

# Aurora Program

minutes

**Aurora Board Meeting  
April 13-15, 2010 – Salt Lake City, Utah**

## **Individuals Participating in the Meeting:**

Tina Greenfield, Iowa DOT  
Dean Kernan, Illinois DOT  
Max Perchanok, Ontario MOT  
Dawn Gustafson, Michigan DOT  
Curt Pape, Minnesota DOT  
Mike Adams, Wisconsin DOT  
Bill Hoffman, Nevada DOT  
Mike Kisse, North Dakota DOT  
Jack Stickel, Alaska DOT&PF  
Jason Norville, Pennsylvania DOT  
Joe Doherty, New York DOT  
Ralph Patterson, Utah DOT  
Lynn Bernhard, Utah DOT  
Paul Pisano, FHWA  
Gabe Guevara, FHWA  
Lee Smithson, SICOP  
Sheldon Drobot, NCAR  
Lee Fu, University of Waterloo  
Jeff Tilley, University of North Dakota  
Neal Hawkins, Iowa State University  
Chris Albrecht, Iowa State University

### **I. Friends of Aurora**

**Introductions** – Bill Hoffman welcomed the attendees to the meeting, noting the guests in attendance representing the private sector Friends of Aurora. He then asked everyone to introduce themselves and provide a little background on their role in the road weather industry. Visitors included Jeff Edelstein with AmeriTrak, Don Brown with Campbell Scientific, Tony Mouser with Northwest Weathernet, John Mewes with Meridian, Jeremy Duensing with Telvent DTN, Mike Corbett with Lufft, Kevin Petty with Vaisala, Eric Gibbons with High Sierra Electronics, Kurt Kinion with Quixote, and Robert Boggs with Pelmorex.

**Presentation on Aurora** – Next, Chris Albrecht and Bill Hoffman gave a brief presentation on Aurora, its mission, and its research. Where applicable, Aurora research project champions commented on the status of several past and present research efforts.

**Vendor Presentations** – The vendors then each had an opportunity to give a 15 minute presentation on their company and its place in the road weather industry.

## II. Friends of Aurora (continued)

After a short break, Chris Albrecht reviewed a list of hot topics that Aurora has been tracking for several years. Topics included mobile platforms, plug-and-play systems, coordination with Clear Roads and other maintenance-focused efforts, and sensor reliability. A lengthy and productive discussion followed the review of issues.

## III. Open and General Items

**Review and Approval of Agenda** – Bill Hoffman began the formal Aurora Board meeting by asking the board members to review the meeting agenda. After a few comments, the agenda was approved as the order of business for the meeting. *A copy of the agenda is attached to these minutes.*

**Review of Previous Minutes** – Chris Albrecht asked the board to review the draft board minutes from the September 2009 board meeting in Des Moines. Noting the short time frame, he agreed to accept any comments via email upon tentative approval of the minutes.

## IV. Project Updates

The project champions then reviewed the status of ongoing research. Chris Albrecht provided the board with a summary of the latest status reports for each project. *A copy of this summary is attached as Attachment A.* Details of the status reports are as follows:

**Project 2000-01 – Benchmarking the Performance of RWIS Forecasts:** Max Perchanok reviewed this effort, noting that administrative problems at MTO continued to significantly delay the project. He also noted that a project mini-meeting was held on the previous morning, wherein the team identified several sources of potential forecast data and discussed three climate zones to be used in the analysis. The three zones are coastal, inland, and mountain. The team also discussed finishing this project by the end of 2010 and using NCAR's Sheldon Drobot to do some data crunching for them.

**Project 2003-04 – Intelligent Image-Based Winter Road Condition Sensor - Phase III:** Chris Albrecht reviewed this effort, noting that he was still waiting on a conclusive summary of this effort from Dan Eriksson.

**Project 2004-04 – Winter Weather Severity Index Enhancements:** Tina Greenfield reviewed this project. She noted that there were no new developments and that the team was waiting on Accuweather to respond to its latest requests. Tina also noted that only about \$23,000 of \$46,000 contract amount had been paid. Max Perchanok was also added to this project team.

**Project 2005-01 – Development of a RWIS Quality Assurance Monitoring System:** Jack Stickel reviewed this effort, noting that he had also held a mini-meeting with the project team. He noted that the meeting resulted in several project milestones. Specifically, he noted, milestones were set as May 15 for a draft concept of operations, then user requirements by early June.

**Project 2005-02 – RWIS Telecommunications Issues and Options:** Dean Kernan reviewed this project, noting that the team recommended the final report for approval by the board. After a short discussion, the board voted to approve the report and close out this project.

**Project 2005-06 – New Road Surface Condition Sensor:** Chris Albrecht noted that he was still waiting on a report from Dan Eriksson.

**Project 2006-01 – Support of the *Clarus* Initiative:** Tina Greenfield noted that there was nothing new to report on this effort.

**Project 2006-08 – Low Cost Mobile RWIS:** Chris Albrecht noted that the team was still waiting on a final report from Claude Lapointe.

**Project 2007-01 – RWIS Equipment Monitoring System – Phase II:** Jack Stickel noted that he had also held a mini-meeting with the project team for this effort along with Project 2005-01. He noted that the same milestones were set for this effort that was closely related. In addition, Dawn Gustafson and Mike Adams were added to the project team.

**Project 2007-02 – Cold Weather Testing of the Halliday Road Grip Unit:** Chris noted that the data for this project was made available on the program website. After a short discussion, it was noted that once comments were received, the edits to the report would be completed by August 31, 2010.

**Project 2007-03 – Incorporation of MDSS into Winter Weather Forecasting - Phase I:** Tina Greenfield reviewed this project, noting that the mini-meeting had resulted in a very good discussion of this problem and how it may be addressed. She also noted that the remaining \$30,000 allotted to this effort could be utilized in a contract with the University of North Dakota. The group also noted that someone in New Jersey had some experience in this area. Chris Albrecht noted that he would help identify and contact this person.

**Project 2007-04 – Development and Demonstration of a Freezing Drizzle Algorithm:** Max Perchanok discussed this project, noting that he planned for this project to be completed by the end of August 2010. He also noted that the project mini-meeting was fruitful and that several members of the team will be in touch with each other following the meeting.

**Project 2007-05 – Multiple-Use ITS Data Collection Sites:** Jack Stickel reviewed this project, noting that the consensus at the recent project mini-meeting was that the effort would involve a synthesis of these integration activities around the United States.

## **V. Project Updates (continued)**

**Project 2008-01 – Development of a National Road Weather Testing Facility:** Tina Greenfield noted that there were no new developments to report, but that the mini-meeting focused on incorporating some of this project's goals into the "wiki" site under Project 2009-03, such as using it as a "blue collar TRIS" for non-academic research. She also noted that there was still a need to inventory testing sites too.

**Project 2008-02 – Evaluation of Utah DOT’s Weather Operations/RWIS Program:** Ralph Patterson noted that the final report for this effort was now ready for review by the entire board.

