

# **Aurora Program - Ongoing Project Status**

March 29, 2013

## **FY 2007 through FY2009**

- 2007-05: Multiple-Use ITS Data Collection Sites (\$15,000) = 25% complete
- 2008-01: National Road Weather Testing Program (\$5,000) = 40% complete
- 2009-01: Summary and Comparison of Sensors (\$55,000) = 85% complete
- 2009-05: Further Development of PPAES (\$83,000) = 95% complete

## **FY 2010**

- 2010-02: Mobile-Weather Data Collection Guidelines (\$25,000) = 25% complete
- 2010-03: Results Based Winter Road Maintenance Standards (\$155,000) = 80% complete
- 2010-04: RWIS Sensor Density and Location (\$100,000) = 35% complete
- 2010-05: Determining RPU and Sensor Failure (\$5,000) = 15% complete

## **FY 2011**

- 2011-02: RWIS Training Tool (\$200,000) = 10% complete
- 2011-03: Instruction for Migrating to Open RWIS (\$5,000) = 80% complete
- 2011-04: Study of MDSS Costs (\$20,000) = 40% complete
- 2011-05: Funding Sources Identification (\$5,000) = 10% complete

## **FY 2012**

- 2012-01: Validate the Accuracy of Pavement Condition Predictions (\$100,000) = 5% complete
- 2012-02: Winter Weather Severity Index, Phase 2 (\$5,000) = 45% complete
- 2012-03: Cameras and Operational Impact of Remote ... Condition (\$20,000) = 10% complete
- 2012-04: Communicating and Publicizing Information (\$30,000) = 5% complete
- 2012-05: Seasonal Weight Restrictions Demonstration (\$250,000) = 5% complete

## **FY 2013**

- 2013-01: 2013 Peer Exchange (\$35,000) = 15% complete
- 2013-02: Transition of Clarus to MADIS (\$5,000) = <5% complete
- 2013-03: Improving Estimation ... for Performance Measurement (\$130,000) = <5% complete
- 2013-04: Quantifying Salt Concentration on Pavement (\$150,000) = 10% complete
- 2013-05: Knowledge Base Content Management and Marketing (\$10,000) = <5% complete
- 2013-06: Make the Aurora Winter Severity Index Available to All = 5% complete

## **Project Status Report**

March 29, 2013

**Project:** 2007-05: Multiple-Use ITS Data Collection Practices

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**Champion:** Jack Stickel, Alaska Department of Transportation and Public Facilities

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**Objective:** The ultimate objective of this project is to use RWIS-equipped sites for different types of data collection, such as air-quality and traffic; and to use existing traffic and ITS infrastructure as a platform for RWIS equipment. The addition of multiple intelligent transportation system (ITS) applications at established RWIS sites has the potential to maximize available funding, reduce maintenance and operational risks, and produce more robust data sets per segment.

**Status:**

- The effort being conducted by Iowa State University will support the overall objective of this project by documenting existing practices where they have bundled data collection sensors at RWIS collection sites.
- To date, InTrans has helped develop the questionnaire and scope for the project, as well as found some potential case study locations for the state-of-the-practice review.
- A final detailed scope to accomplish the first goal was approved by the board at their October 2012 meeting. The InTrans scope was accepted and is now under contract.
- A project team conference call was held on March 19, 2013.
- A project mini-meeting will be held on April 2, 2013.
- Results could be documented as part of the Knowledge Base.

**Approximate % Complete:** 25 %

**Barriers/Issues:** None

**Recommendations:**  continue as planned  
 continue with modifications  
 discontinue

**Additional Comments:**

- This project was funded for \$35,000 in FY 2007. This amount was reduced to \$15,000 at the September 2010 board meeting.
- Project Team: Jack Stickel (champion), Tina Greenfield, Joe Doherty, Curt Pape, Dawn Gustafson

## **Project Status Report**

March 27, 2013

**Project:** 2008-01: Development of a National Road Weather Testing Program

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**Champion:** Tina Greenfield, Iowa Department of Transportation

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**Background:** This project was first mentioned at the peer exchange in 2007. Attendees noted that it was hard to find information on completed or ongoing road maintenance research or find appropriate facilities to do testing. After hearing support for a national facility from Clear Roads members, Tina Greenfield helped arrange a conference call between members from Clear Roads, AASHTO, SICOP, PNS, and Aurora to discuss possible cooperation and coordination on our “national facility” projects. This group decided cooperation was beneficial and began working on a draft document describing a national test facility. Soon after, the idea of a single facility morphed into the idea of an information source which can help requestors of research find appropriate facilities and information. A separate “Winter Wiki” project has met the need for finding road maintenance research, but this project must support easy finding of appropriate facilities.

