

## **TR-404 Maximizing the Use of Roadway Weather Information Systems**

**KeyWords:** RWIS, Roadway Weather Information Systems, NWS, National Weather Service

### **ABSTRACT**

The object of this project was to make recommendations to the Iowa DOT (IaDOT) on more effective uses of Roadway Weather Information Systems (RWIS) data in winter highway maintenance decisions. We first recommend one site be placed on a paved surface that is not part of a traveled roadway to provide a test site for on going research and demonstration on use of RWIS data.

From the results of the survey and discussions with supervisors, it is clear that graphical displays of data are needed to more effectively communicate information to end-users. The survey furthermore gave evidence that Automated Weather Observing Station (AWOS) data are being under utilized, again in part because of lack of recognition of the value of these tabular data. Better visual displays of pavement temperature and weather information in general would facilitate decision making by maintenance personnel. Also, the RWIS indicator that reports the presence of frost does not distinguish microscopic frost accumulations that are of no consequence to safety, from large accumulations that significantly reduce friction. Maintenance personnel therefore have no way of distinguishing the presence of significant frost. There is a need to have AWOS stations upgraded to include precipitation reports. Procedures need to be developed to effectively archive measurements for follow on studies to further refine use of meteorological data.

Data and information from the National Weather Service (NWS) should be more directly incorporated into the IaDOT data stream, as should AWOS data. In particular, the current coding impediments to getting the NWS nowcasts on the Data Transmission Network (DTN) should be removed so that garages will have access to one of the most useful locally generated, publicly available short term forecast products. Most importantly, all data should be blended as seamlessly as possible so users do not need some special code for accessing and displaying different types of data.

Survey results indicated that most supervisors are properly using meteorological data available to them during the 24 hours preceding a storm, and they find the DTN system to be especially helpful, probably because of its primarily graphical display of data. As an event begins, they appropriately rely heavily on radar data, but are not making optimum use of other types of data that would assist decision making, such as AWOS and NWS warnings and special weather statements. Scenario based training exercises should

be used to improve the flow of weather data, information, and response actions during storm conditions. Also, because real time reports of snowfall amount are sparse among traditional weather data sources, an internal system of measuring and relaying snowfall at garages should be established to assist in response and later forecast verification.

Educational and training programs are needed on use of AWOS data, use of pavement temperatures, and interpretation of radar. Videotapes are judged to be the most practical way at present to offer these programs, but interactive CD ROM or Internet learning modules would be better in the longer term.

There are legal limitations on current pavement conditions that can be disseminated to the public. A limited amount of RWIS pavement temperature data now is available on the Internet. When the data dissemination system ultimately is migrated more fully to the Internet, data should be widely available to the general public.

The full spectrum of weather data, with recommended improvements, should be available to and their use strongly encouraged for cities and counties. Training programs and videos will be just as important at the city county level as at the state level. Results of our intercomparison of RWIS pavement temperatures give examples of temperature variability from city to city and city to rural area. These can be used as a basis for estimating city/county pavement temperatures from measurements on state roadways. Data from RWIS and AWOS sites could be combined with agricultural and environmental measurements to provide a comprehensive resource for public safety, disaster preparedness, environmental management, and economic development.