**Project 2008-03 – Next Generation RWIS for Canada:** Max Perchanok reviewed the project, noting strong support for the project from MTO. He also noted that the overall project plan should be ready in June.

**Project 2009-01 – Evaluation and Inter-comparison of the Lufft R2S Sensor:** Ralph Patterson spoke on this project, noting that he would like to get input from New York and Minnesota concerning their experiences with the sensor. Ultimately, he noted, the plan was to go through an RFP with the Iowa DOT to fulfill this research. He also noted that the team would be meeting soon to discuss changes/updates to the scope.

**Project 2009-03 – Knowledge Base for RWIS Programs and Environmental Data Loggers:** Jack Stickel reviewed the results of the project mini-meeting held the prior morning. He noted that many issues concerning this effort had been discussed; including website structure and elements, long-term support, and the concept of operations. Chris noted that the results of the meeting would be taken back to his staff at ISU for development of the “wiki” site.

**Project 2009-04 – Road Weather Education Enhancements and Dissemination:** Dawn Gustafson spoke this project, noting that there was considerable potential overlap with this effort and the knowledge base site. She also noted that the team would do further canvassing of the peer exchange states for sources of educational materials and gaps.

**Project 2009-05 – Further Development of Pavement Precipitation Accumulation Estimation System (PPAES):** Ralph Patterson noted that the mini-meeting for this effort produced several milestones. Specifically, the project is to end on September 30, 2011, giving the team 18 months from the April 1, 2010 start date. Jeff Tilley noted that the first 9 months will be focused on coding and initial tests, with the second 9 months consisting of validation to produce a much better algorithm. Currently the contract is set not to exceed \$83,000, Chris added. The board agreed that the schedule would be discussed and checked at the next board meeting.

## **VI. Project Updates (continued)**

**Project 2009-06 – Salinity Sensor Improvements and Development:** Tina Greenfield reported on the project, noting that there was a discussion on reducing funding during the mini-meeting. She added that it was ultimately decided that funding would be reduced to \$5,000 until the team is sure there will not be an effort possible under Aurora.

**Project 2010-01 – Enhancements of AI/RWIS CBT:** Tina Greenfield noted that funding was still needed from Clear Roads or AASHTO in order to fulfill this project. After a short discussion, it was decided that Lynn Bernhard would follow up with Clear Roads, and Lee Smithson would follow-up with AASHTO.

**Project 2010-02 – Mobile-Weather Data Collection Guidelines:** After a lengthy discussion, it was decided that the project team for this project would consist of Bill Hoffman as the new champion, Gabe Guevera, Lee Fu, Jeff Tilley, Sheldon Drobot, Max Perchanok, and Curt Pape. It was also noted that this effort was a sister project to project 2010-04. Bill noted that he would work with Chris Albrecht to iron out further details.

**Project 2010-03 – Co-Funding Winter Road Research:** Max Perchanok reviewed this effort briefly, noting that Lee Fu presented at the mini-meeting the day before. Chris Albrecht noted that the total budget was increased to \$154,830 during the mini-meeting.

**Project 2010-04 – RWIS Sensor Density Grid:** No report was provided for this effort, although Chris noted that the project team would consist of Kirk Carpenter as champion, Dawn Gustafson, Mike Kisse, Jack Stickel, Sheldon Drobot, and Max Perchanok.

**Project 2010-05 – Determining RPU and Sensor Failure:** No report was provided for this effort, although Chris noted that the project team would consist of Jack Stickel as champion, Ralph Patterson, Tina Greenfield, and Jason Norville.

## **VII. Program Administration and Financial Status**

Chris Albrecht briefly reviewed membership payments, contributions, and agreements. Noted were Wisconsin's recent payment for FY2010, after being inactive for FY2009, and a recent three year commitment from North Dakota.

## **VIII. Member Agency Updates**

Next, each agency in attendance gave a brief review of their recent winter maintenance and road weather-related activities.

**Pennsylvania Department of Transportation** – Jason Norville noted that PennDOT's statewide RWIS upgrade will be done by the coming winter. He also noted that they are participating in the pooled fund MDSS, applying it to 15 routes at first. Finally, Jason noted that Pennsylvania has the most bridges equipped with FAST systems in North America. A discussion of these systems followed.

**Alaska Department of Transportation and Public Facilities** – Jack Stickel reviewed recent activities in Alaska, noting that they recently discussed a need for ITS corridor plans for two roads going out of Anchorage. They are also interested in speed as an indicator of weather, he added. Finally, Jack noted that RWIS and health of network projects are also a high priority because of budget problems.

**Illinois Department of Transportation** – Dean Kernan noted that Illinois is now hosting a new central server, saving \$100,000 in dial-up costs for the department. They also have a template on how bidding was done, which he offered to share. Dean also noted that IDOT is hiring a winter operations engineer.

**Minnesota Department of Transportation** – Curt Pope reviewed the status of pavement sensors in Minnesota, as well as their successful use of cameras throughout their system. Another issue he noted was the need to prove the value of mobile sensing within the department.

**North Dakota Department of Transportation** – Mike Kisse reported that NDDOT management is now questioning their investment in Aurora and needs a document explaining the benefits of the program. Chris noted that he would send Mike something to this effect as soon as possible.

**Iowa Department of Transportation** – Tina Greenfield discussed and demonstrated the Weatherview site, then discussed speed as measure of weather. A lengthy discussion followed on this topic.

**New York State Department of Transportation** – Joe Doherty noted that NYSDOT is working on a new contract for RWIS services. He also noted that this was the first winter for 511 in New York, as well as mentioning the statewide budget issues.

**Ontario Ministry of Transportation** – Max Perchanok reviewed MTO, noting that they are planning on a system expansion, adding 26 new sites in the coming months. Last summer they added a lot of heated/tipping buckets to RWIS sites, he added. After a short discussion of how contracting works in Ontario, Max noted that they are into their third generation of contracts with AMEC.

**Utah Department of Transportation** – Ralph Patterson reported that there were recent issues on their budget and funding, noting that the bulk of their funding comes from operations. Nonetheless, they are doing a good job with the program, he added.

**Wisconsin Department of Transportation** – Mike Adams reported that Wisconsin DOT is pushing MDSS this year, with statewide expansion by next winter. He also noted that WisDOT is now working more closely with emergency management groups.

**Michigan Department of Transportation** – Dawn Gustafson noted that MDOT has added new sites this past year, then discussed power and connectivity issues at some of the new sites. A lengthy discussion followed, wherein the group shared their own experiences. She also noted that MDOT has established a new maintenance contract for the upper peninsula of Michigan. Finally, she noted that the department is focusing more and more on training for winter maintenance and road weather.

**Nevada Department of Transportation** – Bill Hoffman first reviewed Nevada's statewide RWIS maintenance contract. He also noted that they like the live-view mobile cameras and will be adding them in remote locations around the state. The group also discussed the I-580 project and problems with integrating data that resulted. Bill also noted that the Hoover Dam bypass bridge has a wind warning system.