**Objective:** The purpose of this effort is to provide the winter maintenance community with an easy-to-use list of testing facilities that may be of assistance for winter maintenance-related research projects.

**Status:**

- The idea of a single facility has morphed into the idea of a consortium or board of experts which can help requestors of research find appropriate facilities.
- WTI has supplied materials for review that may be used/posted on the Knowledge Base site.
- A new scope was developed and approved by the board in October 2012. Project tasks are:
  1. Start a Maintenance Facilities topic on the Knowledge Base (due Nov. 2, 2012)
  2. Populate the Knowledge Base page with facilities known by the board (due Nov. 30, 2012)
  3. Link to the WTI report on highway testing facilities, many of which may also function as winter facilities (due Nov. 30, 2012)

**Approximate % Complete:** 40 %

**Barriers/Issues:** None

**Recommendations:**  X  continue as planned  
    continue with modifications  
    discontinue

**Additional Comments:**

- Project funding was reduced to \$5,000 by the board in October 2012.
- Project Team: Tina Greenfield (champion), Jack Stickel, Max Perchanok, Lee Smithson

## **Project Status Report**

March 27, 2013

**Project:** 2009-01: Summary and Comparison of Agency Experience with Sensors

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**Champion:** Dawn Gustafson, Michigan Department of Transportation

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**Background:** This project was originally established to summarize and compare the Lufft R2S. Before this project began, several states had obtained and installed sensors. Ultimately, the team decided to proceed with this project as a summary of what sensors Aurora members have installed and their experiences with them. Clear Roads has a working document similar to this.

**Objective:** The objective of this project is to develop a matrix that will summarize different agencies' experiences with sensors used in road weather information data collection.

**Status:**

- A comparison matrix was developed and sent to the team for review and revised.
- The matrix was modified from comments received. A tab was added to the bottom of the spreadsheet for sensor types.
- The team will need to create a list of sensors/vendors that will be included in the initial deployment. The spreadsheet was sent to all Aurora members for their input.
- A final detailed scope was developed and approved by the board in October 2012. Tasks are:
  1. InTrans to resend matrix to Aurora members with note added: survey results will only be used as an internal document for Aurora members. Please complete and return by December 30, 2012. (start 10-10-2012 / end 1-30-2013)
  2. InTrans will compile the responses from Aurora members and distribute the results before the spring 2013 meeting. (start 2-10-2013 / end 4-30-2013)
- Comments on the matrix were received from Utah and Iowa.

**Approximate % Complete:** 85 %

**Recommendations:**  continue as planned  
 continue with modifications  
 discontinue

**Additional Comments:**

- This project was funded for \$55,000 in FY 2009
- Project Team: Dawn Gustafson (champion), Curt Pape, Jack Stickel, Joe Doherty

## **Project Status Report**

March 27, 2013

**Project:** 2009-05: Further Development of Pavement Precipitation Accumulation Estimation System

**Champion:** Mike Adams, Wisconsin Department of Transportation

**Objective:** The two primary objectives of this project are the utilization of RWIS data within PPAES and the blending of PPAES products produced using different observation platforms.

**Status:**

- Efforts were directed at re-derivation of the set of EM propagation equations to be used to determine radar data heights relative to terrain. This progressed a little slower than hoped, because the discovery of an oversight in equations presented by previous researchers resulted in a much larger-scale effort as that oversight applied to essentially every equation in the set of propagation equations.
- We have also been working on re-coding the propagation algorithms to incorporate the changes noted above.
- In addition, work to incorporate the Rapid Refresh Radar has progressed, albeit more slowly than planned this quarter.
- UND had requested and been granted a no-cost extension to January 31, 2013.
- The final report is now under review by the project team.

**Approximate % Complete:** 95 %

**Barriers/Issues:** Both of the Joint PIs were behind in their expected progress due to a variety of factors.

**Recommendations:**  continue as planned  
 continue with modifications  
 discontinue

**Additional Comments:**

- This project was funded for \$83,000 in FY 2009
- Project Team: Mike Adams (champion), Jack Stickel, Jason Norville, Tina Greenfield

## **Project Status Report**

March 28, 2013

**Project:** 2010-02: Mobile-Weather Data Collection Guidelines

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**Champion:** Curt Pape, Minnesota Department of Transportation

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**Status:**

- A mini-meeting was held in Toronto.
- After a lengthy discussion in Toronto, the board agreed to let Curt Pape write a short position paper explaining Aurora's position on mobile sensing of weather parameters.
- Following up to see what happens in Michigan in the winter of 2012-2013 would also be a good idea.
- A mini-meeting has been scheduled for April 2, 2013.

