2010-SPR-3(042)TS
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TRANSPORTATION POOLED FUND PROGRAM

TECHNICAL SUMMARY

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TOTAL STATE CONTRIBUTIONS TO DATE:

$3,317,500

Mn/DOT CONTRIBUTIONS TO DATE:

$375,000

PARTICIPATING STATES AND REGIONS:

AK, IL, IN, IA, MI, MN, NV, NY, ND, OH, PA, UT, VA, WI, QUEBEC, ONTARIO AND SWEDEN

Roadway sensors measure conductivity to assess when road surface conditions change and the presence and concentrations of anti-icing chemicals.

RESEARCH SERVICES

OFFICE OF POLICY ANALYSIS, RESEARCH & INNOVATION

Pooling Our Research: Developing Technologies to Predict Winter Road Conditions

SPR-3(042): Aurora Program Pooled Fund Study. *Aurora is an internationally recognized leader in the research and development of road and weather information systems, including winter and pavement condition forecasting technologies. Mn/DOT has been a member of this program since its inception in 1996.*

Why a Pooled Fund Study?

Each winter, Mn/DOT and Minnesota's local transportation agencies protect drivers from the hazards of snowy and icy roads by pretreating pavements with anti-icing chemicals, deploying snowplows and other maintenance equipment, and alerting travelers via roadway warning systems. Effective protection of drivers requires proactive decisions by road agencies that are fine-tuned to current weather and road conditions, and these decisions depend in turn on a combination of technologies referred to as Road Weather Information Systems, or RWIS.

RWIS technologies include environmental stations around the state that collect atmospheric weather data such as temperature and humidity, and roadside sensors that collect information about pavement and underlying soil temperatures, water levels and icing. This data is processed and made available to transportation agencies and the traveling public.

To receive maximum benefit from these technologies, Mn/DOT joined an international partnership dedicated to their development. The Aurora Program was founded in 1996 to bring together transportation agencies, universities and weather services for collaboration on RWIS research, development, deployment and technology transfer. Seventeen state DOTs and other agencies each contribute $25,000 annually to this study. Agency representatives include international leaders in RWIS technologies, many of whom are also affiliated with AASHTO's Snow and Ice Pooled Fund Cooperative Program and related programs.

What is the Pooled Fund Study's Goal?

The goal of the Aurora Program is to develop RWIS technologies that significantly reduce the adverse impacts of inclement weather on mobility and public safety.

What Have We Learned?

Since the inception of Aurora, more than 30 research efforts have been completed, including two initiated by Mn/DOT:

- Support of the MDSS Pooled Fund Study, which provided funding to develop and test the Maintenance Decision Support System as an operational tool in member states.
- RWIS Equipment Monitoring System—Phase I, developed to provide Aurora member agencies with an automated means of identifying and reporting problems with their RWIS equipment. This Web-based solution was based on an existing Mn/DOT system and routes users to the right technician immediately, saving them significant amounts of time when it comes to maintaining their RWIS technologies.

Even those projects not initiated by Mn/DOT are often highly beneficial to Minnesota and typically include Mn/DOT participation of the project team. Two recently completed projects of particular interest to Mn/DOT were:

continued

"Many of Mn/DOT's improvements to its RWIS systems have come from Aurora projects or ideas, including the use of network cameras to provide cheap, reliable images at our sites."

–Curt Pape,
Mn/DOT Road Weather Information Systems Coordinator

"Aurora is internationally recognized as a leader in the snow and ice community, providing invaluable knowledge critical to efficient winter maintenance operations."

–Sue Lodahl,
Mn/DOT Assistant State Maintenance Engineer

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RWIS technologies use weather stations to supply temperature, visibility and other data so agencies can inform the public and make decisions about winter maintenance operations.

- Pavement Temperature Sensor Accuracy, which was conducted at the MnROAD facility to evaluate the accuracy of various pavement temperature sensors.
- Computer-Based Training Development, an interactive training program for winter operations that included segments on RWIS, anti-icing, deicing chemicals and other related aspects of winter operations.

Mn/DOT RWIS coordinator Curt Pape sees the value in being a member of a national team that sets the agenda for winter maintenance and RWIS research, having used the opportunity to develop relationships with national and international leaders in RWIS equipment, decision support systems, standards and training. "We use their collective knowledge to help solve our issues and plan for the future," said Pape. "There is nowhere else you can go to get the kind of detailed road and weather knowledge available to Aurora participants."

What's Going On Now?

The following are among the more than 30 ongoing projects by Aurora:

- Benchmarking the Performance of RWIS Forecasts is reviewing the state of the art within the meteorological community with regard to measuring the performance of weather forecasting information.
- Support of the Clarus Initiative is helping to guide and implement the federal project that establishes a vision for leveraging local and regional road, rail and marine weather observations.
- Mobile Weather and Road Condition Reporting is developing an RWIS technology that collects data electronically from remote statewide locations for delivery in real time.

What's Next?

Each year, Aurora Program participants develop a number of new project ideas, which are then reviewed by the program members for areas of common interest. Through this process, an annual work plan is developed that outlines the projects to be funded in the coming year. As it moves ahead, the program is expected to remain an internationally recognized leader in RWIS and an important resource for Mn/DOT, improving the safety of Minnesota's roads and reducing the costs of winter maintenance and related activities for all of Minnesota's transportation agencies.

This Technical Summary pertains to the ongoing Pooled Fund SPR-3(042), Aurora Program. Details of this effort can be found at http://www.pooledfund.org/projectdetails.asp?id=189&status=4 *and* www.aurora-program.org/.

For more than 25 years, FHWA's Transportation Pooled Fund Program has been providing state DOTs and other organizations the opportunity to collaborate in solving transportation-related problems. The TPF Program is focused on leveraging limited funds, avoiding duplication of effort, undertaking large-scale projects and achieving broader dissemination of results on issues of regional and national interest.