## **IX. FHWA Mobile Observing Project**

Paul Pisano and Gabe Guevera briefly reviewed the latest developments with the FHWA Road Weather Management Team and the IntelliDrive initiative. A lengthy discussion followed, wherein the group discussed the potential of mobile sensing in detail.

## **X. National Initiatives and Partnerships**

The board agreed to discuss this topic at a later date.

## **XI. 2010-2011 Work Plan**

Chris Albrecht reviewed the process and timeline schedule highlighting the tasks that were planned for the coming months.

## **XII. 2010-2011 Work Plan**

Chris Albrecht continued to lead the discussion of necessary points of action and asked for potential project candidates for the next year. It was agreed that the board would submit ideas to Chris by early summer.

## **XIII. Aurora Communications Plan**

The board agreed to discuss this topic at a later date.

## **XIV. Future Aurora Meetings and Calls**

The board then discussed dates and times of future meetings. As a result, the following were set:

- Administrative call on Thursday, June 10, 2010 (1:00 p.m. CDT)
- Board web meeting on Thursday, June 17, 2010 (1:00 p.m. CDT)
- Administrative call on Thursday, August 5, 2010 (1:00 p.m. CDT)
- Board web meeting on Thursday, August 12, 2010 (1:00 p.m. CDT)
- Administrative call on Thursday, September 16, 2010 (1:00 p.m. CDT)
- Board meeting on Tuesday-Thursday, September 21-23, 2010 in Des Moines,

## **XV. Other Aurora Items**

Nothing further items were discussed.

# **Agenda**

# Aurora Program Board Meeting and FOA Events

April 13-15, 2010

Hotel Monaco, Salt Lake City, Utah, USA

## *AGENDA*

### Tuesday, April 13, 2010:

#### **8:00 Project Mini-Meetings**

- 8:00 A) Project 2009-04 Dawn Gustafson and Team  
Team includes: Adams, Patterson, Perchanok, Tilley
- 8:00 B) Projects 2008-01 and 2009-03 Tina Greenfield, Jack Stickel, and Teams  
Teams include: Pape, Patterson, Perchanok, Smithson, Tilley
- 8:50 A) Project 2000-01 Max Perchanok and Team  
Team includes: Adams, Hoffman, Pape, Tilley
- 8:50 B) Projects 2005-01 and 2007-01 Jack Stickel and Teams  
Teams include: Adams, Doherty, Greenfield, Gustafson, Pape, Patterson

#### **9:45 Break**

#### **10:00 Project Mini-Meetings (continued)**

- 10:00 A) Project 2007-04 Max Perchanok and Team  
Team includes: Adams, Drobot, Pape, Tilley
- 10:00 B) Project 2007-05 Jack Stickel and Team  
Team includes: Doherty, Greenfield, Gustafson, Pape, Patterson
- 10:50 A) Project 2009-05 Ralph Patterson and Team  
Team includes: Hoffman, Kernan, Stickel
- 10:50 B) Project 2010-01 Tina Greenfield and Team  
Team includes: Adams, Gustafson, Kernan, Smithson

#### **11:45 Break for Lunch**

#### **1:00 Project Mini-Meetings (continued)**

- 1:00 A) Project 2010-03 Max Perchanok and Team  
Team includes: Doherty, Drobot, Gustafson, Hoffman
- 1:00 B) Projects 2007-03 and 2009-06 Tina Greenfield and Teams  
Teams include: Drobot, Kernan, Kisse, Patterson, Perchanok, Tilley

#### **2:30 Tour of Utah DOT Traffic Management Facility**

#### **6:00 Friends of Aurora Reception**

**Wednesday, April 14, 2010:**

- I. 8:00 Friends of Aurora**
- |      |                                       |                             |
|------|---------------------------------------|-----------------------------|
| 8:00 | Introductions                         | All                         |
| 8:15 | Presentation on Aurora                | Bill Hoffman/Chris Albrecht |
| 8:30 | Discussion of Ongoing Aurora Research | Aurora Project Champions    |
| 8:45 | Vendor Presentations                  | Vendors                     |
- 10:15 Break**
- II. 10:30 Friends of Aurora (continued)**
- |       |  |                |
|-------|--|----------------|
| 10:30 | Review of Vendor and Aurora Top Issues | Chris Albrecht |
| 10:45 | Open Discussion                        | All            |
| 11:45 | Review of Issues and Future Actions    | Chris Albrecht |
- 12:00 Break for Lunch**
- III. 1:00 Board Meeting Open and General Items**
- |      |   |                |
|------|---|----------------|
| 1:00 | Introductions and review/approval of agenda | Bill Hoffman   |
| 1:05 | Review of previous board actions/minutes    | Chris Albrecht |
- IV. 1:15 Project Updates**
- |      |  |                 |
|------|--|-----------------|
| 1:15 | 2000-01 - Benchmarking ... RWIS Forecasts              | Max Perchanok   |
| 1:20 | 2003-04 - Intelligent Image-Based - Phase III ...      | Dan Eriksson    |
| 1:25 | 2004-04 - Weather Index Enhancements                   | Tina Greenfield |
| 1:35 | 2005-01 - RWIS Quality Assurance Monitoring System ... | Jack Stickel    |
| 1:40 | 2005-02 - RWIS Telecommunications Issues               | Dean Kernan     |
| 1:45 | 2005-06 - New Road Surface Condition Sensor            | Dan Eriksson    |
| 1:50 | 2006-01 - Support of the Clarus Initiative             | Tina Greenfield |
| 2:00 | 2006-08 - Low Cost Mobile RWIS                         | Chris Albrecht  |
| 2:05 | 2007-01 - RWIS Equipment Monitoring II                 | Jack Stickel    |
| 2:15 | 2007-02 - Cold Weather Testing of Halliday Unit        | Scott Roeder    |
| 2:20 | 2007-03 - Incorporation of MDSS                        | Tina Greenfield |
| 2:25 | 2007-04 - Freezing Drizzle Algorithm                   | Max Perchanok   |
| 2:35 | 2007-05 - Multiple Use ITS Sites                       | Jack Stickel    |
- 2:45 Break**

- V. 3:00 Project Updates (continued)**
- |      |   |                 |
|------|---|-----------------|
| 3:00 | 2008-01 - National Testing Program            | Tina Greenfield |
| 3:10 | 2008-02 - Evaluation of Utah TOC Weather Ops  | Ralph Patterson |
| 3:20 | 2008-03 - MDSS Demo in Ontario / RWIS +       | Max Perchanok   |
| 3:30 | 2009-01 - Evaluation of the Lufft R2S         | Ralph Patterson |
| 3:40 | 2009-03 - Knowledge Base for RWIS and Loggers | Jack Stickel    |
| 3:50 | 2009-04 - Road Weather Education Enhancements | Dawn Gustafson  |
| 4:00 | 2009-05 - Further Development of PPAES        | Ralph Patterson |