**Approximate % Complete:** 25 %

**Barriers/Issues:** None

**Recommendations:**  continue as planned  
 continue with modifications  
 discontinue

**Additional Comments:**

- This project was funded for \$25,000 in FY 2010
- Project Team: Curt Pape (champion), Max Perchanok, Mike Adams, Tina Greenfield, Joe Doherty, Gabe Guevera, Li Fu, Sheldon Drobot

## Project Status Report

March 28, 2013

**Project:** 2010-03: Results Based Winter Road Maintenance Standards

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**Champion:** Max Perchanok, Ontario Ministry of Transportation

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### **Status:**

- Overall, excellent progress on this project.
- Models that predict the safety and mobility benefits of winter maintenance as a function of road surface index and weather factors have been completed and presented at PIARC and TRB. They reliably predict the increment in safety and mobility due to winter weather, winter maintenance, and traffic level; but have limited power to predict the absolute number of accidents on a generic highway. Work is beginning to investigate the additional role of highway geometry and construction characteristics in improving predictive capability.
- A database and GIS have been prepared to analyze system-wide impacts to changes in winter maintenance performance standards, including bare pavement regain time and surface conditions.
- Cost Model - *This work has fallen behind schedule* and is at a planning stage; it is in the work plan of 2 PhD students and with results expected in early 2014. The purpose is to predict the change in cost of providing winter maintenance, with a change in standards or level of service. The model will incorporate weather severity, road class or traffic level, service standards and maintenance practices, and may include the development of an input-output approach to predict the road conditions resulting from a set of practices applied to a road-weather scenario.
- Benchmarking of Performance Measures - Some additional data were collected last winter to compare performance measures based on visual observations (road condition reports), Vaisala Spectro measurements and digitally-interpreted video. Additional data collection was planned this winter in conjunction with 2010-04 but the methodology did not suite this project and completion was deferred. An analysis of traffic speed as a performance measure was conducted with Iowa data and was reported at TRB 2013 Annual Meeting.
- A mini-meeting has been scheduled for April 2, 2013.

**Approximate % Complete:** 80 %

**Barriers / Issues:** The partnership agreement for this project ends on September 20, 2013. Since some work is behind schedule an extension or addendum is needed.

**Recommendations:**  continue as planned  
 continue with modifications  
 discontinue

### **Additional Comments:**

- Project Team: Max Perchanok (Champion), Dawn Gustafson, Joe Doherty, Sheldon Drobot, Neal Hawkins, Chris Albrecht
- MTO funding schedule ends March 31 2012.
- Aurora funding continues to fall 2013.

## **Project Status Report**

March 28, 2013

**Project:** 2010-04: RWIS Sensor Density and Location

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**Champion:** Max Perchanok, Ontario Ministry of Transportation

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### **Status:**

- A 2 year contract was signed on September 28, 2012
- Work completed:
  - Literature review
  - Web-based survey on practices used to site RWIS stations.
  - Preliminary model development, data collection, exploratory analysis and a case study for Ontario
  - The current model uses a case study approach rather than theoretical, to identify and rank weather and traffic factors influencing winter conditions, and uses them to estimate the importance of situating an RWIS in alternate locations.
  - Collection of field data on route-wise variation in snow and ice conditions in Ontario is being coordinated with 2010-03 and funded by other MTO work, Approximately 20 data sets of road surface friction and video have been obtained.
- Next steps
  - Obtain RWIS and traffic data from other highway agencies to add case studies.
  - Investigate factor weightings in the model
  - Develop framework for optimum RWIS siting
  - Generalize the model based on a variety of case studies from different areas.
  - Develop a benefits model to predict how benefits from RWIS vary with spacing under different geographic conditions.
- An email was sent to the team by Chris Albrecht on March 6, 2013.
- A mini-meeting has been scheduled for April 2, 2013.

**Approximate % Complete:** 35 %

**Barriers/Issues:** Need to follow up discussions with Ohio and other Aurora members to obtain additional RWIS data sets for case studies!

**Recommendations:**  continue as planned  
 continue with modifications  
 discontinue

### **Additional Comments:**

- This project was funded for \$100,000 in FY 2010
- MTO funding of \$55,000 for field data collection is proposed as an MTO in-kind contribution.
- Project Team: Max Perchanok (champion), Jack Stickel, Curt Pape, Dawn Gustafson, Mike Adams, Jason Norville, Tina Greenfield, Sheldon Drobot, Travis Lutman

## **Project Status Report**

March 27, 2013

**Project:** 2010-05: Determining RPU and Sensor Failure

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**Champion:** Jack Stickel, Alaska Department of Transportation and Public Facilities

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**Background:** Determining the life expectancy of ITS devices such as RWIS RPUs and sensors would help anticipate the mean time between failures and help agencies plan for funding, maintenance, procurement, and replacement.

