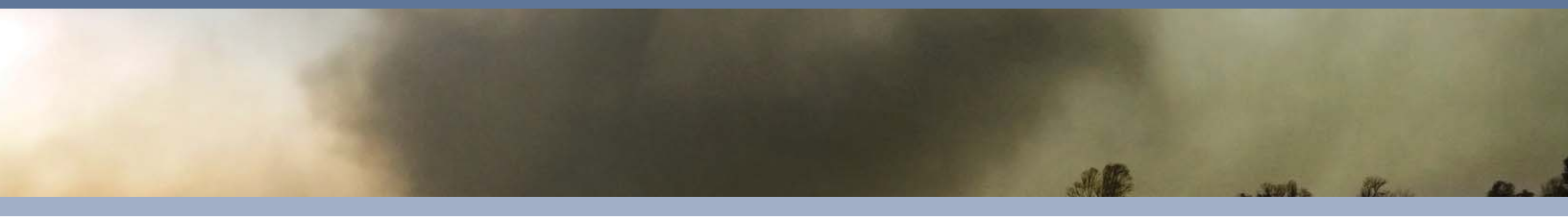
Baselining Current Road Weather Information

Characterizing Sources and Evaluating Attributes



The Federal Highway Administration (FHWA) Road Weather Management Program (RWMP) recently completed Baselining Current Road Weather Information, a study to establish a baseline for current road weather information. The baseline characterizes sources and evaluates the quality attributes of road weather parameters used by transportation agencies.

Background

Varying levels of quality characterize existing sources of road weather information. These can often paint an incomplete or inaccurate picture of conditions on or near the road surface, which are documented in the 2004 National Research Council report *Where the Weather Meets the Road: A Research Agenda for Improving Road Weather Services*.

To overcome these deficiencies and improve road weather information products, the U.S. Department of Transportation (DOT) is investing in Intelligent Transportation Systems (ITS) research. One of the road weather ITS initiatives is *Clarus*, an integrated surface transportation weather observing, forecasting, and data management system.

Clarus enables public and private information providers to produce *anytime, anywhere road weather information* to meet the needs of all road users and operators. Using *Clarus* will ultimately help improve mobility and safety by alleviating the impacts of adverse weather on the surface transportation system.

Baselining serves as a reference to compare the results when agencies and organizations use Clarus and other advanced road weather management technologies.

Baselining road weather information establishes a reference to compare the results when agencies and organizations use *Clarus* and other advanced road weather management technologies.

By characterizing existing weather information, the results may be used by all surface transportation weather users and providers as a benchmark for measuring improvements over time.

Identification of RWMP Baselines

The RWMP baseline study focused on the content and usefulness of road weather information as evaluated by transportation agencies presently using this information for advisory, control, and treatment strategies in response to inclement weather.

Road weather information can help determine treatment applications that can be applied to the roadway via trucks as shown above. Photo courtesy of the Road Weather Management Program.

The characterization used attributes the majority of users felt were important and those that directly applied to weather information and associated products. The result was the identification of the following six quality attributes:

- **Accuracy/Precision –** The "closeness" between an observed or forecasted condition and the actual condition;
- **Completeness –** Whether there was adequate information to fulfill users' requirements;
- **Relevance –** The fit of the information to the users' needs;
- **Currency/Latency –** The age of the information;
- **Timeliness/Reliability –** Whether there was consistent and on-time delivery of information; and
- **Ease of Use –** Whether it was easy to obtain, interpret, and use the information.

Results of Baselining

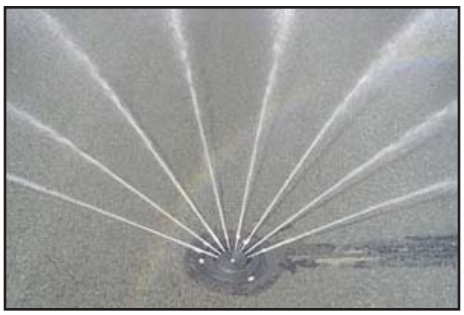
In baselining the six quality attributes, the study characterized a broad spectrum of 16 Product Types and 45 Road Weather Elements. The Product Types describe a packaged collection of road weather information, and the Road Weather Elements include individual pieces of information that are either contained in a product type or reported individually.