**4:15 Break**

- VI. 4:30 Project Updates (continued)**
- |      |  |                 |
|------|--|-----------------|
| 4:30 | 2009-06 - Salinity Sensor Improvements and Development | Tina Greenfield |
| 4:40 | 2010-01 - Enhancements of AI/RWIS CBT                  | Tina Greenfield |
| 4:50 | 2010-02 - Mobile-Weather Data Collection Guidelines    | Bill Hoffman    |
| 5:00 | 2010-03 - Co-Funding Winter Road Research              | Max Perchanok   |
| 5:50 | 2010-04 - RWIS Sensor Density Study                    | Kirk Carpenter  |
| 5:55 | 2010-05 - Determining RPU and Sensor Failure           | Jack Stickel    |

**6:00 Adjourn**

**7:00 Group Dinner**

**Thursday, April 15, 2009:**

- VII. 8:00 Program Administration and Financial Status** Chris Albrecht
- |      |  |  |
|------|--|--|
| 8:00 | Discussion of membership payments, contributions, and agreements |  |
| 8:10 | Discussion of program expenditures and contracting issues        |  |

- VIII. 8:20 Round Robin/Member Agency RWIS Updates** All Participants

**10:00 Break**

- IX. 10:15 FHWA Mobile Observing Project** Paul Pisano

- X. 10:45 National Initiatives and Partnerships (5 minutes each)**
- |  |                |
|--|----------------|
| ENTERPRISE, MDSS, NTCIP                          | Curt Pape      |
| TRB Task Forces and Committees, ITS America, AMS | Sheldon Drobot |
| AASHTO/SICOP, Clear Roads, PNS, SIRWEC           | Chris Albrecht |
| Other Initiatives/Groups                         | All            |

**XI. 11:15 FY 2011 Work Plan and Project Development**

*12:00 Break for Lunch*

**XII. 1:00 FY 2011 Work Plan and Project Development (continued)**

**XIII. 1:35 Aurora Communications Plan Items**

Chris Albrecht

Aurora E-Newsletter

Strategic Marketing of Aurora

Peer Exchange Survey Results

New Members and Associates

**XIV. 2:10 Future Meetings and Calls**

Ralph Patterson

**XV. 2:20 Other Items**

All

*2:30 Adjourn*

# **Attachment A**

# Aurora Program Ongoing Project Status

April 9, 2010

## **FY 2000 through FY 2006**

- 2000-01: Benchmarking the Performance of RWIS Forecasts = 60% complete
- 2003-04: Intelligent Image-Based Winter Road Condition Sensor - Phase III = >95% complete
- 2004-04: Weather Index Enhancements = 90% complete
- 2005-01: Development of an RWIS Quality Assurance Monitoring System = 5% complete
- 2005-02: RWIS Telecommunications Issues and Options = >95% complete
- 2005-06: New Road Surface Condition Sensor = >95% complete
- 2006-01: Support of the Clarus Initiative = 55% complete
- 2006-08: Low Cost Mobile RWIS = 90% complete

## **FY 2007**

- 2007-01: RWIS Equipment Monitoring System - Phase II = 5% complete
- 2007-02: Cold Weather Testing of the Halliday Road Grip Unit = 90% complete
- 2007-03: Incorporation of MDSS into Winter Weather Forecasting - Phase I = 15% complete
- 2007-04: Development and Demonstration of a Freezing Drizzle Algorithm = 60% complete
- 2007-05: Multiple-Use ITS Data Collection Sites = 5% complete

## **FY 2008**

- 2008-01: Development of a National Road Weather Testing Program = 20% complete
- 2008-02: Evaluation of Utah DOT's Weather Operations/RWIS Program = >95% complete
- 2008-03: Next Generation RWIS for Canada = 30% complete

## **FY 2009**

- 2009-01: Evaluation and Inter-comparison of the Lufft R2S Sensor = 5% complete
- 2009-03: Knowledge Base for RWIS and Environmental Data Loggers = 15% complete
- 2009-04: Road Weather Education Enhancements and Dissemination = 20% complete
- 2009-05: Further Development of PPAES = 5% complete
- 2009-06: Salinity Sensor Improvements and Development = <5% complete

## **FY 2010**

- 2010-01: Enhancements of AI/RWIS CBT = 10% complete
- 2010-02: Mobile-Weather Data Collection Guidelines = <5% complete
- 2010-03: Co-Funding Winter Road Research = 5% complete
- 2010-04: RWIS Sensor Density Grid = <5% complete
- 2010-05: Determining RPU and Sensor Failure = <5% complete

## **Project Status Report**

April 7, 2010

**Project:** 2000-01: Benchmarking the Performance of RWIS Forecasts

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

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### **Status:**

- Observations and forecast are available in the MTO archive as a test case.
- Data are confirmed available from 9 agencies, with a few additional hopefuls.
- WMO has a web site devoted to forecast verification techniques.
- A stratified selection of verification sites is proposed that will characterize differences in surface temperature forecast results among synoptic weather zones, forecast horizon, and year.
- The project mini-meeting in Utah will review information available, decide how verification statistics will be selected, and which agencies' data will be used.

**Approximate % Complete:** 60 %

**Barriers/Issues:** In some cases verifications are archived for only a few months or a year.

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

### **Additional Comments:**

- This is an in-kind project for Ontario Ministry of Transportation.
- Project Team: Max Perchanok (champion), Jeff Tilley, Dave Lahn, Mike Adams, Scott Roeder, Bill Hoffman, Curt Pape, Dan Huang

## **Project Status Report**

September 28, 2009

**Project:** 2003-04: Intelligent Image-Based Winter Road Condition Sensor - Phase III

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**Champion:** Dan Eriksson, Swedish Road Administration

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### **Status:**

- This project involves a third phase of the intelligent image-based winter sensor project. The first two phases have shown to be very promising. The third phase would involve continuing research and movement of the test site to a new location to acquire more research data.
- Because of the lack of trained nets for the actual installation point, this first year has mainly had the task of retrieving pictures to be used for future training of the neural networks. Results from the two approximate nets have not been reliable.
- One could also note that the computer used for image classification has been exchanged one time during this year. The usage of industrial computers with operating systems such as Microsoft Windows 2000 has shown to be crucial for the system functionality. The field tests have shown that standard PC operating systems needs to be rebooted at least once per month in order to be kept running. For a wider future field usage, it would be better to implement the image classification analysis into the embedded system in the field stations.
- During 2004-2005, the pictures retrieved during the season 2003-2004 should be used to train new neural nets. It is not until then we know more precise what accuracy we could get from the field image classification system.
- Five classes of road conditions are possible to detect this winter 2005/2006. Dry, wet, snow, ice and tracks.
- We are in the planning process of putting out a second camera to verify that the neural network is operational in any location, not only in the test site.
- The critical second camera test site to verify that the neural network is operational in any location, not only in the test site, has been tested this last winter season and the result was not what we had expected. The accuracy on road classification from the field image classification system was far too low to be acceptable.
- The team was still waiting for a report detailing the research results.