**Status:**

- A two-volume report, NCHRP Report 713, “Estimating Life Expectancies of Highway Assets”, is now available from NCHRP.
- Project 08-71, “Methodology for Estimating Life Expectancies of Highway Assets” is summarized at <http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=2497>.
- The three deliverables from NCHRP are links from the summary page (also posted on the Knowledge Base): guidebook, research documentation and background information, and spreadsheet that illustrates the computations used for estimating life expectancies of particular assets.
- A final detailed scope was developed and approved by the board in October 2012.
- Project tasks are:
  1. Review the NCHRP Report 713 to see how it can apply to the RWIS Sensor and RPU life expectancy question.
  2. Contact Western Transportation Institute on their work involving ITS sensor life expectancies.
  3. Determine how Project 2010-05 can be integrated with Project 2009-01. Project 2009-01 will use a survey. Although both projects are dealing with sensor experience, 2010-05 is asking a different question.
  4. Pending the results of Tasks 1-3, InTrans can perform a literature review (includes the 2-volume NCHRP Report 213), summarize the results of the literature review, and recommend the next steps for further research.
- A mini-meeting has been scheduled for April 2, 2013.

**Approximate % Complete:** 15 %

**Recommendations:**  continue as planned  
 continue with modifications  
 discontinue

**Additional Comments:**

- This project was funded for \$5,000 in FY 2010
- Project Team: Jack Stickel (champion), Tina Greenfield, Jason Norville, Sheldon Drobot

## **Project Status Report**

March 26, 2013

**Project:** 2011-02: RWIS Training Tool

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**Champion:** Tina Greenfield, Iowa Department of Transportation

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**Background:** It is often the case across states and even within states that winter maintenance supervisors or foremen do not have a consistent understanding of RWIS and weather information in real-world decision making. Training may be administered but it is difficult to determine how much is retained, whether understanding was reached, and which parts of the training were successfully integrated into decision making practice. Therefore it is difficult to assess supervisor/foremen competency and it is difficult to tailor training to their needs. This is especially a problem when hiring new staff or hiring contractors because there are few tools to evaluate their ability to perform as required. This project involves the creation of a supervisor evaluation tool which can measure a supervisor's ability to incorporate RWIS and risk management into their decision making process.

**Status:**

- This project is estimated to last 3 years.
- A contract is in place with Iteris.
- A conference call has been scheduled for April 26, 2013.

**Approximate % Complete:** 10 %

**Barriers/Issues:** None

**Recommendations:**  continue as planned  
 continue with modifications  
 discontinue

**Additional Comments:**

- This project was funded for \$200,000 in FY 2011.
- An additional \$65,000 will be allocated from FY 2014.
- Project Team: Tina Greenfield (champion), Max Perchanok, Mike Kisse, Jack Stickel, Mike Adams

## **Project Status Report**

February 28, 2013

**Project:** 2011-03: Instruction for Migrating to Open RWIS

**Champion:** Tina Greenfield, Iowa Department of Transportation

**Background:** The objective of this project is to create a do-it-yourself guide for RWIS sensors, servers, data bases, web displays, etc. This project concept could possibly be added as an extension to the 2009-03 Wiki database project.

**Status:**

- This will be done internally by members contributing to the online knowledge base.
- A new detailed scope was developed and approved by the board in October 2012.
- The Knowledge Base has been populated with data from Iowa and Utah. Others may contribute so we are keeping it open for a bit longer just in case.
- A mini-meeting has been scheduled for April 2, 2013.

**Approximate % Complete:** 80 %

**Barriers/Issues:** None

**Recommendations:**  continue as planned  
 continue with modifications  
 discontinue

**Additional Comments:**

- This project was funded for \$75,000 in FY 2011. This was reduced to \$5,000 at the October 2012 board meeting.
- Project Team: Tina Greenfield (champion), Dawn Gustafson, Jason Norville, Jack Stickel, Mike Kisse, Travis Lutman

## Project Status Report

March 26, 2013

**Project:** 2011-04: Study of MDSS Costs

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**Champion:** Mike Adams, Wisconsin Department of Transportation

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**Background:** This project concept was presented as a concern at the 2009 Peer Exchange and ranked at #9 among those ideas. The objective of this effort is to determine the upfront costs vs. long-term benefits for implementing MDSS systems. Also, determine necessary equipment, how to best equip the trucks, and quantify secondary benefits of equipping the fleet for MDSS. Initially this project will require a survey of the states.

