



Wyoming Department of Transportation (WYDOT) Road Condition Reporting Application for Weather Responsive Traffic Management

Publication #: FHWA-JPO-16-271

Background and Objectives

FHWA's Road Weather Management Program partnered with WYDOT to develop a new software application to improve the way maintenance personnel report road and weather conditions to their statewide Transportation Management Center (TMC), recommend variable speed limit (VSL) changes, and report a number of different traffic incidents including crashes and road hazards.



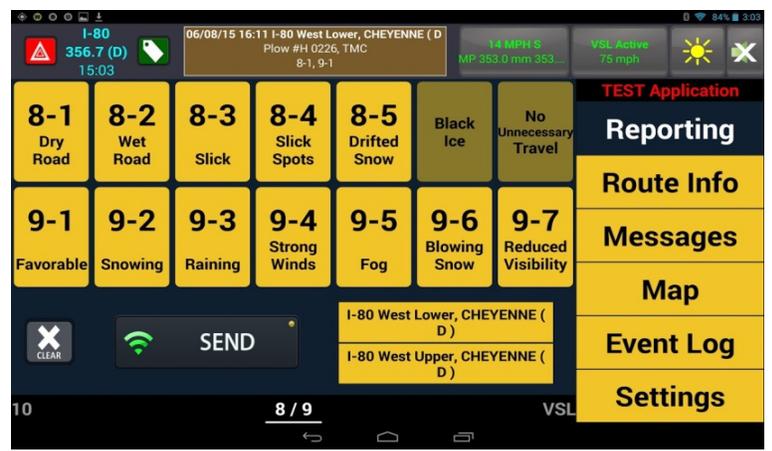
Tablet Computer in a WYDOT Plow Truck (Source: WYDOT)

The primary goal of the WYDOT project was to improve maintenance staff road condition reporting. Specific objectives were to:

- ◆ Improve the efficiency of road condition reporting using a mobile application
- ◆ Improve the efficiency of the TMC operations in taking actions based on the reported road conditions
- ◆ Improve the timeliness of updated traveler information
- ◆ Improve the situational awareness of maintenance staff in the field regarding road weather conditions

Road Condition Reporting Application Description

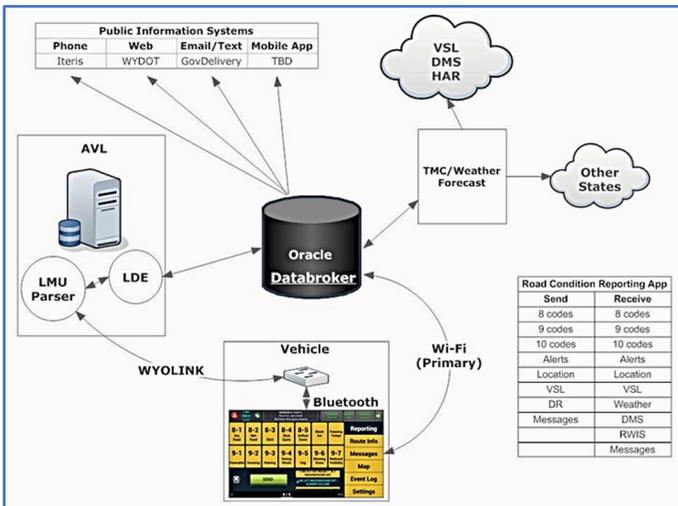
The Road Condition Reporting Application (the "App") was built to run on a tablet computer ("tablet") that utilizes Wyoming's extensive statewide communication system backbone called WyoLink. The App was installed on 20 tablets during the initial deployment used mostly in WYDOT plow trucks on I-80 and portions of I-25 to report road conditions during the 2014-2015 winter season. In addition to the App being used to report road conditions and other information to the TMC, the App is used to share information with maintenance employees, including the road conditions as they are reported to the public, VSL information, weather information, messages posted on dynamic message signs (DMS), and map-based asset location information. It is also used to send and receive messages similar to email.



App Screen on the Tablet (Source: WYDOT)

The implementation also included changes to data management systems in the TMC to accept road condition reports from the tablets and assist TMC operators to perform their duties. The Transportation Reports and Action Console (TRAC) logs all the input from maintenance personnel using the App.

"Anytime, Anywhere Road Weather Information"



Condition Reporting System Data Flow Diagram (Source: WYDOT)

Evaluation

The initial implementation of the road condition reporting App was evaluated to assess its effectiveness and potential in improving Wyoming's road condition reporting and TMC activities. The evaluation focused on four hypotheses associated with the objectives described above. The use of the App improved the effectiveness and efficiency of road condition reporting and TMC activities during weather events. Accuracy of field information was substantially improved - specifically road condition reports, VSL and DMS change requests, and location of incident reporting. Specific evaluation results are as follows:

- The App improved efficiency of condition reporting by maintenance employees and TMC operators:
 - Road reports submitted using the App doubled compared to the standard reporting method.
 - VSL change requests using the App tripled compared to the standard VSL change request method.
 - All maintenance staff survey respondents affirmed the new technology is useful in their operations.
 - 89% of TMC operators surveyed said that the agency is better off with the App.
 - 82% of maintenance staff surveyed indicated that the App was either very easy or easy to use.
- The App improved traffic management capabilities during weather events:
 - The App is easier to use than the radio to communicate recommended VSL and DMS changes to the TMC.
 - More DMS message changes were requested using the App.
 - VSL and DMS changes were more accurate when submitted using the App.
 - 78% of operators surveyed said knowing which DMS to update was easier when requested via the App.

- The App improved the timeliness of condition reporting updates to the public:
 - Twice as many road condition reports were submitted by field maintenance personnel using the App compared to reports submitted over the phone.
 - 64% of maintenance staff surveyed said that using the App they were able to send more reports and field codes, while taking less time on each report.
- The App improved situational awareness of maintenance employees:
 - 73% of maintenance staff survey respondents said they feel more informed about road conditions within their area of operation.
 - 100% said they found the milepost location useful.

Future of the App

WYDOT is planning to incorporate system enhancements to further refine and expand upon the system that was tested and evaluated under this implementation. WYDOT intends to expand the installation of the App in as many as 150 vehicles for the 2015-2016 winter season. Additionally, further development will be completed to integrate the App into existing systems. WYDOT also intends to take advantage of tablet functionality by developing electronic versions of paper forms currently used in maintenance operations, including vehicle inspection and repair requests.

All other photos on this flyer, including the title banner, are courtesy of FHWA.

U.S. Department of Transportation Federal Highway Administration

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