highways

Travelling public – interested in the success of the system and reducing crashes on the highways

6.1 Stakeholder Categories

For the purposes of defining the most appropriate methods for engaging the stakeholder groups, the stakeholders have been assigned categories according to their level of influence and their expected interest in or impact from the project and its outcomes. The table below illustrates the categories to be used for the stakeholders.

<i>Stakeholder Category</i>	<i>Description</i>	<i>Stakeholder Groups</i>
Partner	<ul style="list-style-type: none"> • High level of influence on the project and highly impacted by the project; therefore should be highly interested. • Commitment is required by these stakeholders in order for the project to succeed. • Stakeholder would be represented on the steering committee. • Would also participate in working groups. 	<ul style="list-style-type: none"> • Minister Todd Stone • MOTI Executive <ul style="list-style-type: none"> ◦ Ed Miska, Project Sponsor ◦ Kevin Richter, ADM of Highways ◦ Norm Parkes, Executive Director of Highways
Involve	<ul style="list-style-type: none"> • Low level of influence on the project and high level of impact by the project; should be very interested. • Involvement is required to ensure the stakeholder group's requirements are represented on the project. 	<ul style="list-style-type: none"> • RCMP Traffic Division • MOTI IMB Director and staff • MOTI ITS Manager and staff • MOTI Electrical Director and staff • MOTI Traffic Director and staff
Explain	<ul style="list-style-type: none"> • High level of influence, low level of impact; interest is usually focused on one or two aspects only. • Stakeholder must be kept clearly informed on the project outcomes and progress so that they continue to support the project. 	<ul style="list-style-type: none"> • RTMC Director and staff • MOTI District Staff • MOTI Maintenance Contractors • SCR Regional Director • SCR Deputy Regional Director • MLA and local politicians
Inform	<ul style="list-style-type: none"> • Low level of influence, low level of impact; general interest only. • Stakeholder needs to be kept informed of the project. 	<ul style="list-style-type: none"> • Travelling public

6.2 Stakeholders and their Interests

The table below identifies the major stakeholders for the project, who will represent them, what their interests, expectations and concerns in the strategy are understood to be (these will be confirmed via the engagement strategy), as well as the stakeholder category they have been assigned. The following stakeholders' (internal and external) interests must be considered throughout the project:

<i>Stakeholder Group</i>	<i>Represented by</i>	<i>Interests, Expectations, Concerns</i>
Ministry of Transportation and Infrastructure (MOTI) Minister and Executive	Ed Miska, Executive Director of Engineering	<ul style="list-style-type: none"> • Project deliverables are met within timelines • Project is completed within budget • Stakeholders are engaged and consulted with
MOTI South Coast Region Management	Jennifer Locke, Project Manager	<ul style="list-style-type: none"> • Project deliverables are met within timelines • Project is completed within budget • Stakeholders are engaged and consulted with • Regular project updates
MOTI Traffic	Kenedee Ludwar, Graeme Cross, Karamjeet Deogan	<ul style="list-style-type: none"> • Speed algorithms developed ensure reasonable speeds for the travelling public
MOTI ITS	Lina Halwani, Matthew Brown, Will Zhang	<ul style="list-style-type: none"> • Project is well integrated into the existing ATMS • Current functioning of the ATMC is not impacted by the project • Alerts for the system are well documented and easy to manage
MOTI Electrical	Lina Halwani, Brigid Canil, Abid Sivic	<ul style="list-style-type: none"> • Electrical components are similar to those used for other projects • Maintenance manuals are updated for maintenance contractors • Warranties for components are negotiated and documented
MOTI RTMC	Joyce Chang , Porya Khorsandi	<ul style="list-style-type: none"> • The RTMC is provided with adequate staffing required for new systems coming online • RTMC Operators are trained in the new system • Electronic processes are put in place to manage requests for speed limit changes
MOTI District Staff	Thomas Chhun, Mike Kelly, Peter Cocker	<ul style="list-style-type: none"> • VSLS signs placement reflect existing areas of concern • Requirements of Maintenance Contractors are clearly stated • Updated maintenance manuals are provided for Maintenance Contractors • Stakeholders are engaged and communicated with
RCMP Traffic Division	Doug Ferguson, Police Liaison	<ul style="list-style-type: none"> • RCMP are consulted with in relation to sign placement and speed enforcement • RCMP receive real time information of speed changes through police vehicle units • RCMP receive regular project updates