**Status:**

- This project will be conducted internally by Wisconsin DOT and CTRE. No outside contract work will be performed.
- The initial portion of data gathering is being done internally through a survey.
- Mike Adams drafted questions as a starting point for this effort.
- Survey developed July 2012.
- Survey distributed to Aurora Board September 2012.
- Chris Albrecht distributed the survey link to the Aurora board.
- A new scope was developed and approved by the board in October 2012. Project tasks are:
  - Develop survey covering costs of MDSS, AVL-GPS, and manpower costs associated with deploying MDSS. The survey will use Wisconsin DOT's survey engine.
  - Distribute survey first to Aurora Program members, then to a wider audience using the Snow-Ice listserv.
  - Analyze results.
  - Prepare report showing costs for various levels of MDSS deployments.
  - Publish report on the Winter Wiki and publicize results via Snow-Ice listserv.

**Approximate % Complete:** 40 %

**Barriers/Issues:** None

**Recommendations:**  continue as planned  
 continue with modifications  
 discontinue

**Additional Comments:**

- This project was funded for \$20,000 in FY 2011, but funding has been reduced to \$5,000.
- Project Team: Mike Adams (champion), Mike Kisse, Jason Norville, Sheldon Drobot

## Project Status Report

March 26, 2012

**Project:** 2011-05: Funding Sources Identification

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**Champion:** Jack Stickel, Alaska Department of Transportation and Public Facilities

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**Background:** Road weather management programs and Road Weather Information Systems (RWIS) can tap into various federal funding sources. This includes standard funding allocations and grant allocations. These sources are not well known to all agencies.

**Objective:** This project will compile potential funding sources and approaches that state department of transportation agencies can tap to fund the road weather management program. This would include funding partnerships, grants, standard allocations, and shared cost opportunities.

**Status:**

- This project will involve surveying the Aurora member agencies on the funding sources they use, how to tap into them, and the processes they use to secure the funding
- The resulting document would describe the funding sources, the approaches agencies used to tap into funding, and the process they used to secure funding.
- This may be done internally by board members or through ISU.
- The new surface transportation program authorization “Moving Ahead for Progress in the 21<sup>st</sup> Century Act (MAP-21) was signed in July 2012. The funding authorization is for federal fiscal year (FFY) 2013-2014. There have been several webinars covering funding eligibility since the authorization bill was signed, including ITS America:
- A new scope was developed and approved by the board in October 2012. Tasks are:
  - Establish a Funding Source section in the Aurora Knowledge Base.
  - Review MAP-21 and reference the applicable funding avenues for RWIS technologies.
  - Provide links to applicable webinars on MAP-21 that cover ITS, RWIS, traveler information funding.
  - Establish an Aurora website notification process where members can add short term funding opportunities and have this information distributed automatically to Aurora members.

**Approximate % Complete:** 10 %

**Barriers/Issues:** None

**Recommendations:**  continue as planned  
 continue with modifications  
 discontinue

**Additional Comments:**

- This project was funded for \$5,000 in FY 2011.
- Project Team: Jack Stickel (champion), Joe Doherty, Jason Norville, Lee Smithson

## **Project Status Report**

March 28, 2012

**Project:** 2012-01: Validate the Accuracy of Pavement Condition Predictions from Various Sources

**Champion:** Max Perchanok, Ontario Ministry of Transportation

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**Background:** This idea came from the third peer exchange. MDSS of various types have been implemented in approximately 15 highway agencies. They combine RWIS forecasts with rules of practice, real-time plow and salt records, and other information to predict the current and future snow/ice status of the pavement during storms. Successful operations require that predictions are accurate. Few if any studies have been completed to validate the accuracy of the pavement condition predictions and provide confidence in MDSS recommendations. There is a need to close the loop on the "open loop" status of pavement forecasting. MDSS failure can occur for several reasons. First, the forecast could be incorrect. Second, the treatment recommendations could be incorrect. Third, the field forces involved in applying the treatment recommendations may not be applying the recommended treatment. Understanding which is important to correcting the problem.

**Objective:** This project would validate the accuracy of the pavement condition predictions and provide confidence in the MDSS recommendations.

**Status:**

- A mini-meeting was held in Toronto on October 9, 2012.
- A mini-meeting has been scheduled for April 2, 2013.
- A draft RFP is ready for review by the project team on April 2.

**Approximate % Complete:** 5 %

**Barriers/Issues:** Complex logistics involving multiple MDSS providers and multiple highway agencies.

**Recommendations:**  continue as planned  
 continue with modifications  
 discontinue

**Additional Comments:**

- This project was funded for \$100,000 in FY 2012.
- Project Team: Max Perchanok (champion), Dawn Gustafson, Tim Peters, Curt Pape, Mike Adams, Gabe Guevera

## **Project Status Report**

March 28, 2012

**Project:** 2012-02: Winter Weather Severity Index, Phase 2

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**Champion:** Tina Greenfield, Iowa Department of Transportation

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**Background:** Further work on winter storm or winter season weather indices was suggested at the 2011 Peer Exchange. This need was passed to Aurora. There are already many indices available and several agencies are using them operationally. Through discussion amongst the board it was proposed that perhaps the true problem was the inability to find or understand the indices that were already available.

