

DRISI

CALTRANS DIVISION OF RESEARCH,
INNOVATION AND SYSTEM INFORMATION

TRANSFORMING IDEAS INTO SOLUTIONS

Research

Notes

Rural

MAY 2023

Project Title:
Road Weather Information System
(RWIS) Research

Task Number: 3241

Start Date: January 1, 2019

Completion Date: December 31,
2024

Task Manager:
Melissa L. Clark
Transportation Engineer (Electrical)
melissa.clark@dot.ca.gov

Aurora Program - Pooled Fund Study - TPF-5(435)

Aurora Road Weather Information System (RWIS) Pooled Fund Study (PFS)

WHAT IS THE NEED?

California Department of Transportation (Caltrans) has over 100 Road Weather Information System (RWIS) installations statewide that are deployed for many purposes, such as automated fog, ice, and wind warnings; for traveler info online (on QuickMap); and for planning winter maintenance and other roadwork. The Aurora Program is a technical focused Pooled Fund Study (PFS) working on RWIS issues.

WHAT ARE WE DOING?

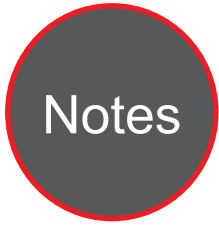
The Aurora Program is a consortium of public agencies focused on collaborative research, evaluation, and deployment of advanced RWIS that fully integrate state-of-the-art roadway and weather forecasting technologies with coordinated, multi-agency weather monitoring infrastructures. Aurora's research projects are designed to improve the efficiency of highway maintenance operations and distribute effective real-time information to travelers. Its initiatives are expected to result in technological advancement and improvement of the existing RWIS, significantly reducing the adverse impacts of inclement weather on mobility. Caltrans Division of Traffic Operations and the Rural Program Steering Committee are supporting this effort.

Pooled Fund Information

- Iowa Department of Transportation (DOT) – Lead State for PFS
- 19 Participant State DOTs
- Full Members: Alaska DOT&PF, Arizona DOT, California DOT, Colorado DOT, Delaware DOT, Illinois DOT, Iowa DOT, Kansas DOT, Maine DOT, Michigan DOT, Minnesota DOT, Missouri DOT, New York State DOT, North Dakota DOT, Ohio DOT, Pennsylvania DOT, Utah DOT, Virginia DOT, Washington State DOT, Wisconsin DOT.



DRISI provides solutions and
knowledge that improves
California's transportation system



- Associate Members: FHWA, Goteborg University, InTrans at Iowa State University, MIT, Meteorological Service of Canada, National Center of Atmospheric Research, Ohio University, Penn State, Purdue University, Swedish Meteorological and Hydrological Institute, University of Minnesota-Duluth, University of North Dakota, University of Utah, University of Waterloo, University of Wisconsin-Madison & Milwaukee, and WTI at Montana State University.
- Caltrans Commitment \$75,000 over 5 years
 - FY 2018/2019 \$25,000
 - FY 2019/2020 \$25,000
 - FY 2020/2021 \$25,000
 - FY 2022/2023 \$25,000
 - FY 2023/2024 \$25,000

WHAT IS OUR GOAL?

The program's mission is to support cooperative research, evaluation, and deployment of innovative technologies that advance road weather monitoring and forecasting in highway design, construction, maintenance, and operations and to serve as an international advocate for expanded uses of these technologies.

Six primary goals are:

1. Improve dissemination of road weather information to transportation providers and end users, ultimately increasing safety by reducing potential weather-related incidents and improving transportation safety, reliability, and mobility in both urban and rural areas.
2. Improve the efficiency of maintenance operations.
3. Aid in the development of technologies that seamlessly integrate to facilitate the formation of partnerships between maintenance and operations and facilitate the dissemination of road weather information.
4. Develop initiatives that assist public agencies in deploying RWIS technologies and methodologies.
5. Encourage greater cooperation and

- information exchange between transportation agencies and the other agencies and groups.
6. Support development of expanded uses of RWIS technologies.

WHAT IS THE BENEFIT?

1. Caltrans involvement allows input on national standards, development, and implementation (device and communication).
2. Caltrans will learn best-practices from other states.
3. Caltrans will be able to influence which studies are conducted, making California's priorities known.

WHAT IS THE PROGRESS TO DATE?

Recently Completed Research:

1. Automated Extraction of Weather Variables from Imagery
<https://aurora-program.org/research/completed/automated-extraction-of-weather-variables-from-imagery/>
2. Roadway Friction Modeling
<https://aurora-program.org/research/completed/roadway-friction-modeling-improving-the-use-of-friction-measurements-in-state-dots/>
3. Non-Invasive Sensor Deployment in Aurora Member States
<https://aurora-program.org/research/completed/non-invasive-sensor-deployment-in-aurora-member-states/>

Research in Progress:

1. Roadway Ice/Snow Detection Using a Novel Infrared Thermography Technology
<https://aurora-program.org/research/in-progress/roadway-ice-snow-detection-using-a-novel-infrared-thermography-technology/>
2. Integration of Connected Vehicle and RWIS Technologies
<https://aurora-program.org/research/in-progress/integration-of-connected-vehicle-and-rwis-technologies/>

The contents of this document reflect the views of the authors, who are responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the California Department of Transportation, the State of California, or the Federal Highway Administration. This document does not constitute a standard, specification, or regulation. No part of this publication should be construed as an endorsement for a commercial product, manufacturer, contractor, or consultant. Any trade names or photos of commercial products appearing in this document are for clarity only.

3. Evaluation of Spring Load Restriction (SLR) Removal Protocols
<https://aurora-program.org/research/in-progress/evaluation-of-spring-load-restriction-removal-protocols/>
4. Optimal RWIS Sensor Density and Location – Phase 4
<https://aurora-program.org/research/in-progress/optimal-rwis-sensor-density-and-location-phase-4/>
5. Automating Variable Speed Limits Using Weather, Traffic, and Friction Data
<https://aurora-program.org/research/in-progress/automating-variable-speed-limits-using-weather-traffic-and-friction-data/>

New research project ideas are being solicited for selection in 2023.

PROJECT WEBSITES

- <https://www.pooledfund.org/Details/Study/658>
- <http://www.aurora-program.org/>

IMAGES



Image 1: AURORA Logo



Image 2: Aurora Website – RWIS Life Cycle Cost Analysis



Image 3: Aurora Website – Non-Invasive Sensor Deployment in Aurora Member States