The quality assessment identified certain road weather elements such as pavement temperature, road closure, severe weather watches and warnings, and advisory messages that have high quality ratings. Other road weather elements such as cloud cover and pavement chemical concentration have lesser quality.

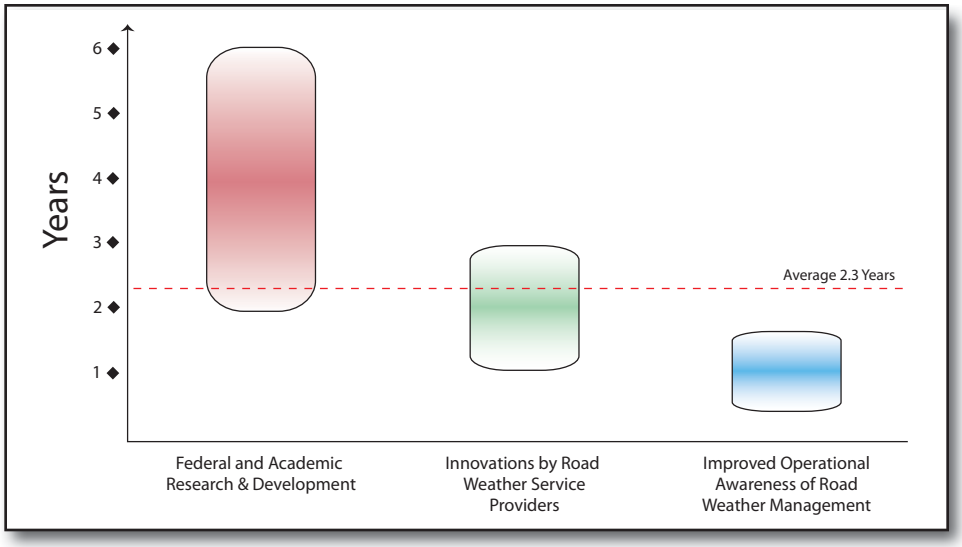
Anticipated Outcomes

Benefits of the baselining effort can be achieved through ongoing monitoring at roughly two year intervals. This monitoring will show the impact of road weather activities as they evolve over time.

Although the present quality levels are considered by users to be reasonably high, there definitely exists room for improvement. The anticipated outcomes of ongoing monitoring include the following:



This photo shows the application of a deicing spray on an icy pavement. Good quality road weather condition information is needed to determine the correct amount and concentration of chemicals to use. Photo courtesy of the Road Weather Management Program.



This chart shows the time intervals of road weather technology initiatives and growth along with the recommended frequency for re-evaluation of road weather information quality (red dashed line). Graph courtesy of the Road Weather Management Program.

- Improved road weather observations;
- Improved traveler advisory messages;
- Improved winter maintenance tactical response to snow and ice conditions;
- Improved responsiveness by traffic managers on placing weather-related traffic controls;
- Higher quality road weather products provided by the road weather service provider community;
- Greater confidence by transportation personnel in road weather products and services;
- Incentives for improvement of instrumentation or processing to address elements perceived as low quality resources; and
- Continuing System Improvement for Road Weather Information Products.

Developing confidence in road weather information requires assurance of quality information. How well this confidence is achieved will be found in the changes in road weather information quality characteristics.

Ongoing monitoring will provide a road weather community "report card" and indicate needed improvements.

All photos courtesy of Road Weather Management Program

U.S. Department of Transportation
Road Weather Management
1200 New Jersey Avenue, E86-205
Washington, DC 20590

Roemer M. Alfelor
202-366-9242
E-mail: roemer.alfelor@dot.gov
http://ops.fhwa.dot.gov/Weather/index.aps

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