



Connected Vehicle - A Transportation Planning Perspective

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What Connected Vehicle Means to Transport Agencies

- Informal Discussion – Transport Canada, BCMoT, TransLink
 - Awareness Building - CV Hits Mainstream, Penetration Rate
 - Infrastructure Planning – Proactive Supports, vice versa
 - Policy Setting – Policy, Regulations, Programs & Funding
- Possible CV Impacts
 - Safety, Transportation Operations, Commercial Vehicle Regulation, Asset Management, e-Payment, etc.



BC ITS Strategic Plan/ Architecture

New 2012 Planning Exercise (previous version 2001)

- Transport Canada, BC and TransLink
- Canada ITS Architecture 2.0
- Regional ITS Architecture Guidance for Canada
- Planning Platform to support CV

Relevant ITS Service Packages

- Service Area: Vehicle Safety with 12 Packages
- Roles of Road Authorities & Future Connected Vehicle Requirements & Benefits – to be Explored



Connected Vehicle – Relevant ITS Service Packages

- Vehicle Safety Service – Automated Hwy System etc.
- Hazardous Incident/ Vehicle Tracking
- Commercial Vehicle Border Processes/ Port e-Clearance, Regulation, Roadside Safety Inspection
- Dynamic Roadway Warning/ Route Guidance
- VII Traveller Information/ In-Vehicle Signing
- Traffic Probe/ Surveillance
- Advanced Mixed Use Warning system/ Work Zone
- Incident/ Emergency/ Disaster Management, Others



Connected Vehicle – ITS Architectures

- **US National ITS Architecture V7 – What's New?**
 - In Step with Industry – Connected Vehicle, Commercial Vehicle Information & System Network (CVISN)s
 - Synchronize with Canadian Architecture with added services
 - Planning View of the Architecture – Planning, Project Development
 - Reflects Current ITS Advancements and Standards – Active Traffic Management, Road User Pricing



From Needs to Reality on Highway System

Auto21, Connected Vehicle

↓ **ITS Architectures**

↓ Regional ITS Planning

↓ Transportation Planning

↓ Transportation Programming/ Funding

↓ Regional ITS Deployment

Support/ Mainstream Connected Vehicles



OUTLINE

- ITS History in BC
- Where we are now
- Where we're going
- Summary



ITS in BC

Pre-connection

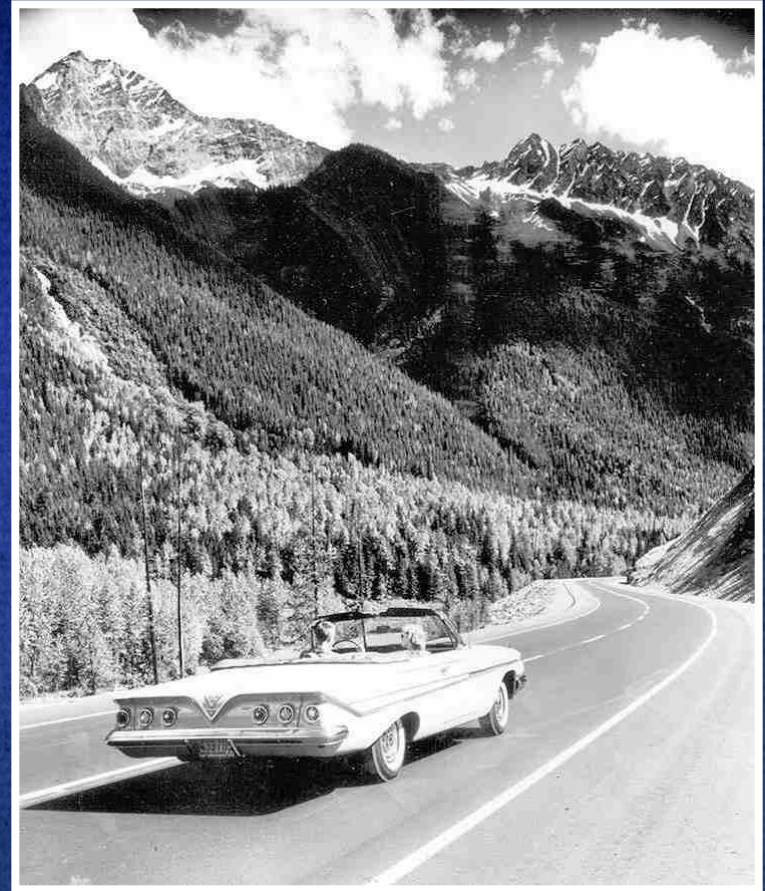
**Improved Information, Communications
with Drivers**