**Objective:** Summarize the general purpose and function of a winter storm, winter season index and their proper use in understanding winter maintenance performance. Summarize specific existing indices so users can select the index that best fits their agency needs and data availability.

**Status:**

- A final detailed scope was developed and approved by the board in October 2012.
- Project tasks are:
  1. Create a general summary of indices and their use and misuse (due December 1, 2012)
  2. Gather information from published indices and those in use at Aurora agencies. Compile the results in a table with information on index formula, necessary data, agencies that are using it, and purpose (due April 1, 2013)
  3. Prepare a short report of the findings and post on a Winter Wiki page (due July 1, 2013)
- Tina Greenfield has distributed a draft guide to the project team.

**Approximate % Complete:** 45 %

**Barriers/Issues:** None

**Recommendations:**  continue as planned  
 continue with modifications  
 discontinue

**Additional Comments:**

- This project was funded for \$5,000 in FY 2012.
- Project Team: Tina Greenfield (champion), Max Perchanok, Curt Pape, Mike Adams

## **Project Status Report**

March 28, 2013

**Project:** 2012-03: Cameras and Operational Impact of Remote Road Condition

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**Champion:** Travis Lutman, North Dakota Department of Transportation

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**Background:** This idea came out of the September 2011 peer exchange in Montana. Utah DOT and a private contractor have developed a low-cost live PTZ camera system to monitor road conditions at locations not covered by conventional traffic cameras or RWIS sites. The purpose of this is to identify if treatment is needed or not. The outcome is that the local manager can decide whether a truck needs to go out or not. The system has had impacts on how and when dispatch is done. It has also enhanced road condition observation in rural areas for the purposes of traffic management.

**Objective:** This project would identify efficiencies gained, impacts on road condition, costs, cost avoidance, and document the model for other agencies to follow.

**Status:**

- This project is just underway.
- A contract is now in place with BYU, and they have begun work on this effort.

**Approximate % Complete:** 10 %

**Barriers/Issues:** None

**Recommendations:**  X  continue as planned  
    continue with modifications  
    discontinue

**Additional Comments:**

- This project was funded for \$20,000 in FY 2012.
- Project Team: Travis Lutman (champion), Ron Hall, Mike Kisse, Curt Pape, Gene Martin

## **Project Status Report**

March 26, 2013

**Project:** 2012-04: Communicating and Publicizing Road Weather and Operations Information

**Champion:** Joe Doherty, New York State Department of Transportation

**Background:** This idea also came out of the 2011 peer exchange. Road weather systems are designed to meet a broad array of stakeholder needs. Key stakeholders include winter weather maintenance operations, first responders, emergency managers, value-added forecast providers, commercial trucking operations, transit and the traveling public. Information delivery to this stakeholder base may include data feeds, tabular listings, graphical presentations, and weather data integrated with other data sources (real-time traffic data, for example). Having an understanding of the stakeholder's key operational weather thresholds and how stakeholders make decisions based on these thresholds can help transportation agencies tailor a road weather information system program to meet the stakeholder needs.

**Objective:** This research would likely compile the best practices on how road weather information is being transferred to stakeholders. In addition, it is important to identify the best method(s) for notifying the public/media and operations staff of current RWIS data. It is not clear how much information is needed to inform the public and government officials of "current" operations during a storm. Research should look at how new operational processes and sensor output can be quickly adopted.

**Status:**

- This project is just underway.
- A scope should be completed by the end of 2012.
- A discussion has been had with SICOP as well.

**Approximate % Complete:** 5 %

**Barriers/Issues:** None

**Recommendations:**  continue as planned  
 continue with modifications  
 discontinue

**Additional Comments:**

- This project was funded for \$30,000 in FY 2012.
- Project Team: Joe Doherty (champion), Jack Stickel, Jason Norville, Dawn Gustafson, Tim Peters
- Clear Roads is also a partner on this effort.

## **Project Status Report**

March 28, 2012

**Project:** 2012-05: Seasonal Weight Restrictions Demonstration

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**Champion:** Max Perchanok, Ontario Ministry of Transportation

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**Background:** Roads and highways with minimal base and sub-grade structure are susceptible to freeze-thaw deformation during winter and to weakening during spring. Thaw damage is mitigated by imposing load restrictions during the thaw period. Longer than necessary load restrictions impose a hardship on the transportation industry, while restriction periods that are too short lead to increased road maintenance costs. A balance of interests can be achieved by forecasting thaw depth and pavement strength during the thaw period, providing a rational basis for setting and lifting restrictions according to subsurface temperature and moisture profiles that are unique to each winter and location.

