

Evaluation of Utah Department of Transportation's Weather Operations/RWIS Program: Phase I

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EXECUTIVE SUMMARY

The Utah Department of Transportation has taken a notable step forward in handling the challenges of weather through the creation of its Weather Operations/RWIS Program. Nationally unique, the program assists the DOT operations, maintenance, and construction functions by providing detailed, often customized, area-specific weather forecasts.

Established under the UDOT Traffic Management Division, the program has two main components. First, the Weather Operations component features four staff meteorologists stationed in the Traffic Operations Center (TOC), providing year-round weather support for winter maintenance, road construction and rehabilitation projects, TOC operations, the Highway Avalanche Safety Program, planning, risk management, training, and incident management. Weather briefings are conducted in the TOC on a daily basis, involving TOC personnel, area supervisors, and maintenance foremen. In addition, the program provides tailored crew-specific forecasts in a text format for all 82 maintenance sheds. The program also has an intelligent transportation systems (ITS) component, which manages 48 RWIS stations and expert systems such as bridge spray systems, high wind alerts, and fog warnings.

The program provides pre-storm, during-storm, and post-storm weather forecasts to the maintenance engineers, area supervisors and local sheds. Forecasts are distributed in daily e-mail text bulletins and on the Internet, and area supervisors or shed foremen may consult meteorologists by telephone for “nowcasts”. The forecasts are tailored to the users’ needs, addressing issues such as the timing of events, temperature trends and precipitation rates. The program also provides longer-term forecasts, which can assist construction engineers and contractors with planning their projects.

UDOT contracted with the Western Transportation Institute to evaluate the benefits of the program. The evaluation focused on quantifying the benefits and costs of improved forecasts for winter maintenance, as well as interviewing construction engineers and maintenance personnel regarding their usage of and experience with the program. The evaluation found the following:

- Seventy-six percent of interview respondents said that UDOT’s forecasts were more reliable than other weather information services, and 85 percent said that they were more usable.
- Ninety percent of respondents indicated that the program provided a better level of service than other weather information services
- Nearly 80 percent of the maintenance personnel respondents reported changing their approach to winter maintenance with the aid of these weather forecasts.
- Based on the results of an artificial neural network model, the UDOT’s Weather Operations Program is estimated to save UDOT maintenance sheds \$2.2 million per year in labor and materials costs for snow and ice control, which corresponds to a benefit-cost ratio of 10:1 (as the annual budget for the program is \$200,000).