Citizen Reporting Program for Road Weather Information at Utah Department of Transportation

Background

The FHWA Road Weather Management Program partnered with Utah DOT to develop and implement advanced traveler information strategies during weather events. UDOT already has one of the most sophisticated Traffic Operations Centers (TOCs) in the country in terms of how they obtain and integrate road weather information with traffic management decisions and traveler information dissemination (see Figure 1). UDOT currently has a robust road weather condition and forecasting system that provides information to the traveling public through several dissemination methods. As part of this implementation, UDOT focused on the initial deployment of a citizen reporting program, and improvements to their traveler information website (UDOT Traffic) and mobile applications.

Utah DOT Traveler Information System Project Objectives

The primary goal of Utah DOT Weather Responsive Traveler Information project is to provide both TOC operators and travelers with more accurate and timely road weather and travel impact condition information and forecasts. Specific objectives were to:

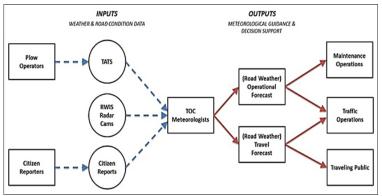♦ Develop and implement a citizen reporting program for weather.

Figure 1. Weather Data Flow and Integration at Utah Traffic Operations Center *(Source: Utah DOT)*

♦ Increase the frequency of weather forecasts from 6 hour increments, 18 hours in the future (3 forecasts) to 3 hour increments, 24 hours in the future (8 forecasts).

♦ Provide road weather forecasts for 6 state routes of significance in addition to the 7 interstates and US highways already receiving public forecasts.

♦ Make appropriate software changes to manage the additional data and forecasts and dis-

Figure 2. Utah DOT Traffic Operations Website *(Source: Utah DOT)*

seminate them to travelers using the UDOT Traffic website (see Figure 2), 511 phone system, and smartphone applications.

Citizen Reporting Program Description

The citizen reporting program developed uses the current UDOT Traffic smartphone applications to allow citizens to report back to UDOT conditions on their roadways. For the initial system, a separate smartphone citizen reporting app was developed. Moreover, it included UDOT employees only as field reporters.

The main functions of the citizen reporting program are to:

♦ Generate road weather reports at a minimum of every 2 hours for some or all of the roadway segments identified by UDOT

♦ Provide fresher data and better coverage on rural roadways

♦ Support Section 1201 requirements by providing real-time reporting on roads throughout the state

♦ Actively control weather quality reports using staff meteorologists

♦ Provide quality assurance through a reporter selection process and training

♦ Provide more information at a fraction of the cost of other alternatives

♦ Indirectly improve forecasts by providing meteorologists with more and better field data.

Software development allowed the data to be effectively used by the traffic operators, maintenance dispatchers, and disseminated to the traveling public– each reporter was trained on how to record observations and submit reports. Additional meteorology staff was added to provide the enhanced forecasts on existing and new state roadways.

Citizen Reporting Mobile Application

The Citizen Reporting Program involves deploying citizen reporters to provide road weather conditions to help fill gaps in

Figure 3. Citizen Reporting IPhone Application
(Source: Utah DOT)

the existing road condition reports and support more timely and accurate forecasts. The citizen reports are not expected to replace existing infrastructure sources or information from the maintenance field personnel. Rather, these reports provide an important supplemental dataset to the UDOT forecast, operations and maintenance staff. UDOT developed a smartphone application (iPhone and Android) as shown on the left to facilitate reporters submitting reports on their road weather observations. An extensive training program was delivered to assist the reporters on how to report road conditions.

Evaluation

The Initial Citizen Reporter Program was evaluated to assess its effectiveness and potential to supplement UDOT's existing systems for gathering and disseminating road weather information. The evaluation addressed five testable hypotheses (see Table 1 on the right) along with a summary of the main results associated with each hypothesis.

This project underscored UDOT's efforts to raise awareness on the challenges to safe driving during adverse weather and the benefits offered by new tools and better information to aid travelers. The addition of citizen reports will help fill gaps in available road weather data, provide "fresher" data than has been available in the past, support UDOT's plans to enhance their road weather forecasts, and help meet state and national transportation goals for safety and mobility during weather events.

Future of the Program

The UDOT Citizen Reporter Program has successfully transitioned from an FHWA/UDOT Pilot Partnership to a UDOT-managed program. UDOT is launching the program to the general public on November 2013 and is soliciting volunteers through partnerships with other agencies and organizations like the Utah Trucking Association and the Utah Highway Patrol.

Hypothesis	Evaluation Results
1. Citizen reports will help fill observation gaps, spatially and temporally	♦ Most of the trained reporters actively submitted reports. ♦ Reports were submitted for primary, secondary and tertiary road segments ♦ An average of 8.5 reports were submitted per day on storm days
2. Citizen reports will provide accurate and timely information to UDOT	♦ Citizen reports were 99+% accurate ♦ On storm days, the submittal rate with no delay is 76%.
3. Internal UDOT operations will benefit from increased road condition reports and forecasts	♦ Interviews with UDOT staff indicated that citizen reports provided increased situational awareness for meteorologists and TOC operators. ♦ Citizen reports increased confidence in road weather forecasts.
4. The traveling public will make more informed decisions based on the new information	♦ UDOT survey indicated 35%-50% benefited indirectly from local media for storm information to support their travel decisions; 5%-10% used UDOT traffic forecasts directly. UDOT shares information with the local media.
5. The traveling public will perceive a benefit from the enhanced information	♦ As part of two post storm surveys, 83% to 95% of respondents said they were satisfied with UDOT's road weather forecasts and the traffic app/website. ♦ Two focus group sessions revealed frequent use of the UDOT traffic app during storms, and the citizen reporter program is viewed as useful and providing accurate information.

Table 1. Evaluation of the citizen reporting program

All photos unless otherwise attributed are courtesy of the Federal Highway Administration Road Weather Management Program.

"Anytime, Anywhere Road Weather Information"

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