Integrating Traffic and Weather Prediction Models on I-80 Corridor

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AASHTO Community of Practice for Road Weather Management - Workshop
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Wyoming Travel and Tourism
Safety and Mobility
Wyoming CV Pilot Deployment Overview

Goals
- Improved safety and mobility along I-80 through real-time communication with fleet drivers and managers
- Improved awareness of hazards through CV pilot applications

Implementation Elements
- 75 Roadside Units (RSUs) broadcasting/receiving messages via DSRC
- 400 equipped vehicles with on-board units (OBUs)
- V2V, V2I, I2V applications alerting drivers to various road conditions
- CV data collection for improved traffic management and traveler information
Analysis, Modeling and Simulation (AMS) Tools and Road Weather

• AMS tools
  - Used to analyze Active Transportation Management (ATM) and other TSMO strategies for mobility improvement
  - Determine existing and predicted traffic conditions under various road weather and operational conditions.

• FHWA is currently implementing AMS tools for weather-responsive management strategies (WRMS) that use mobile and CV road weather data
  - Traveler Information Systems and Variable Speed Limit
  - Plow routing and Anti-icing

• Challenge is integrating CV data with WRMS AMS tool
WRMS, Data, and Tools

- Weather-responsive management and operations strategies are spreading quickly among agencies
- IMO, AVL, and CV data sources are increasing, but not ubiquitous
- Weather-aware simulation tools and applications are still developing
- Wyoming DOT agreed to work with FHWA for this implementation
Wyoming AMS Application

- Partnered with FHWA and Univ. of Wyoming
- Uses I-80 corridor traffic model using VISSIM
- CV data from WYDOT plow trucks
Wyoming I-80 Analysis Corridor

- A portion of the Wyoming CV Pilot corridor on I-80 between Cheyenne and Laramie (mileposts 317 to 340) was developed as a VSL corridor
- Challenging traffic situations: high altitude, adverse weather events, and steep vertical curves
- Model calibrated using WYDOT speed sensor data for various weather conditions, such as clear, moderate, and severe conditions
Calibrated geometrically, including the number of lanes, roadway segment lengths, and grades, the location of lane additions and drops, locations of rest and parking areas.

Traffic control parameters (VSL and other WRMS strategies to be added).

Key traffic parameters: traffic composition, vehicle dynamics data, posted speed limits, the presence of work zones (including location, length, lane closure condition, etc.)
Selected WRMS Strategies

- Snow plow truck pre-positioning (as a variant of plow routing along a corridor or single roadway)
- Enhanced view of VSL (connected VSL)
- Traveler Information System (variable message sign)
- Results of the simulations would be provided to and evaluated by the TMC without any direct integration to their ATMS
Next Steps

- Develop the Implementation Plans for getting CV data, setting up the simulation models, and providing data to each of the sites/agencies
- Work with FHWA to implement the outputs in maintenance and operations (Winter 2019-20)
- Report out implementation results
Hail - Cheyenne - 6.12.2017
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