<i>Stakeholder Group</i>	<i>Represented by</i>	<i>Interests, Expectations, Concerns</i>
MOTI Maintenance Contractors	Emil Anderson Cobra Electric	<ul style="list-style-type: none"> • Requirements of Maintenance Contractors are clearly stated • Updated maintenance manuals are provided for Maintenance Contractors • Placement of VSLS equipment coincides with highway maintenance activities
MLA's	Fraser- Nicola – Jackie Tagert (LIB) Chilliwack-Hope – Laurie Throness (LIB) Abbotsford-Mission – Simon Gibson (LIB) Abbotsford-South – Darryl Plecas (LIB)	<ul style="list-style-type: none"> • Project briefing • Project announcements • Project updates
City/District Mayors	Abbotsford – Mayor Henry Braun Chilliwack – Mayor Sharon Gaetz Hope – Mayor Wilfried Vicktor	<ul style="list-style-type: none"> • Project briefing • Project announcements • Project updates

7.0 Links and Dependencies

This project is dependent on the following:

- The installation of new communication fibre for approximately 30km between Hwy 11 in Abbotsford and Prest Road in Chilliwack. The fibre is required to ensure adequate communication between the RTMC and the variable speed limit system.

Projects and initiatives that depend on this project include:

- Recommendations following the review of the implementation of recommendations in the 2014 Rural Highway Safety and Speed Review

Success of this project is linked to the following:

- Availability of project team members to complete assigned tasks as scheduled
- The reduction of vehicle crashes along the sections of Highway 1 and Highway 3 where the variable speed limit system is implemented

8.0 Issues and Constraints

Issues and constraints that could impact project success include:

- Adequate funding – the current budget is based on a high level estimate and may not consider all components of the project.
- Installation of communications fibre – dependent on outside communication companies being willing to cost share this portion of the project.
- Project timelines – timelines for the project are very constrained and can only be achieved if all team members are able to complete their tasks on schedule.
- Electronic speed sign identification – the project may use a different speed sign that was used in the first phase. The electronic sign chosen must be identified by mid-January in order to ensure the specifications for the ITS cabinets are confirmed.
- Early procurement of the components and manufacturing of ITS cabinets required for the project. Procurement must start in January 2017 in order to meet schedule.
- Successful software development for the congestion-based segment of the system is critical to meet timelines that include extensive testing of the software.

9.0 Assumptions

The following assumptions have been made for the project:

- Legislation and regulations are in place to support the Fraser Valley variable speed limit project
- The road/weather system implemented with this system will be the same as the one used in the variable speed limit system pilot project
- Similar procurement methods used for the variable speed limit pilot project will be approved by Ministry executive, i.e. the use of As and When contracts for electrical and software design, the Ministry purchase of electronic components, a separate RFQ for ITS cabinet manufacturing
- Key project team members are available to work on the project and meet assigned timelines
- The Ministry will find a partner to help install the 30 km of communication fibre along Highway 1

10.0 Approach

The project will utilize existing As and When contracts in order to move forward quickly with electrical and software design. The Ministry will procure electrical components for the system, including contracting the manufacturing of ITS cabinets including the required components of the cabinet. Any additional DMS signs that are required will also be purchased through the Ministry. A major works contract will be tendered for the civil and electrical work required to construct the system roadside. The installation of communication fibre will be completed by identified partners. The system will be tested in a staging environment prior to going to production and prior to being implemented with live traffic.