**Approximate % Complete:** >95 %

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

### **Additional Comments:**

- This is an in-kind project for the Swedish Road Administration.
- Project Team: Dan Eriksson (champion), Max Perchanok, Dan Roosevelt

## **Project Status Report**

December 2, 2009

**Project:** 2004-04: Winter Weather Severity Index Enhancements

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**Champion:** Tina Greenfield, Iowa DOT

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**Purpose:** The objective of this project is to determine the weather events that affect winter operational performance, then, develop a software application that can automatically extract NWS data and calculate differences in weather across a region.

### **Status:**

- CTRE completed the literature review.
- A prototype index system was provided in August 2007 and a demo site was provided to the project team in January, 2008 and the team provided comments.
- Through many contract extensions, AccuWeather provided another index program in December 2008, which was still lacking some items.
- Communications and progress have been slow and termination of the project was eminent after it was found that the program could not perform some of the functions the project team had envisioned. In July 2009 the project was given another revival and AccuWeather and the project team is defining the deliverables and performance measures for finishing the project in the next contract extension.
- The program appears to be functioning well and producing reasonable index scores but it needs speed/performance improvement. AccuWeather has also agreed to add the SHRP index and more detail on the calculation of the index, but it will not contain any more index parameters than what were given in the 2008 prototype.
- After discussions between the Iowa DOT and AccuWeather, it was determined that the team would not hold on for the addition of the SHRP Index and the breakdown of the six components of the AccuWeather Index.
- AccuWeather agreed to wave Aurora's annual fee of \$5,200 for the first two years and eliminate access restrictions in order to compensate for not including these two capabilities.

**Approximate % Complete:** 90 %

**Barriers/Issues:** None.

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

### **Additional Comments:**

- This project was funded for \$50,000 in FY 2004.
- Project Team: Tina Greenfield (champion), Dennis Burkheimer, Mike Adams, Curt Pape, Kirk Carpenter.

## **Project Status Report**

September 28, 2009

**Project:** 2005-01: Development of a RWIS Quality Assurance Monitoring System

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

**Objective:** Develop a system that is modular to allow installation with different host organizations and platforms, expandable for incorporating additional quality assurance modules, accessible via the web, and holds historical database of quality assurance reports for future reference.

### **Status:**

- The project team determined there were two advantages to completing this project: 1) creating a graphical interface to provide rapid analysis for sensor performance issues, and 2) adding specific sensor parameters that Aurora members are interested in and for which the Clarus System does not support.
- The final Proof of Concept meeting (Park City UT, December 11, 2006) revealed a number of quality checks that need refining. Additionally there were stations that were mismatched to the metadata.
- Mixon-Hill has also developed a Google Map interface to display the Proof of Concept states quality checking flags for each observation. Not only is this web application very beneficial, but it provides some thought for how we might envision the Aurora project's web interface. The site offers subscription service to the output by contributor or geospatial coordinates.
- The Clarus System quality checking feedback for the proof of concept states provides quality checking on more fields than originally described at the Boulder Quality Checking Workshop. The project team is reviewing the subscription service output provided at: <http://www.clarus.mixonhill.com/observations/contributor.jsp> to tailor this project to the anticipated Clarus System output.
- The Clarus System web interface is now available at <http://www.clarus-system.com/>
- The project will use an RFP through Iowa DOT. A concept of operations will be completed in May with the draft RFP scope of work to follow.
- This project will leverage the work being done as part of Project 2007-01.
- A concept of operations will be discussed at the project mini-meetings.

**Approximate % Complete:** 5 %

**Barriers/Issues:** The final scope of work for the RFP.

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

### **Additional Comments:**

- This project was funded for \$50,000 in FY 2005 and \$50,000 in FY 2006.
- Project Team: Jack Stickel (champion), Dawn Gustafson, Curt Pape, Dan Eriksson, Mike Adams, Ralph Patterson, Tina Greenfield

## **Project Status Report**

January 8, 2010

**Project:** 2005-02: RWIS Telecommunications Issues and Options

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**Champion:** Dean Kernan, Illinois Department of Transportation

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### **Status:**

- The original goal of this effort was to investigate, and eventually implement, a plan to reduce telecommunications costs.
- This effort will look into telecommunication efficiencies of existing and new technologies for getting RWIS and other data back and forth from remote locations to the user.
- Curt Pape provided a database of communications options to Harold Dameron in 2005. Chris Albrecht worked with Harold Dameron to further develop a detailed scope.
- Harold suggested that, following a search of existing and potential data transmission methodologies, an evaluation and recommendation phase could be started. Part of the evaluation phase would include, not only B/C type evaluations, but also a qualitative determination of alternatives can be done to consider the intangible benefits of the various telecommunication options.
- Chris contacted Harold to arrange a discussion of a detailed scope and has suggested conducting a state-of-the-practice review as a first step. This effort could be conducted by CTRE for less than \$15,000.
- Further research and deeper analysis could be approved by the board.
- Work is underway at CTRE, where Dan Gieseeman has produced a revised request for information. He has also outlined a document that will summarize the responses to the request.
- The revised request for information has been sent out and several responses have been received.
- CTRE has provided a brief summary of survey responses to the project team.
- A project conference call was held on November 25 to discuss the project. A revised report is pending.
- CTRE was in the process of doing some follow up work with participating agencies.
- Calls are being scheduled with participating states for additional information, and write-ups are being prepared for each.
- A new draft final report is under review.

**Approximate % Complete:** >95 %

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

### **Additional Comments:**

- This project was funded for \$15,000 in FY 2005.
- Project Team: Dean Kernan (champion), Curt Pape, Jack Stickel

## **Project Status Report**

August 5, 2009

**Project:** 2005-06: New Road Surface Condition Sensor

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**Champion:** Dan Eriksson, Swedish Road Administration

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**Status:**

- This project aims to evaluate a prototype of a new ordinary and cheap road condition sensor to be use in combination with RWIS.
- <http://www.rwis.net/gmcgui> is the address where you could find information from the ongoing test.
- Right now the information is updated with real-time data.
- Follow the descriptions and the GMC will be installed.
- Evaluation of the results from last winter proceeds was presented in Des Moines.
- The draft report has been completed, but comments need to be addressed.

**Approximate % Complete:** >95 %

**Barriers/Issues:** None

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

**Additional Comments:**

- This is an in-kind project for the Swedish Road Administration.
- Project Team: Dan Eriksson (champion), Claude Lapointe, Lee Smithson, Joe Holt

## **Project Status Report**

September 28, 2009

**Project:** 2006-01: Support of the *Clarus* Initiative

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

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**Background:** *Clarus* is a FHWA initiative designed to collect, quality check, and make available via the Internet this nation's public investments in atmospheric and pavement observations which support surface transportation operations. The purpose of this project is to influence the *Clarus* initiative and assist with its early implementation through funding costs 1) for member participation in the *Clarus* project when the *Clarus* Initiative does not cover costs 2) associated with drafting and submitting a proposal to be the test location for the Multi-state Regional Demonstration.