**Objective:** The objective of this research is to validate the predicted thaw depths and restriction dates recommended using the *Clarus* EICM approach and alternative, degree-day based approaches to provide an understanding of reliability of different approaches in setting load restriction dates.

**Status:**

- An RFP was completed and is to be posted by Iowa DOT

**Approximate % Complete:** 5 %

**Barriers/Issues:** The RFP calls for two phases; planning and implementation. Based on experience with previous RWIS-related projects, a planning phase is needed for literature review and to see which agencies have the appropriate infrastructure to provide case studies for the project.

**Recommendations:**  continue as planned  
 continue with modifications  
 discontinue

**Additional Comments:**

- This project was funded for \$250,000 in FY 2012.
- Project Team: Max Perchanok (champion), Mike Adams, Jack Stickel, Dawn Gustafson, Travis Lutman, Mike Kisse
- TRB Winter Maintenance Committee submitted a proposal for an NCHRP synthesis on spring load restrictions. If funded it would provide useful input to Phase 1.
- TRB Winter Maintenance Committee will propose a workshop at the 2015 TRB meeting that would support this project.

## **Project Status Report**

March 28, 2013

**Project:** 2013-01: 2013 Peer Exchange

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**Champion:** Jason Norville, Pennsylvania Department of Transportation

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**Background:** Aurora has been actively researching a number of surface transportation weather projects while Clear Roads is researching materials, equipment and practices related to winter maintenance operations. Unfortunately the information/results sometimes does not reach end users in all states or at different agency levels. The winter maintenance community needs to be more aware of the research conducted by Aurora and Clear Roads and other research organizations and take a more active role in requesting research to meet winter operational needs.

**Objective:** The objective of this project is to conduct a national winter maintenance meeting to share research results from the peer exchanges held in 2007, 2009, and 2011, get updates from each snow-belt state, and discuss other issues related to winter snow removal operations. Each state would send a representative to the meeting that is most actively involved with the areas covered by Aurora, Clear Roads, PNS, SICOP and FHWA efforts.

**Status:**

- Just underway.
- Chris Albrecht is making arrangements with a hotel in Vancouver, Washington.
- Dates have been set for the week of September 9-13, 2013.

**Approximate % Complete:** 15 %

**Barriers/Issues:** None

**Recommendations:**  continue as planned  
 continue with modifications  
 discontinue

**Additional Comments:**

- This project was funded for \$35,000 in FY 2013.
- Project Team: Jason Norville (champion), Mike Adams, Dawn Gustafson, Tina Greenfield

## **Project Status Report**

March 26, 2013

**Project:** 2013-02: Transition of Clarus to MADIS

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**Champion:** Jack Stickel, Alaska Department of Transportation and Public Facilities

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**Background:** The Clarus System functionality (observations, quality checks, metadata, and spatial location) is transitioning to the MADIS System. Existing FHWA funding will carry the existing Clarus System into CY 2013/2. Aurora needs to materially participate in the transition to ensure the Clarus functionality is captured in the new MADIS system. There will be four phases in the transition:

- Each transportation agency's RWIS network will be added as a mesonet.
- A metadata interface to add and modify RWIS site information will be added.
- The Clarus quality checks for atmospheric and surface observations will be added.
- Subscription services similar to Clarus will be added.

The initial MADIS Surface Display web site has been established. No specific Aurora funding opportunities to assist in the transition have been identified as of yet. There potentially could be assistance requests or design review meetings.

**Objective:** The objective of this project is to participate in the transition of the Clarus System to the NOAA's ESRL Meteorological Assimilation Data Ingest System (MADIS) system.

**Status:**

- Just underway.
- Research Approach:
  1. Add missing RWIS sites to the new MADIS system.
  2. Update RWIS metadata through Mixon Hill.
  3. Participate in MADIS Surface System web site reviews for a) how well it captures the Clarus System functionality, and b) how efficient the web site operates.

**Approximate % Complete:** <5 %

**Barriers/Issues:** None

**Recommendations:**  continue as planned  
 continue with modifications  
 discontinue

**Additional Comments:**

- This project was funded for \$5,000 in FY 2013.
- Project Team: Jack Stickel (champion), Mike Adams, Ron Hall

## **Project Status Report**

March 29, 2012

**Project:** 2013-03: Improving Estimation of Real-Time Traffic Speeds for Performance Measurement

**Champion:** Tina Greenfield, Iowa Department of Transportation

**Background:** The Iowa DOT is interested in developing a dynamic model capable of predicting in real time acceptable drops in traffic speed at major highway during major weather events with realistic uncertainty measures. The primary usage of such model is to evaluate the performance of highway winter maintenance operations and optimize resource allocation.