Future



The Pre-connected Way

- Freedom - no cell phone, email, text message, GPS
- Limited information, guidance, warning, assistance when needed





Changeable Message Signs

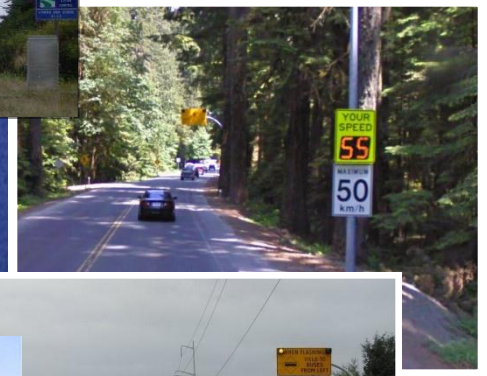
- ▶ 37 changeable message signs
- ▶ Message Hierarchy (high to low):
 - Amber alerts, public emergencies
 - Incidents and road conditions
 - Planned events and traffic management
 - Public service messages
 - Good road conditions
- ▶ Road Weather Info System (63 Stns)
- ▶ Provincial Highway Condition Centre (PHCC Control Centre)





Communications with Drivers

- ▶ Changeable Message Signs
- ▶ Lane Control Signals
- ▶ Vehicle Activated Signs/ Systems
- ▶ Active Warning Signs
- ▶ Advanced Traveller Info System
- ▶ Weigh2GoBC – Networked AVI with Signal to Truck Operators
- ▶ Highway Advisory Radio - Audio





Internet & 3/4G

- ▶ DriveBC Website with ATIS – webcams
- ▶ Border ATIS on Web
- ▶ Automated Voice Recognition (AVR) 511
- ▶ Mobile Apps
- ▶ Text Messages
- ▶ Facebook, Flickr, Pinterest, etc.



Others

- Advanced Traveller Information System (ATIS)
 - DriveBC/ Highway Webcams (over 200 and growing)
 - Border ATIS, Automated Truck Staging
- Commercial Truck Regulation
 - Weigh2Go BC – 24 inspection stations (9 networked, 3 WIM)
 - Automated Routing System (future)
- Road Weather Information Stations (63 Stns)





Challenges & ITS Opportunities

Challenges

- Urban Congestion
- Safety and Security
- Aging Drivers
- Climate Changes
- Economic Facilitation
- Very Limited Resources
- Public Expectation

ITS Opportunities

- Technology
- Information
- Regional Cooperation



BC ITS - Cooperation/ Integration/ Connection

Key Foundational Initiatives

- Regional Transportation Management Centre (RTMC)
- Regional Traffic Data System (RTDS)
- BC ITS Strategic Plan 2012
- RFID Interoperability Guide
- Regional Communications Study
- Future – Connected Vehicle
- Shared ITS Infrastructure
- ~ Regional ITS Database
- ~ Shared ITS Road Map/Vision
- ~ V2I Interoperability
- ~ I2I Connectivity
- ~ I2V Connectivity



Regional Transportation Management Centre (RTMC)

- 2010 Winter Olympics Experience
- Command Centre
- Transportation/ Traffic Management
- Event/ Incident/ Emergency/ Disaster/ Management
- Data and Communications Hub, Info Sharing
- Other Transportation Services (CVO, toll, ops...)





Regional Traffic Data System (RTDS)

- Collect real time travel data using probes
- Provide traffic flow and travel time information
- Support active management of congestion and incidents via RTMC
- Archive data to support planning/programming/ evaluation for regional agencies





Regional ITS Road Map

2012 BC ITS Strategic Plan

Shared Vision

**Improving Livability and Economic
Prosperity through Intelligent
Transportation and Innovation**



BC ITS Goals (draft)

- Improve efficiency, reliability and accessibility of existing and future transportation network
- Improve safety and security
- Contribute to economic prosperity in a sustainable manner - environment, communities, and stakeholders
- Improve quality, accessibility and usability of information & intelligence
- Improve customer service

Coordinated ITS Programs/ Projects, Regionally/
Bi-nationally



Transportation Planning Framework

- BC Transportation Plan
- Provincial Highway Plan

Transportation
Investment Plan

Funding Programs

-
- BC ITS Plan 2001
 - Unfunded (opportunistic)
 - Not integrated
 - Lack champion and institutional cooperation framework



