



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

Publication #: FHWA-JPO-16-325

## 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

Routes	Conditions	Visibility	Restrictions	Expiration
US14: Jct US81 at Arlington to Volga	Winter Maintenance Suspended; Snow Covered	Not Impacting Visibility; Fog	Road Blocked	Thu Mar 12 23:07:46 CDT 2015
US14: Volga to Brookings East City Limits	Dry	Less Than 1/4 Mile; Snow, Scattered		Thu Mar 12 19:05:18 CDT 2015
US14: Brookings East City Limits to Minnesota State Line	Dry	Not Impacting Visibility		Tue Mar 10 21:01:08 CDT 2015
US14B: Jct US14 west of Brookings to Jct US14 east of Brookings	Dry	Not Impacting Visibility		Wed Mar 11 19:50:31 CDT 2015
I29: Ward Exit to Jct US14 at Brookings	Dry	Not Impacting Visibility		Mon Mar 9 22:51:18 CDT 2015

SDDOT Mobile Data Collection (MDC) Application (Source: SDDOT)

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.

**24 Hour Threat Forecast**  
 (What is this?) The following road condition threats are forecasted for 10PM MST Thu through 13AM MST Fri. Actual road conditions may vary from this forecast. Motorists are cautioned to be alert to changing conditions.

- From Junction Interstate 90 East to Junction US 14 (West Midland)
  - lightly icy road conditions possible between approximately 10PM Thu and 2AM Fri.
- From Junction US 14 West Midland to Junction US 14 East
  - lightly icy road conditions possible between approximately 10PM Thu and 8AM Fri.
- From Junction South Dakota 24 West to Junction US 212 west of Eagle Butte
  - lightly icy road conditions possible between approximately 10PM Thu and 8AM Fri.

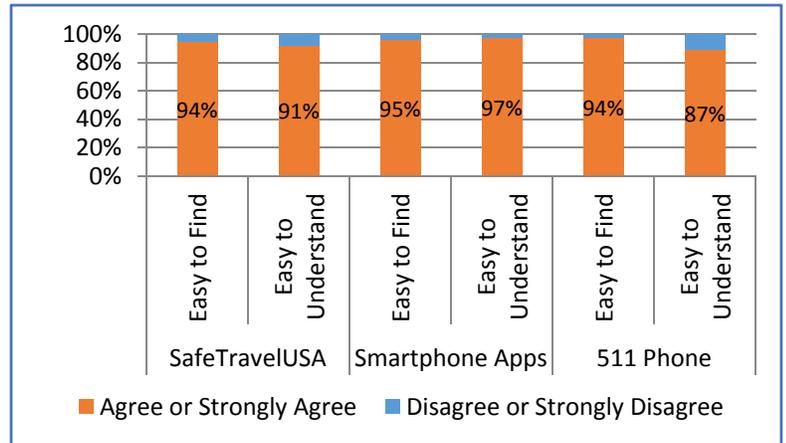
SDDOT SafeTravelUSA website with 24-hour Road Condition Forecasts (Source: SDDOT)

*"Anytime, Anywhere Road Weather 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:
    - Report road condition changes: 78%
    - Enter road condition reports more efficiently: 74%
    - Describe road conditions more accurately: 83%
    - Report road conditions sooner: 91%
    - Report road conditions more frequently: 78%
  - ◆ Survey respondents said benefits would include:
    - Informing and assisting the public with their travel decisions
    - Reporting more often, quickly and accurately
    - 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:
    - Website users: 67%
    - Mobile phone users: 49%
    - 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:
    - Changed the timing of their travel: 60%
    - Changed the routing of their travel: 53%
    - Felt more prepared for their travel: 76%



Web-based Survey Responses Regarding 24-Hour Road Condition Threat Forecasts (Source: Battelle/McFarland Mgmt.)

## 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.

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

## U.S. Department of Transportation Federal Highway Administration

Road Weather Management Program  
1200 New Jersey Avenue, E86-318  
Washington DC 20590

Roemer Alfelor, FHWA  
Weather Responsive Traffic Management Program Manager  
roemer.alfelor@dot.gov  
202-366-9242

David Huft, SDDOT  
Research Program Manager  
dave.huft@state.sd.us  
605-773-3358



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