11.0 Milestones

The major milestones / targets / review points for the project are:

<i>Milestone</i>	<i>Target Date</i>
Commence ITS Cabinet manufacturing	March 2017
Tender Major Works contract	May 2017
Start of Construction	July 2017
Construction completed	September 2017

12.0 Budget

The estimated budget for this project follows:

<i>Fiscal Year</i>	<i>Project Costs</i>	<i>Costs (Labour – FTEs Operational)</i>	<i>Operational Costs (non Labour)</i>
yyyy/yyyy	\$0	\$0	\$0
(etc)	\$0	\$0	\$0
Total	\$0	\$0	\$0

[If you cannot estimate the operational costs, then choose a percentage (suggest 15%) of development costs annually and document the assumption here.]

The following hardware/software will need to be acquired. These costs are [or are not] included in the Total Project Costs above.

<i>Material Resource</i>	<i>Why Needed</i>	<i>Effort /</i>	<i>Estimated</i>
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<i>Type</i>		<i>Timeframe</i>	<i>Cost</i>
			\$0

13.0 Overall Resources Required

13.1 Internal Resources

Estimated internal resource requirements include: [Sample resource roles follow.]

<i>Resource Role</i>	<i>Time Estimate Range</i>
Project Manager	20 hours/week
ITS Leads	5 hours/week
Traffic Leads	5 hours/week
Electrical Leads	5 hours/week
RTMC supervisor	3 hours/week

13.2 External Resources

External resource requirements include: [Sample resource types follow.]

<i>Resource Type</i>	<i>Why Needed</i>	<i>Estimated Cost</i>
Information Management Branch	Assist with Data Warehouse reports, assist with DriveBC layer, assist with RCMP portal	\$15,000
RCMP	Assist in development of RCMP portal	\$0
External Consultants	To design, test and commission electrical components and software design	\$800,000
Vendors and Suppliers -	To supply electronic components	\$2,000,000
Total		\$2,815,000

13.3 Special Committees

No special committees are required for this project.

14.0 Risk Assessment

[Identify strategies and plans for dealing with any identified risk. Use the matrix below to assist with the development and incorporate into the overall risk plan.]

Risk #	Risk Event or Assumption	Likelihood to Occur (L,M,H)	Impact if Occurs (L,M,H)	Mitigation Plan
1.	Installation of new communication fibre for approximately 30km between Whatcom Road in Abbotsford and Annis Road in Chilliwack does not get outside funding	M	H	If MOTI is not able to find a partner to install the fibre, MOTI will either need to pay for the full installation and tender this work separately, or not install at all. If installation does not occur, then redundancy is not built into this section of the project.
2.	Delay in project schedule – timelines for the project are very constrained and can only be achieved if all team members are able to complete their tasks on schedule.	M	H	Identify issues in task completion early in order to request more resources to supplement.
3.	Delay in electronic speed sign identification	M	H	Identify issues in task completion early in order to request more resources to supplement.
4.	Procurement of the components and manufacturing of ITS cabinets required for the project is delayed Procurement must start in January 2017 in order to meet schedule.	M	H	Risk is medium only if there is delay in electronic speed sign identification – if there is delay, MOTI will likely need to pay for more resources in manufacturing in order to keep schedule.
5.	Difficulty with new software for the congestion-based segment of the system.	L	M	Ensure testing is thorough and completed on time.

Reviews and Document Control

Reviews

UPDATED: 2007-04-10

PRINTED: 2019-05-23

12743. FV.VSLs.Project Charter V2_

This document has been sent to the following for their review and comment.

Name	Position

Project Management

Name	Position
[name]	Project Manager

Document Control

[Drafts start at 0.1 whereas a document ready for signature becomes version 1.0.]

Date	Author	Version	Change Reference
[date]		0.1	Original document

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