**Strategy/Approach:** Once the system design is complete, it will be necessary to implement, integrate, and test *Clarus* in a Multi-state Regional Demonstration. This demonstration will be conducted at a selected location so that system components, core functions, and information management processes may be tested and improved. Aurora supports this initiative. Active participation in the design and demonstration phases will allow Aurora members to influence the product, gain knowledge of the details involved with implementation, and help promote this system.

**Status:**

- Proof-of-Concept test involved Aurora members UT, AK and MN.
- Iowa was awarded one of the Concept of Operations (ConOps) projects. IL, IN, and OH are Aurora members on this team. Aurora supported this application.
- Aurora agreed to fund other Aurora states participation in other ConOps projects.
- The study report for all three ConOps teams are at <http://www.clarusinitiative.org/regional.htm>.
- A project account was being set up to cover Clarus travel.

**Approximate % Complete:** 55 %

**Barriers/Issues:** None.

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

**Additional Comments:**

- This project was funded for \$50,000 in FY 2006.
- Project Team: Tina Greenfield (champion), Jack Stickel, Dennis Belter, Dean Kernan, Mike Adams, Scott Roeder, Bill Mahoney

## **Project Status Report**

April 6, 2010

**Project:** 2006-08: Low Cost Mobile RWIS

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**Champion:** Claude Lapointe, Quebec Ministry of Transportation

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**Purpose:** The objective is to build low cost mobile RWIS station with an open architecture to mix different sensors of different constructors. The project will involve the use of sensors on a vehicle and the use of an in-vehicle display and cell phone-based communications.

**Status:**

- Final project materials have been provided, and CWIMS staff will edit them for a final review by the board.

**Approximate % Complete:** 90 %

**Barriers/Issues:** None.

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

**Additional Comments:**

- This is an in-kind project for the Quebec Ministry of Transportation.
- The Quebec Ministry of Transportation has spent \$100,000 on this project and is in the process of securing another \$100,000 for further development.
- Project Team: Claude Lapointe (champion), Curt Pape, Kirk Carpenter, Dan Roosevelt, Dennis Burkheimer, Rudy Persaud

## **Project Status Report**

April 2, 2010

**Project:** 2007-01: RWIS Equipment Monitoring System - Phase II

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

**Objective:** Expand the *RWIS Equipment Monitoring System* developed for Project 2002-02 in four areas:

- Include in-commission rate reports with the percent of time the site was fully operational or degraded by no data received, incomplete data, or incorrect/suspicious data.
- Implement the specific changes to the RWIS Data and Reporting System proposed by the Aurora member states.
- Evaluate how site performance by sensor can be added to the application.
- Complete a Concept of Operations, system architecture, implementation plan, and deployment (assuming sufficient funding) for ingesting Clarus System quality checking output online.

**Status:**

- The proposal will incorporate the Clarus System quality checking output for objective #4.
- A detailed analysis of the Clarus System quality checking output will be completed in May. A draft scope of work will follow.
- This project will leverage the work being done as part of Project 2005-01.
- A project mini-meeting was held in Toronto in September 2008, and another is scheduled for Utah in April 2010.

**Approximate % Complete:** 5 %

**Barriers/Issues:** Final Scope of Work for RFP

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

**Additional Comments:**

- This project was funded for \$35,000 FY 2007 and FY 2008
- This project was funded for \$25,000 in FY 2007.
- Additional \$10,000 funding under FY 2008.
- Project Team: Jack Stickel (champion), Curt Pape, Tina Greenfield, Joe Doherty, Ralph Patterson

## **Project Status Report**

December 2, 2009

**Project:** 2007-02: Cold Weather Testing of the Halliday Road Grip Unit

**Champion:** Diana Clonch/Scott Roeder, Ohio Department of Transportation

### **Status:**

- Jeff Tilley is preparing a final report for presentation at the TRB show next June in Indianapolis.
- Jeff Tilley will forward a copy to Aurora when it is completed.
- Ohio DOT brought the RT3 unit back from North Dakota last week.
- A presentation on results will be made at the 4<sup>th</sup> National Conference on Surface Transportation Weather in Indianapolis.
- A project mini-meeting was held in Toronto in September 2008.
- Jeff Tilley would try to send a final report to Scott Roeder prior to the Albuquerque meeting.
- Participating states gave their comments on the draft final report, and additional technical comments were anticipated after Max Perchanok's revisions.
- Max submitted comments to Jeff Tilley early in April 2009 and a portion of these requested changes would be made by early June. Some comments were beyond the scope and would need to be addressed so the two planned a call.
- Waiting to hear back from UND.
- UND had expressed some security concerns with sharing the extra data collected on this project. It was agreed that Jeff Tilley would gather this data and forward it on to Chris Albrecht where it could be accessible upon request.

**Approximate % Complete:** 90 %

**Barriers/Issues:** None.

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

### **Additional Comments:**

- This project was funded for \$40,000 in FY 2007.
- An in-kind contribution from Ontario MOT is also a part of this effort.
- Project Team: Diana Clonch/Scott Roeder (champion), Mike Kisse, Dan Roosevelt, Max Perchanok, Tina Greenfield

## **Project Status Report**

September 28, 2009

**Project:** 2007-03: Incorporation of MDSS into Winter Weather Forecasting - Phase I

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

**Purpose:** To research, through a concept evaluation, the ability of the Pooled Fund MDSS to integrate weather forecast information from a separate forecast provider, and to provide guidance to states and forecast companies on the requirements of this type of MDSS procurement. Also, test and document the process for integrating the Federal MDSS.

**Status:**

- In April the project team switched the area of focus for this Phase 1 project to attempt to integrate the Federal Prototype instead. The Pooled Fund integration will be planned for the Phase 2 project.
- After discussing procedures and responsibilities with NCAR and Utah another change of plan was suggested to have both NCAR and a private computer/software engineering company deploy the MDSS at Utah.
- A scope of work and budget was submitted by NCAR in July 2007.
- A contract was submitted to NCAR after a long approval process, but the wording was found to be unacceptable. The contract went through several revisions and reviews by NCAR/UCAR and DOT attorneys but to date is not resolved.
- It currently appears that no agreement can be made.
- A project mini-meeting was held in Toronto in September 2008.
- The project is on hold until it can be re-scoped or contracted in a different way.

