



# Road Weather Management Performance Measures

## *A Way to Measure Achievement*

### Background

The 2005 Safe, Accountable, Flexible, Efficient, Transportation Equity Act – A Legacy for Users (SAFETEA-LU) established, under the ITS research program, a Road Weather Research and Development Program and directed the Road Weather Management Program (RWMP) to assess how well the program is meeting three primary goals:

- Maximizing the use of available road weather information and technologies;
- Expanding road weather research and development efforts to enhance roadway safety, capacity, and efficiency while minimizing environmental impacts; and
- Promoting technology transfer of effective road weather scientific and technological advancements.

To meet those goals, the RWMP established meaningful, understandable, and practical measures of performance to evaluate the social, scientific, and organizational benefits of RWMP products and activities such as *Clarus*, the Maintenance Decision Support System (MDSS), and Weather Responsive Traffic Management (WRTM). Following is a description on how those measures were developed.



*Photo courtesy of U.S. DOT Road Weather Management Program*

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*The result is useful, meaningful, and practical performance measures that can be used to evaluate and communicate the success of the RWMP.*

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### Performance Measures Study

A performance measure study was initiated in late 2006 that involved an extensive literature search and a review of performance measures used by U.S. Department of Transportation (DOT) agencies as well as those from the National Oceanic and Atmospheric Administration (NOAA) and the Federal Aviation Administration (FAA).

Considerable input was obtained from a wide variety of stakeholders. An initial list of 120 output and outcome measures were presented to a group of stakeholders during a DOT-sponsored workshop in April 2007. Based on workshop recommendations, 60 outcome measures were distributed to over 250 public and private stakeholders for further review and comment.

U.S. DOT received over 760 comments that were synthesized into a matrix of 66 outcome measures and then prioritized based on the following criteria:

- Relevance to SAFETEA-LU goals and RWMP program objectives;
- The level of support from stakeholders;
- The availability of data; and
- Ease of implementation.

### Implementation

The careful review and selection process resulted in eleven performance measures grouped by the SAFETEA-LU goals that will be used to evaluate and communicate the success of the RWMP. Those measures are described on page 2.



*Photo courtesy of Texas Department of Transportation*

The program has developed and is implementing a plan to define the meaning, scope, data requirements, and possible further modifications for each measure. The plan includes the data collection and analysis procedures for quantifying the measures and relating them to the products and activities of the RWMP such as *Clarus*, MDSS, Maintenance and Operations Decision Support Systems (MODSS), WRTM, Vehicle Infrastructure Integration (VII), and Traffic Management Center (TMC) Weather Integration.

A strategy for how the quantified metrics will communicate and monitor the success in meeting RWMP current and future program goals is also part of the plan. The first assessment of these measures will be completed in 2009.

***“Anytime, Anywhere Road Weather Information”***

## Road Weather Management Program Performance Measures

### Goal 1: Maximize use of available road weather information and technologies.

- Number or percentage of transportation agencies that use road weather information and decision support systems (based on current or forecast information) for making advisory, control, and treatment decisions. Relevant RWMP Programs – Clarus, MDSS, MODSS, WRTM.
- Number or percentage of travelers who use road weather information for making travel decisions (both pretrip and enroute). Relevant RWMP Programs – Clarus, WRTM, VII, TMC Weather Integration.
- Number of environmental sensor stations (ESS) deployed and used by transportation agencies to support decision-making (normalized by total area or length of road network). Relevant RWMP Programs – ESS Siting Guidelines, Clarus, MDSS.



Photo courtesy of U.S. Department of Transportation Road Weather Management Program

### Goal 2: Expand road weather research and development efforts to enhance roadway safety, capacity, and efficiency while minimizing environmental impacts.

- Number of agencies participating in and benefiting from road weather R&D projects. Relevant RWMP Programs – All RWMP R&D projects.
- Percentage of time a roadway meets safety and capacity level of service (LOS) standards (i.e. V/C ratio, etc.) during and after weather events (normalized by the frequency/intensity of winter events). Relevant RWMP Programs – All R&D, particularly MDSS, MODSS, WRTM.
- Reduction in agency costs (i.e. labor, equipment, materials) due to adoption of maintenance and operations decision-support systems for road weather management. Relevant RWMP Programs – All R&D particularly MDSS, MODSS, WRTM.
- Reduction in user costs (i.e. delay, crashes, vehicle operating costs, emissions, salt damage) due to improved road weather advisory, control, and treatment strategies. Relevant RWMP Programs – All R&D particularly MDSS, MODSS, WRTM.

### Goal 3: Promote technology transfer of effective road weather scientific and technological advances.

- Number of agencies/individuals visited or contacted through technology transfer, training, and outreach efforts. Relevant RWMP Programs – All tech transfer, training, and outreach activities.
- Rate of adoption of RWMP technologies (e.g., decision-support systems) by agencies that participated in workshop or training activities. Relevant RWMP Programs – All tech transfer, training, and outreach activities.
- Number of RWMP technology development, testing, and deployment activities initiated through public or private sector based on identified operational needs. Relevant RWMP Programs – All tech transfer, training, and outreach activities.
- Number of road weather technologies developed through public-private and/or public-public partnerships reaching operational deployment. Relevant RWMP Programs – All tech transfer, training and outreach activities.



Photo courtesy of the Pennsylvania Department of Transportation



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