Wyoming Interstate 80 Variable Speed Limits (VSL)

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Overview

- Project Location
- Key Stakeholders
- Implementation
- VSL Operating Policy
- Results
- Future Deployments
I-80 Background Information

Source: FHWA Freight Management and Operations Division
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- Major east-west commerce route

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Project Location
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Project Location

- Peterson Int. (MP 238.15) to Quealy Dome (MP 290.44)

52.29 miles
Key Project Stakeholders

- District Maintenance
- District Traffic
- Wyoming Highway Patrol
- Transportation Management Center
- University of Wyoming
- WYDOT – ITS Program
VSL Approach

- VSL’s located at interchanges to inform people as soon as they enter the system

- VSL Located on both median and shoulder side for visibility
VSL Approach

- **Focus:** tighten speed distribution
VSL Approach

- Focus: tighten speed distribution
VSL Approach

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Representative Scenario

Speed Distribution Graph

- Green line: Without VSL
- Purple line: With VSL

Number of Vehicles

Speed
Representative Scenario

Speed Distribution Graph

- Green line: Without VSL
- Purple line: With VSL

Graph showing the number of vehicles at different speeds with and without Variable Speed Limits (VSL).
What Does a WYDOT VSL Sign Look Like?
What Does a WYDOT VSL Sign Look Like?
Roadside Hardware (Skyline)

Keypad Interface

Environmental Display Board

Sign Face Driver

Motor Control Board

Sign Comm Board

RS485 Conv.

RS232 Conv.

T/R

T/R

To median VSL Sign

TMC
Roadside Hardware (Skyline)
Roadside Hardware (Addco)

Handheld Keypad
NTCIP Controller
Addco SC5 Controller
LED Display

TMC
TMC Software
VSL Policy

- Legislation went into effect 7/1/2008
  - Grants authority to set the speed limit based on "vehicle or weather emergency"
  
  "...differing limits may be established for different times of day, different types of vehicles, varying weather conditions, and other factors bearing on safe speeds, which shall be effective when posted upon appropriate fixed or variable signs."
VSL Operational Policy

- Interim Protocol/Policy
  - WHP or Maintenance Foreman may lower speed based on visual inspection
  - TMC can lower speed if speed varies more than 10 mph and no one is available for visual inspection
  - Only WHP or Maintenance can raise speed limit

- Interim Protocol Used until Decision Support System completed
Research Results

- Following slide demonstrates actual storm event - December 1 - 2, 2009
- Four stages of a storm
Figure 7: Ideal histogram MP 256.25 December 1-2, 2009

Figure 8: Transition histogram MP 256.25 December 1-2, 2009

Figure 9: VSL implemented histogram MP 256.25 December 1-2, 2009

Figure 10: Extended VSL histogram MP 256.25 December 1-2, 2009
Dry and Clear

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65 MPH posted

Dry and Clear

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Dry and Clear

65 MPH posted
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Storm Begins to Impact Roadway
Dry and Clear

65 MPH posted

Storm Begins

to Impact

Roadway
Dry and Clear

65 MPH posted

Strom Begins to Impact Roadway
Dry and Clear

65 MPH posted

Storm Begins to Impact Roadway

55 MPH posted
Dry and Clear

65 MPH posted

Storm Begins to Impact Roadway

VSL In Effect

55 MPH posted
Dry and Clear

65 MPH posted

Storm Begins to Impact Roadway

55 MPH posted

VSL In Effect

Extended VSL Histogram
Dry and Clear

65 MPH posted

Storm Begins to Impact Roadway

55 MPH posted

VSL In Effect

Storm Clears (VSL In Effect)
Dry and Clear

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Storm Begins to Impact Roadway

55 MPH posted

VSL In Effect

Storm Clears (VSL In Effect)
Crash Data

Elk Mountain Corridor (MP 238-291) Crash Data
April 15, 2001 - April 15, 2010

First Full Year of VSL
2010 Data plotted on the Graph

FY Sand Usage VS June 1 Sand Lake Precip

Year

2002 2003 2004 2005 2006 2007 2008 2009 2010

% Snow Pack

0.0% 20.0% 40.0% 60.0% 80.0% 100.0% 120.0% 140.0%

Tons of Sand

0 2000 4000 6000 8000 10000 12000 14000 16000
Future Deployments
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- Favorable response – 4 more projects
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