**Objective:** The objective of this project is to develop point level performance measurements based on an improved model which can produce real time prediction of traffic speed drops with uncertainty measures. This model will be tested and improved based on traffic, weather, and maintenance activity data from several different states/regions.

**Status:**

- Just underway.

**Approximate % Complete:** <5 %

**Barriers/Issues:** None

**Recommendations:**  X  continue as planned  
    continue with modifications  
    discontinue

**Additional Comments:**

This project was funded for \$130,000 (\$30,000 for task 1, \$35,000 for task 2, \$35,000 for task 3, \$30,000 for task 4) in FY 2013.

- Project Team: Tina Greenfield (champion), Max Perchanok, Jack Stickel, Ron Hall

## **Project Status Report**

March 28, 2012

**Project:** 2013-04: Quantifying Salt Concentration on Pavement

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**Champion:** Max Perchanok, Ontario Ministry of Transportation

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**Background:** Peer exchanges have shown the need for a mobile and/or more accurate surface salinity sensor. An alternative is to develop a better way to predict the salt concentration on the pavement considering the records of application rate, time plowing, precipitation type and rate, surface temperature, traffic, pavement type, wind speed, etc. Road salt management is a key issue for many highway agencies that are required to provide safe roads during winter storms while protecting the natural environment from excessive exposure to its environmental effects. Critical methods to manage salt loadings are by applying the right amount of salt at the right place and the right time, and this requires accurate knowledge of how much salt is already on the road before re-applying during a storm.

**Objective:** To develop a better way to build upon and combine previously attempted approaches to measure or predict representative salt concentration on the pavement to a precision that can be used for tactical planning of salt application rates in advance of and during winter storms. It should consider past applications and timing, plowing, precipitation type and rate, surface temperature, traffic, pavement type, wind speed, etc. The pooled fund MDSS initiative should do a lot of this for its surface condition and treatment predictions, so this effort could just focus on just what MDSS may be lacking.

**Status:**

- A project description has been prepared for discussion by the project team on April 2.
- Budget requested: \$150,000

**Approximate % Complete:** 10 %

**Barriers/Issues:** None

**Recommendations:**  continue as planned  
 continue with modifications  
 discontinue

**Additional Comments:**

- Project Team: Max Perchanok (champion), Tina Greenfield, Jason Norville, Tim Peters, Curt Pape, Annette Dunn, Lee Smithson
- This project was funded for \$150,000 in FY 2013.
- This project was given a high priority at the National Winter Maintenance Peer Exchange.

## **Project Status Report**

March 29, 2012

Project: 2013-05: Knowledge Base Content Management and Marketing

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**Champion:** Tina Greenfield, Iowa Department of Transportation

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**Background:** This idea was suggested by Tina Greenfield as a way to help populate and maintain the knowledge base website with several of the smaller Aurora projects that do not fall under the management contract. Periodically, certain road weather topics arise that seem well suited to be added to the “wiki” site. If the information is easily available it can simply be posted by Aurora members or administration. Sometimes the topic requires a little bit of work before a good product can be posted, such as collecting opinions from a survey, literature reviews, and other minor analysis and arrangement. Other topics may require regular reviews and updates in order for the information to stay pertinent. For example, information on funding sources or calls for papers may change regularly.

**Objective:** To create a mechanism by which topics requiring extra work can be added to the Wiki.

**Status:**

- Just underway.
- This will likely be done by Iowa State University.

**Approximate % Complete:** <5 %

**Barriers/Issues:** None

**Recommendations:**  continue as planned  
 continue with modifications  
 discontinue

**Additional Comments:**

This project was funded for \$10,000 in FY 2013.

- Project Team: Tina Greenfield (champion), Jack Stickel, Jason Norville

## **Project Status Report**

March 29, 2012

Project: 2013-06: Make the Aurora Winter Severity Index Available to All

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**Champion:** Tina Greenfield, Iowa Department of Transportation

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**Background:** This idea also came out of the September 2011 peer exchange in Montana. This effort would involve making the Aurora winter index available to anyone and extend the length of the record from the current period (2002-2008). Another component would be to develop technology transfer sessions at APWA or AASHTO.

**Objective:** This effort would involve making the Aurora winter index available to anyone and extend the length of the record from the current period (from now back to the 2008-2002 period as well).

**Status:**

- Just underway.
- Tina is working on an extension with AccuWeather.

**Approximate % Complete:** 5 %

**Barriers/Issues:** None

**Recommendations:**  continue as planned  
 continue with modifications  
 discontinue

**Additional Comments:**

- Project Team: Tina Greenfield (champion), Mike Adams, Curt Pape, Jack Stickel, Jason Norville
- This project was funded for \$30,000 in FY 2013.



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