ITS Sheet 5

Road Weather Information Systems

NATIONAL ASSOCIATIONS WORKING GROUP FOR ITS

Road Weather Management: Better Information and Tools Improve Operations, Save Lives

"Everybody talks about the weather, but nobody does anything about it."

—Robert Underwood Johnson

Yes, no one can change the weather, but Federal, State, and local transportation agencies are working together to reduce the effect that weather conditions have on mobility and safety. Traffic congestion resulting from rain, snow, wind, and reduced visibility costs travelers hours of delay and inconvenience. Estimates of the consequence of a one-day highway shutdown due to snow in a major metropolitan area range from $15 to $76 million in lost time, productivity, and wages. On top of all this, salt and other chemicals used for ice control end up running off into waterways, and abrasives used to improve traction can clog streams or contribute to particulate air pollution.

Research indicates travelers want more timely and accurate information about road and weather conditions. They want detailed, location-specific forecasts and situation reports. They also need multiple ways of getting the information—radio and TV, conventional and cellular telephone, pager, and the Internet. New technologies can improve information systems, maintenance tools, and road weather management practices. This will help transportation officials reduce weather-related costs, provide more accurate and up-to-date information to the public, and decrease the number of weather-related traffic injuries and fatalities.

Each year adverse weather conditions cause 7,000 traffic fatalities and 450,000 injuries. Transportation agencies spend about $2 billion annually for snow and ice control, and $5 billion for infrastructure repair attributable to weather.

Anticipating Surface Transportation Weather is a High Priority

Improving road weather information and its availability allows the public to make better travel decisions. Working with partnership organizations, the Federal Highway Administration (FHWA) has completed an initial draft of information requirements for surface transportation weather, focusing on winter maintenance operations decisions. Over the next year FHWA will continue to gather requirements and to update the document. FHWA and its partners will then work with the Office of the Federal Coordinator for Meteorology, the National Weather Service, and the Department of Defense to develop standards and weather products and services that meet the needs of the highway community. The ultimate objective is to make surface transportation weather services as high a priority as aviation weather services.

State departments of transportation, FHWA, and other partners are developing a decision support tool to help system managers provide better data for deployment of winter weather maintenance

Weather management information gets the right equipment to the right site.

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resources. This tool will process, filter, and aggregate weather information, and present it in the context of the highway environment. Over the next few years FHWA and its partners will prototype and field-test the tool. Future enhancements will include capabilities for travelers, traffic managers, and emergency management agencies.

Road Weather Information Systems and ITS

Several states are using road weather information systems (RWIS) for surface transportation weather management. These systems have improved the efficiency of snow and ice control operations and have reduced accidents. Uses include:

- Indicate when snow and ice control operations are required
- Supplement tracking systems for weather conditions affecting year-round maintenance and traffic operations
- Indicate the need for traffic advisories, warnings, or restrictions
- Allow automatic hazard warning
- Provide site-specific weather and surface temperature forecasts to facilitate crew scheduling and assignments
- Allow automatic operation of permanently installed anti-icing chemical spray systems on bridges and at other critical locations
- Provide a climatological data base for designing mitigation measures for blowing snow
- Provide current road and travel information to the public.

Specialized equipment and computer programs help RWIS to monitor air and pavement temperatures and predict whether precipitation will freeze on the pavement. Sensors collect data on air and pavement temperatures, precipitation, and the amount of de-icing chemicals on the pavement. These observations feed value-added meteorological services to enable them to predict pavement temperatures for a specific area, such as a mountain pass, over a 24-hour period.

The highway agency's winter maintenance offices then use RWIS predictions to determine the optimum time to apply chemicals—about an hour before the pavement reaches freezing temperatures. Treatment prevents ice from forming on the pavement, avoiding the need to clear the ice after it has already bonded to the pavement. These carefully timed treatments have proven to be a cost-effective means of snow and ice control.

In the future, road weather information systems will be integrated with other intelligent transportation systems. Transportation management centers will become road weather command centers. They will respond to adverse weather conditions and rely on computer-aided dispatch and automatic vehicle location to improve the deployment of snow and ice removal resources. They will use maintenance vehicles equipped with mobile road condition sensors that automatically control treatment applications and report road status back to base. Transportation officials will use signal timing algorithms and other management tools based on weather. Travelers will decide whether to go, how to go, and which way to go using up-to-date information given to them by their choice of communication mechanisms.

Controlling ice and snow can help travelers and save lives.

For more information...

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