**Approximate % Complete:** 15 %

**Barriers/Issues:** None.

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

**Additional Comments:**

- This project was funded for \$50,000 in FY 2007.
- This project was funded for an additional \$30,000 in FY 2008.
- Overall project funding was reduced to \$30,000, with \$50,000 being rolled back to the general program fund.
- Project Team: Tina Greenfield (champion), Ralph Patterson, Dennis Belter, Bill Mahoney, Jeff Tilley, Max Perchanok

## **Project Status Report**

April 7, 2010

**Project:** 2007-04: Development and Demonstration of a Freezing Drizzle Algorithm for ESS

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

### **Status:**

- Phase 1 was completed in October 2008.
- This remaining work is Phase 2.
- A verbal progress report was provided at the end of March, along with statistical data from the 2008-09 field season, in lieu of the planned October 15 and November 30 reports.
- NCAR identified a possible sensor calibration problem and will either correct the entire data set or will provide revised calibration coefficients to UND by mid April.
- The report will include analysis of the corrected data from both seasons stratified into 2 or 3 synoptic types, and will compare results from the stand-alone Rosemont with results obtained when the Rosemont data are pre-classified using Geonor precipitation rate data.
- The report will include a chapter on calibration of the Rosemont including both theoretical and practical aspects.
- A complete draft report will be ready for review by June 10.

**Approximate % Complete:** 60 % (Phase 2)

**Barriers/Issues:** **None.** On track to meet revised schedule

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

### **Additional Comments:**

- This project was funded for \$15,000 in FY 2007 and \$70,000 in FY 2008
- Project Team: Max Perchanok (champion), Sheldon Drobot, Jeff Tilley, Curt Pape, Mike Adams

## **Project Status Report**

September 28, 2009

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

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

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### **Status:**

- The overall objective of this project remains the same – use RWIS sites for different types of data collection. The goals, however, have been slowly evolving over the past two years. The current project goal is to integrate non-intrusive traffic data collection devices into a RWIS site. There is a realization that each DOT has unique IT infrastructure, power, communication, traffic data needs, and contractual relationships. There needs to be different, specific solutions to meet these challenges. Therefore, the two goals for project are:
  - Document existing DOT programs for non-intrusive traffic data collection among AURORA states. This would include Utah, New York, and Iowa.
  - Develop a software solution for full Wavetronix integration for the SSI Linux RPU (LX-RPU). A prototype would be deployed for an AURORA state (Alaska); other AURORA states would be eligible to follow on at a reduced cost. Alaska DOT has a quote for the LX-RPU integration and is ready to go to work.
- The non-intrusive RWIS traffic integration from other states could be documented as part of Aurora Project 2009-03 “*Knowledge Base for RWIS*”.
- Other options for this project would include air quality monitoring for:
  - 1) Ozone O3
  - 2) Nitrogen Dioxide O2
  - 3) Carbon Monoxide CO
  - 4) Volatile Organic Compounds VOC
  - 5) Carbon Dioxide CO2
  - 6) Sulphur Dioxide SO2
  - 7) Hydrogen Sulphide H2S
  - 8) Particulate PM10
  - 9) PM2.5

\*This would require increased funding to test this.
- A concept of operations will be reviewed at the September AURORA board meeting.

**Approximate % Complete:** 5 %

**Barriers/Issues:** Final scope of work for RFP

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

### **Additional Comments:**

- This project was funded for \$35,000 in FY 2007
- Project Team: Jack Stickel (champion), Tina Greenfield, Joe Doherty, Ralph Patterson, Curt Pape, Dawn Gustafson

## **Project Status Report**

September 28, 2009

**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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**Objective:** The purpose of this project is to fund Aurora to market the idea of a national testing facility to various audiences and sources of support. A national facility can help states and agencies find appropriate and well-suited providers for transportation weather research.

**Status:**

- This project began in FY 2008.
- This project was first mentioned at the National Winter Maintenance Peer Exchange in Ohio in August of 2007. Other winter maintenance testing needs were also brought up in the Peer Exchange round-table discussions. These needs were assigned to AASHTO/SICOP at the December, 2007 meeting.
- After hearing support for a national facility from Clear Roads members, Tina helped arrange a conference call between champion 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 the facility.
- The idea of a single facility morphed into the idea of a consortium or board of experts which can help requestors of research find appropriate facilities.
- Clear Roads has committed funding. The group was waiting to hear back about additional funding from PNS.
- A Scope of Work has been drafted.

**Approximate % Complete:** 20 %

**Barriers/Issues:** None

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

**Additional Comments:**

- This project was funded for \$1,000 in FY 2008.
- This project was funded for an additional \$10,000 in FY 2009.
- Project Team: Tina Greenfield (champion), Jack Stickel, Max Perchanok, Lee Smithson

## **Project Status Report**

April 7, 2010

**Project:** 2008-02: Evaluation of Utah DOT's Weather Operations/RWIS Program

**Champion:** Ralph Patterson, Utah Department of Transportation

**Objective:** The purpose of this project is to evaluate the benefit-cost ratio of the weather operations program on winter maintenance, including the costs of labor, materials and equipment, quantify the benefits and costs of the RWIS elements of the UDOT program, quantify the benefits of the weather operations program to other UDOT users, including the TOC, and quantify the indirect benefits of the weather operations program.

**Status:**

- This project will begin in FY 2008.
- Ralph Patterson has solicited information from team members.
- A contract with WTI is in place.
- WTI has all the contact information for the TOC personnel.
- WTI is currently in the process of setting up times to conduct phone interviews.
- Most surveys have now been completed.
- WTI had prepared a draft copy of their findings which would be sent out to the group for review.
- WTI is in the process of incorporating the teams comments on the Final Report draft.

**Approximate % Complete:** >95 %

**Barriers/Issues:** None

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

**Additional Comments:**

- This project was funded for \$25,000 in FY 2008
- Project Team: Ralph Patterson (champion), Tina Greenfield, Mike Adams, Dawn Gustafson

## **Project Status Report**

April 8, 2010

**Project:** 2008-03: Next Generation RWIS for Canada / MDSS Demonstration in Ontario

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

**Objective:** The purpose of this project is to evaluate environmental, safety and cost benefits of a new generation of RWIS products and services that can be implemented to improve road maintenance in Ontario.

**Status:**

- This project was accepted as 3-year in-kind contribution by MTO.
- Seasonal Load Advisory
  - Web display of observations was implemented in fall 2009 along with an (unverified) frost depth forecast in spring 2010.
  - Relationship of frost depth to pavement modulus (strength) is progressing as new measurements come in.
  - Comparison of forecast with actual restriction dates is underway.
- Highway Frost Potential mapping
  - 2 routes identified
  - Thermal mapping was carried out for one route.
- Highway Planning and Design applications.
  - Planning is underway for procurement of expanded precip sensor network and year-round data collection

