South Dakota Department of Transportation (SDDOT) Regional Traveler Information System for Weather Responsive Traffic Management

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Background and Objectives

FHWA’s Road Weather Management Program partnered with the South Dakota DOT to develop and implement a Weather Responsive Traffic Management (WRTM) strategy that involves mobile data collection and traveler information dissemination during weather events.

The goals of the SDDOT project were to simplify data collection by plow drivers and provide new traveler information to motorists including 24-hour road condition threat forecasts. Specific objectives were to:

- Improve the efficiency of road condition data collection
- Increase the number and frequency of road condition reports
- Improve and expand road weather information provided to travelers
- Enhance the perceived benefits to travelers from the new traveler information
- Support partner agencies that can use the new traveler information

SDDOT System Description

The SDDOT mobile software application allows plow drivers to enter road conditions into the IRIS system directly using Mobile Data Collectors already in the trucks (see top right figure). This improvement provides drivers immediate and direct access to IRIS instead of using the radio to inform a supervisor who would enter the road conditions into IRIS at their desk or the maintenance staff would enter it in the office at the end of a run or shift.

The improved SafeTravelUSA website (see bottom right figure), 511 phone system, and mobile phone applications provide motorists new road condition information. 24-hour road condition forecasts transfer directly from the South Dakota’s Maintenance Decision Support System (MDSS) and to their traveler information systems as possible future “threats” when road conditions might deteriorate to an unsafe situation. For example, the figure shows a forecast of lightly icy road conditions for route SD-63 between junction of Interstate 90 and US 212 west of Eagle Butte between 10PM Thursday and 2AM Friday. The new information also includes expanded types of National Weather System (NWS) alerts and related information.
Evaluation

The initial implementation of the SDDOT WRTM system was evaluated to assess its effectiveness and potential to improve South Dakota’s road condition reporting and dissemination. The results show that the enhanced and expanded information provided to travelers through the SDDOT websites, mobile phone apps, and 511 phone system are not only easy to find and understand (see chart on the right) but can be used by motorists to make prudent travel decisions. Specific evaluation results include:

1. The mobile app could improve efficiency of road condition data collection by SDDOT maintenance forces.
   - Survey indicated they would use the app to:
     o Report road condition changes: 78%
     o Enter road condition reports more efficiently: 74%
     o Describe road conditions more accurately: 83%
     o Report road conditions sooner: 91%
     o Report road conditions more frequently: 78%
   - Survey respondents said benefits would include:
     o Informing and assisting the public with their travel decisions
     o Reporting more often, quickly and accurately
     o Easier and faster condition reports

2. The project will increase the number and frequency of road condition reports. However, this evaluation used hypothetical rather than actual scenarios.

3. The project improved and expanded road weather information to travelers by providing:
   - 97,000 24-hour road condition threat forecasts
   - 42,000 hours of National Weather Service alerts
   - 300,000 website views where 24-hour road condition threat forecasts were available

4. Travelers on South Dakota roads perceived benefits from the expanded and improved traveler information.
   - In an Internet survey of SDDOT traveler information users viewed or listened to 24-hour road condition threat forecasts:
     o Website users: 67%
     o Mobile phone users: 49%
     o 511 phone callers: 36%
   - Respondents finding information to be “quite useful” or “very useful”: 80-87%
   - Survey respondents using the traveler information agreed or strongly agreed that their travel plans were affected:
     o Changed the timing of their travel: 60%
     o Changed the routing of their travel: 53%
     o Felt more prepared for their travel: 76%

Future System Enhancement

SDDOT will continue providing 24-hour road condition threat forecasts and NWS alerts. SDDOT is also planning to deploy the IRIS application in plow vehicles to improve road condition reporting throughout the State. Additionally, SDDOT will continue monitoring and evaluating these new features to improve the collection and dissemination of essential traveler information.

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