Known for cold temperatures and snow and ice that can last from November through April, winter is the signature season of Minnesota. Ice on roadways, especially black ice, can create a hazard for the most experienced drivers. When moisture is present, ice can quickly form on cold pavement.

Experienced highway maintenance staff quickly identify problem areas within their districts. MnDOT District 8 staff recognized that a section of US Highway 12 near the City of Cokato experienced a phenomenon that they called “Blow Ice.” When the wind blows snow across this section of Highway 12, ice forms on the roadway creating an unexpected hazard for drivers. This section of highway is in a rural area, with little to protect the roadway from the blowing snow. In the past, the District has tried to minimize the impact of the “Blow Ice” effect by installing living and traditional snow fences with limited success.

Working with the MnDOT Office of Traffic, Safety and Technology ITS staff, a project was launched to design an innovative solution to minimize the impact to drivers in this area. Based on input from the various stakeholders, SRF Consulting Group, Inc. was awarded a contract to develop the Concept of Operations and System Requirements document. Based on the solution proposed by SRF, Boschung America, working with project collaborators, proposed a system featuring:

- three in-pavement IT-SENS® pavement sensors from Boschung America
- PTZ camera
- active warning signs with flashing beacons upstream of the area where the ice develops to warn travelers

Application – Using Pavement Sensors to Automate Ice Warning Systems
System Owner – Minnesota DOT District 8
Sensors Used – IT-Sens WSS Basic Passive Pavement Sensor
Project Collaborators – Dan Rowe - MNDOT District 8, Scott Petersen - SRF Consulting Group, John Markham - Campbell Scientific, Eric Cottone - Boschung America

Ice on roadways is a significant concern for a state that experiences such a long, hard winter.
Working closely with Boschung America, SRF prepared the specifications and engineering estimate for the project, as well as assisted with the integration of all system components.

“The Boschung IT-Sens Pavement Sensors were easily integrated with a low cost data logger,” said Scott Peterson, PE, an engineering from SRF Consulting Group. “This compatibility helped keep the cost of the project down.”

In order to keep the district maintenance staff informed of the system operation and to monitor any potential ice hazard in the area, the system also alerts the district and allows visual verification via any online computer or smartphone. Based on information received, the district has the ability to dispatch plow trucks and spreaders to quickly mitigate the ice hazard.

The Blow Ice Warning System was installed in the fall of 2014 and was its performance and effectiveness was evaluated over the following winter season.


RESOURCES

IT-Sens Information
http://boschungamerica.com/products/pavement-sensors/it-sens

MNDOT Blow Ice Warning System