Possible Transportation Planning Framework

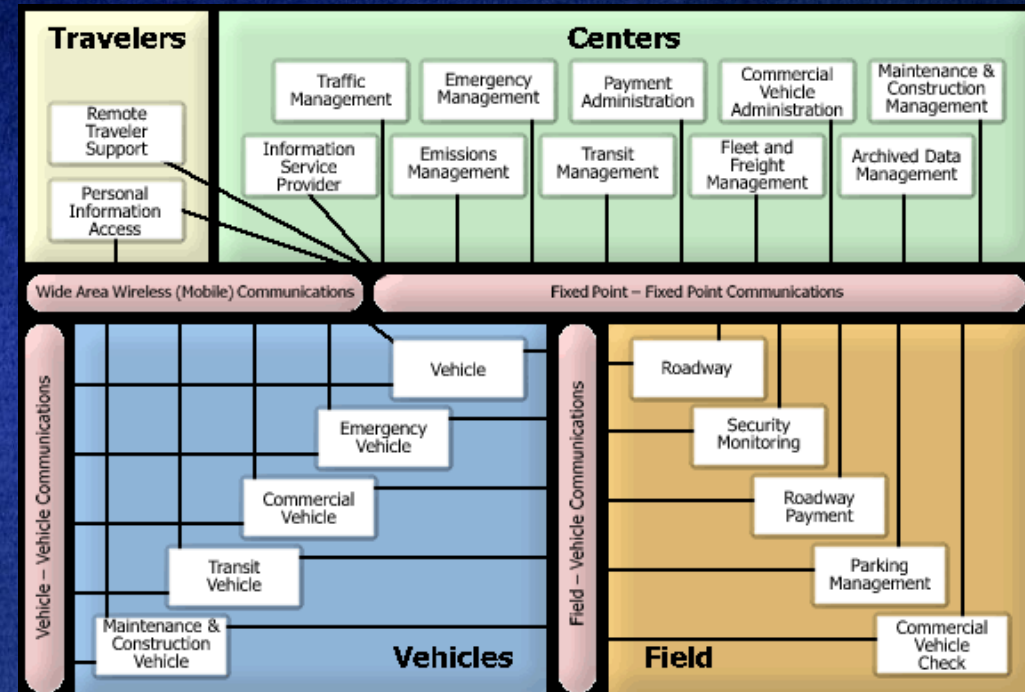
- BC Gov2.0, Transformation Plan
 - BC Transportation Plan
 - Provincial Highway Plan
 - BC ITS Strategic Plan 2012
 - Coordinated Funding Partnership
 - Coordinated Development with Other Plans/ Programs
 - Champion and Institutional Cooperation
 - ITS Plan as a Living Document
- ↓ **Transportation Investment Priorities**
- ↓ **Funding Programs**
- ↓ **Time**
- ↓ **Infrastructure Support for Connected Vehicle**



ITS Architecture & Connected Vehicle

- ITS Subsystems/ Communications

- Centres
- Field
- Travellers
- Vehicles
 - Loops, radar - Sensing
 - Commercial vehicles-AVI
 - Toll transponders, GPS, 3/4G, blue tooth
 - Transit/ Maintenance
 - Connected Vehicle - Future I2V?



- Fixed Pt – Fixed Pt
- Wide Area Mobile
- Vehicle – Vehicle
- Field - Vehicle



Provincial Direction

- BC Government 2.0 – Citizens @ the Centre
 - Citizen Participation
 - Self-Service
 - Business Innovation
- Transformation Plan – Building Blocks for Tomorrow's Transportation Network:
 - Become World Leaders in Goods Movement & Tracking
 - Integrate Smart Highways Technologies into the Network
 - Engage Citizen – 2-way real time dialogue, open data sharing



Sample Transformation Strategies/ Projects

- DriveBC enhancements, social media tools, new mobile apps, and webcam expansion
- Expand Weigh2GoBC program, mobile apps for trucks
- ITS foundation projects – RTMC, RTDS, Strategic Plan
- Engage public/ private sectors partners and academia to prepare for highway system requirements that will support the advancement of intelligent vehicle systems
- Use technology to measure supply chain inefficiencies and promote competitive advantages



Intelligent Vehicle Technologies

- Initial Activities:
 - Facilitate and Attend Conferences/Workshops to support Intelligent Vehicle Systems
 - Engage Public and Private Sectors Partners and Academia
 - Incorporate into Regional ITS Plan - to deploy initiatives in the next 3 years



Ministry of **Transportation
and Infrastructure**



Connected Vehicle - ITS - Infrastructure



QUESTIONS?

