

AURORA POOLED FUND PROJECT IDEA SOLICITATION 2022

The Aurora Program (<https://aurora-program.org/>) is a partnership of highway agencies (currently, 18 State Departments of Transportation) that collaborate on research, development, deployment, and advocacy of road weather information systems (RWIS) to improve the efficiency, safety, and reliability of highway transportation.

Aurora is currently soliciting project ideas for the 2022 project funding cycle. Project ideas may be submitted for either broad topic areas or specific areas of interest for this funding cycle, which are both listed below.

Broad Topic Areas

- Information dissemination technologies
- Decision support systems
- Weather modeling and analysis
- Equipment evaluations
- Standards and architecture
- Road condition monitoring and performance measures

Topic Area for 2022 Funding Cycle

- Use of virtual RWIS, including state of practice and experiences
- Transition from RPU's to data loggers
- Weather messaging, road conditions and RWIS data for public consumption -- noteworthy practices and public reception/ perception
- Forecasting impacts of weather on motorists
- Forecasting impacts of weather on CAV and electric vehicles
- Turning weather forecasts into action
- Automating variable speed limits (VSL) based on weather data
- Establishing a business case for RWIS
- Engaging transportation and freight companies regarding weather-related impacts of on anticipated shipping
- Analyzing non-winter weather events, e.g. heavy rains and dust storms
- Identifying and analyzing trigger points for road shutdowns
- Establishing a baseline of possible transportation system failure points
- Transferring information and institutional knowledge due to staff turnover
- Identifying techniques to maintain more RWIS site uptime, including identifying failure points and best practices for both routine and storm conditions
- Identifying approaches to obtain more specific information from providers

Additionally, Aurora is requesting proposals for a white paper addressing “Integration of Connected Vehicle and RWIS Technologies”. Details are provided on page 3.

Project ideas related to the aforementioned topics may be submitted on either the “General Aurora Project Idea Description” or “Detailed Aurora Project Idea Description” forms.

- The “General Aurora Project Idea Description” form (page 4) should be used for ideas that are somewhat broad and are not yet fully developed.
- The “Detailed Aurora Project Idea Description” form (page 5) is similar to a pre-proposal and should only be used for well thought out ideas previously discussed with an Aurora Board member. This form may also be used for the “Integration of Connected Vehicle and RWIS Technologies” white paper.

Aurora projects vary in funding level and duration, typically ranging from \$35,000 to over \$100,000 and are between one and two years in length. Aurora does not fund development of propriety processes or products.

Please use the attached form(s) and submit ideas to Zachary Hans (zhans@iastate.edu) by **Monday, April 25, 2022**. Project ideas will be reviewed, voted on and ranked during the Spring Aurora Board meeting during May 2022. Aurora will then either work directly with authors of highly ranked project ideas or synthesize ideas into formal requests for proposals (RFPs).

White Paper: Integration of Connected Vehicle and RWIS Technologies

Road Weather Information Systems (RWIS) are relied on across the US to help predict and manage the impacts of weather on transportation safety and mobility. RWIS data are used heavily by road authorities as well as across the public and private spectrum of weather service providers. The integration of mobile observational data is expanding from agency snowplows to supervisor vehicles equipped with sensors. In addition, Connected Vehicle (CV) and probe-based data are providing agencies with new options for vehicle centric operational and weather-related data.

The Aurora pooled fund is interested in funding white paper discussions that consider how these emerging data sources can work in-sync with traditional RWIS, focusing on the following areas.

- Potential applications and practical feasibility of vehicle to everything (V2X) technology for road weather management, most specifically the integration of RWIS into V2X processes.
- Potential applications and opportunities where both CV and RWIS data can be integrated to prepare for and manage the impacts of hazardous weather on motorist's safety and mobility.
- Benefit of communication both to and from a vehicle and not solely the value of using a vehicle as a mobile sensor.
- Distinction between direct use of mobile sensor information for decision making, edge analysis and use of data measured by mobile and stationary sensors as complimentary datasets within a virtual RWIS environment.
- How RWIS stations (which have power and communications) can support the collection and timely communications of these enhanced data sources and, to this point, if any modifications to RWIS equipment should be considered in the future.
- Similar research and work being conducted.
- Practical considerations of CV system applications and integration with RWIS.
- Conceptual needs and requirements to integrate CV and RWIS data in contrast to other less technical or less expensive options.
- Feasibility of an open source software solution for the integration of CV data with current weather systems and maintenance of new data.
- Pilot proposal(s) for consideration in a second phase.

Interested parties are asked to use the "Detailed Aurora Project Idea Description" form to prepare a brief proposal that: 1) expands on the aforementioned concepts, 2) considers various approaches, 3) outlines your ideas and ability to address the topic, and 4) includes an estimated cost for a 12-month duration project.

GENERAL AURORA PROJECT IDEA DESCRIPTION 2022

Proposed Idea / Problem Statement Title

Proposal Contact: *Author*

Date: *Date the proposed project idea description was submitted.*

Project Area: *Identify the topic that your project idea best fits:*

- *Decision Support Systems*
- *Weather Modeling and Analysis*
- *Standards and Architecture*
- *Equipment Evaluation*
- *Information Dissemination Technologies*
- *Road Condition Monitoring*
- *Other*

Background /

Problem Statement: *Describe the issue(s) that lead to the identification of this research topic and importance/urgency of the topic, as well as a short and concise statement of the specific problem to be addressed.*

Research Objective: *Briefly describe the specific project objective.*

DETAILED AURORA PROJECT IDEA DESCRIPTION 2022

Proposed Idea / Problem Statement Title

Proposal Contact: *Author of proposed idea.*

Date: *Date the proposed project idea description was submitted.*

Project Champion: *If known, Aurora agency or individual that will champion the development and conduct of the project.*

Project Area: *Identify the topic that your project idea best fits:*

- *Decision Support Systems*
- *Weather Modeling and Analysis*
- *Standards and Architecture*
- *Equipment Evaluation*
- *Information Dissemination Technologies*
- *Road Condition Monitoring*
- *Other – to be defined later*

Background /

Problem Statement: *Describe the issue(s) that lead to the identification of this research topic and importance/urgency of the topic, as well as a short and concise statement of the specific problem to be addressed.*

Research Objective: *Briefly describe the specific project objective.*

Research Approach: *Describe the approach you recommend for conducting the research. If possible, identify specific tasks.*

Deliverables/

Products: *Describe the anticipated products of the research and how they would be used.*

Participants: *Identify the public and private organization that may be involved in the conduct of the research.*

Duration: *Estimate the length of the proposed research project.*

Total Project Cost: *Best estimate of what the project will cost.*

Requested Funding: *Aurora funding is limited and, therefore, the identification of other sources of funding is encouraged.*