

Research Need Statement 567

I. Need Statement Champions and Information

I.A. Need Statement Champion Information

I.A.1. First and Last Name of Research Champion: **Garrett Schreiner**

I.A.2. Research Champion's Office: **MnDOT RTMC**

I.A.3. Research Champion's Phone Number: **651-234-7022**

I.A.4. Research Champion's Email: **garrett.schreiner@state.mn.us**

I.B. Research Co-Champion

I.A.1. First and Last Name of Research Co-Champion: **Brian Kary**

I.A.2. Research Co-Champion's Office: **MnDOT RTMC**

I.A.3. Research Co-Champion's Phone Number: **651-234-7020**

I.A.4. Research Co-Champion's Email: **brian.kary@state.mn.us**

I.C. Research Needs Title (115 Characters): **Evaluation of Road Weather Messages on DMS Based on Roadside Pavement Sensors**

I.D. Project Sponsor: MnDOT Research Program

II. Research Need Background and Description

II.A. Research Need Background

II.A.1. Describe the problem or opportunity. Nearly 300 DMS are deployed across the state and are used for displaying real-time information to warn motorists of incidents, roadwork or congestion downstream. When it comes to weather related messages, MnDOT has limited DMS usage to blizzard warnings or unexpected/isolated conditions that make catch a motorist by surprise. Although winter related messages have been used, it has never been evaluated to determine if these messages are effective in changing driver behavior.

II.A.2. If applicable, describe how this project will build on previous research. A current research project is working to integrate National Weather Service Warnings into MnDOT's IRIS software which is used to deploy messages on DMS throughout the state. That project will help MnDOT staff deploy blizzard warnings more efficiently than we currently can do manually. [Road Weather Messaging on Dynamic Message Signs (DMS) [2018-020](#)]

II.A.3. If applicable, include the title/s of previous research.

Impact of Dynamic Message Signs on Speeds Observed on a Rural Interstate, Journal of Transportation Engineering, vol. 140, no. 6 (June 2014)

Analysis of Dynamic Advisory Messaging – Phase II, Iowa DOT and Iowa State University CTRE (2018)
Full text via <https://intrans.iastate.edu/research/completed/analysis-of-dynamic-advisory-messaging-phase-ii/>

II.A.4. What is the **objective** of the proposed research?

Separate from the blizzard warning project, the RTMC is looking at deploying a system on Hwy 12 that would display weather related messages on DMS for unexpected/isolated conditions based on roadside pavement sensors. This research project would evaluate the effectiveness of the system being deployed on Hwy 12 in changing driving behavior by measuring any reduction in speed or increase in following distance of vehicles after viewing the message. This project should utilize in-place and temporary traffic detectors to measure changes in driver behavior in order to get immediate results showing the benefits of the system rather than looking at before/after crash data.

This project should NOT be an analysis of crash data, which requires at least 3-years of after data since variability in the number and intensity of snow events over various winters during the study period could skew results.

III. Strategic Priorities, Benefits, and Expected Outcomes

Section III. is for MnDOT sponsored and co-sponsored projects only; all LRRB projects proceed to section IV.

III.A. MnDOT Strategic Priorities

Instructions: Briefly describe how the project aligns with the following MnDOT Research Strategic Priorities. Complete all that apply.

III.A.1. Innovation & Future Needs:

III.A.2. Advancing Equity:

III.A.3. Asset Management:

III.A.4. Safety: **Providing real-time information to road users on road conditions will allow road users to make better decisions and adapt to changing road conditions with fewer surprises.**

III.A.5 Climate Change & Environment:

III.B. Expected Outcomes

Instructions: Check all expected direct outcomes of this research.

- New or improved technical standard, plan, or specification
- New or improved manual, handbook, guidelines, or training
- New or improved policy, rules, or regulations
- New or improved business practices, procedure, or process
- New or improved tool or equipment
- New or improved decision support tool, simulation, or model/algorithm (software)
- Evaluation of a new commercial product
- New or improved technical standard, plan, or specification
- Other. Please specify below:

III.C. Expected Benefits

Instructions: Select all expected benefits that may be realized if the findings and recommendations from this research is adopted or implemented

III.C.1. Construction Savings Choose an item.

III.C.2. Decrease Engineering/Administrative Costs Choose an item.

III.C.3. Environmental Aspects Choose an item.

III.C.4. MnDOT Policy Choose an item.

III.C.5. Lifecycle Choose an item.

III.C.6. Operations and Maintenance Savings Choose an item.

III.C.7. Reduce Risk Other reduced risk. Please describe below

Reduce crashes by better informing road users of potentially hazardous road conditions or changing road conditions

III.C.8. Reduce Road User Cost Other reduced road user cost. Please describe below.

Reduce damage to vehicles and potential for injury or loss of life by reducing crashes

III.C.9. Safety Reduction of crash frequency

Reduce both frequency and severity of crashes caused by drivers failing to adapt to due to changing road conditions

III.C.10. Technology New method of using technology

III.C.11. Other, please describe below:

IV. Technical Advisory Panel

Instructions: Please list the name and affiliation of individuals to consider for the Technical Advisory Panel.

Garrett Schreiner – MnDOT RTMC

Brian Kary – MnDOT RTMC

Joe Huneke – MnDOT CO Maintenance

Jon Bjorkquist – MnDOT CO Maintenance RWIS Coordinator

Jay Swanson – MnDOT Metro Maintenance Snow and Ice Coordinator

Chris Wenzel – MNDOT Metro Maintenance Plymouth Shop Supervisor

Lars Impola – MnDOT Metro Traffic

State Patrol Representative

Hennepin County Sheriff Representative

District 3 Representative

Your assigned Project Advisor is available to answer questions and provide guidance (assigned by the Office of Research & Innovation).

Your Project Advisor is: **Beth Klemann (651)366-3771 beth.klemann@state.mn.us**