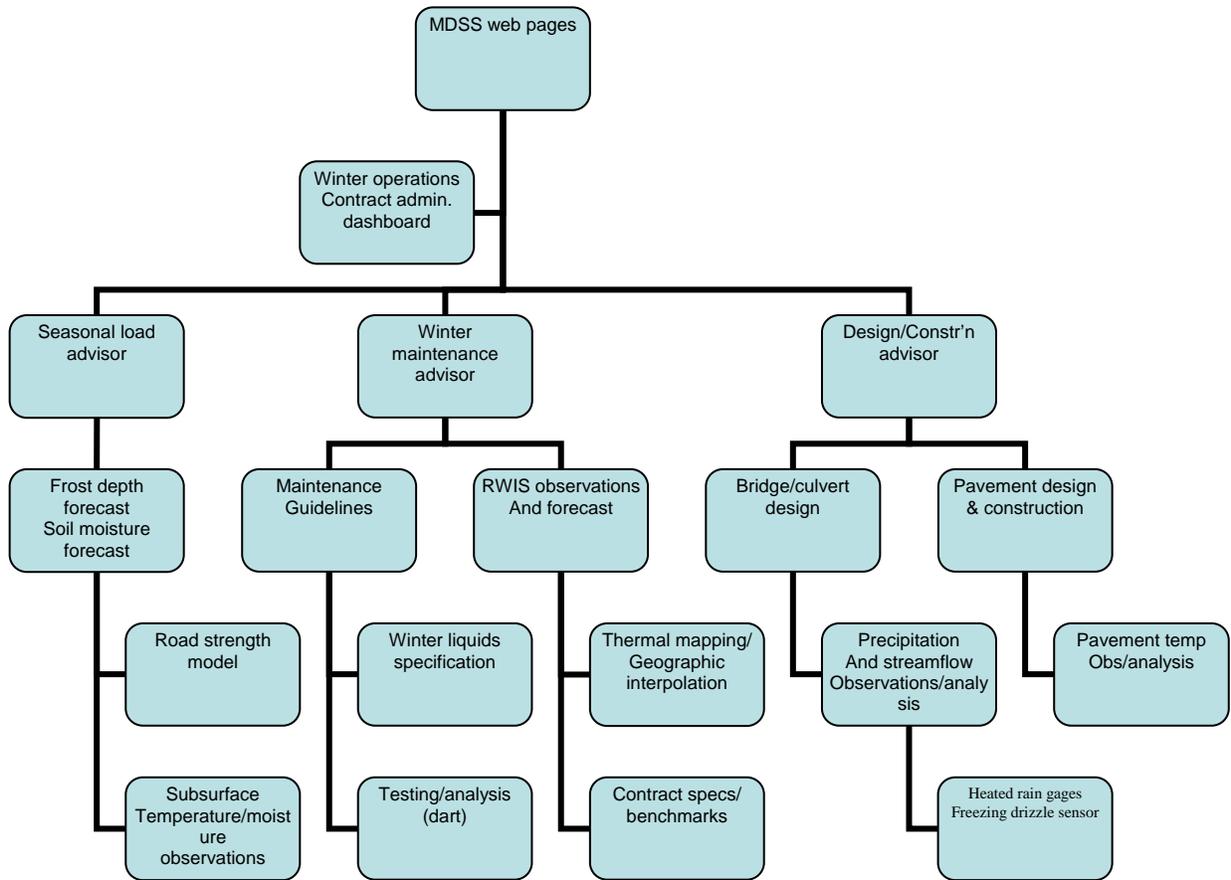
**Approximate % Complete:** 30 %

**Barriers/Issues:** Highway Frost Potential mapping and details of new work are deferred until MTO planning meeting in early June.

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

**Additional Comments:**

- This is an in-kind project for Ontario Ministry of Transportation.
- The project funding of \$75,000 in-kind will cover Ontario's membership for FY 2008, FY 2009, and FY 2010.
- Project Team: Max Perchanok (champion), Ralph Patterson, Curt Pape, Dawn Gustafson, Sheldon Drobot



## **Project Status Report**

April 2, 2010

**Project:** 2009-01: Evaluation and Inter-comparison of the Lufft R2S Sensor

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**Champion:** Ralph Patterson, Utah Department of Transportation

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**Objective:** The purpose of this project is to fund Aurora to market the idea of a national testing facility to perform an evaluation (including cross-comparison with other pre-existing precipitation sensors) of the R2S's capabilities and utilities over a full annual cycle (thus providing information on its utility to distinguish between very light drizzle and fog/mist droplets, as well as various frozen precipitation types).

**Status:**

- This project will begin in FY 2009.
- A scope is being reviewed.
- Minnesota and New York are in the process of conducting tests.
- The group planned to give multiple awards for completion of sensor analysis.
- It was considered that the approach change to comparison of outputs from multiple sensors.
- The project is on hold:
  - Awaiting feedback from Curt's efforts on a similar project currently in progress.
  - Development of a multi-award contract to be sent out to agencies, universities, and private companies who are interested and capable to bid Aurora projects focused on instrumentation testing and analysis.
- An RFP draft will be discussed during the board meeting in Des Moines.

**Approximate % Complete:** 5 %

**Barriers/Issues:** None

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

**Additional Comments:**

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

## **Project Status Report**

April 9, 2009

**Project:** 2009-03: Knowledge Base for RWIS Programs and Environmental Data Loggers

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

**Objective:** The objective of this project is to develop a web-enabled knowledge base (wiki-like) that allows sharing and retrieval of road weather information, with specific emphasis on data loggers. The application will have a search capability, various levels of administrative update control, be easy to update, and include capabilities for adding/replacing material. The knowledge base might have links to web-based information, stand alone articles, user manuals, and frequently asked questions. The data logger knowledge base may contain:

- commonly user sensor configurations, setup, and operation
- Site setup and environmental considerations
- Data logger programs
- Troubleshooting information
- Best practices

**Status:**

- A conference call was held with CTRE support staff and the project team to discuss options for completing the project.
- CTRE has the capability to produce the knowledge base, and a budget and scope were prepared and sent to Jack Stickel.
- The team held another call to discuss further the desired capabilities for the site, and Jack will prepare a draft Concept of Operations that was distributed for the group to review.

**Approximate % Complete:** 15 %

**Barriers/Issues:** None

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

**Additional Comments:**

- This project was funded for \$20,000 in FY 2009
- Project Team: Jack Stickel (champion), Ralph Patterson, Max Perchanok, Curt Pape, Jeff Tilley

## **Project Status Report**

April 9, 2010

**Project:** 2009-04: Road Weather Education Enhancements and Dissemination

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

**Objective:** The objective of this project is to develop methods and/or materials to disseminate existing road weather and RWIS educational materials.

### **Status:**

- A call was held and the following questions arose:
  1. What materials need to be covered by this umbrella?
  2. What materials are out there, but are difficult to access?
  3. What educational materials are lacking and need to be developed?
- This idea stemmed from the 2007 peer exchange and it was considered to present this topic for discussion again at the 2009 peer exchange for additional input into the project's focus.
- Mike Adams had shared that the Wisconsin DOT library would be able to perform a literature search and assist in developing and distributing a survey for the group free of charge, so the group agreed to proceed through them for Phase I.
- Literature search came back.
- Team meet via phone to discuss.
- In general, most information obtained showed heavy use of AASHTO AI/RWIS training. Does this provide what is needed? Can we set up some guidance as to what training would be helpful for AI or RWIS (individually)? Further information will be gathered from participating states via interviews.
- Project mini meeting will be held in Salt Lake City

**Approximate % Complete:** 20 %

**Barriers/Issues:** None

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

### **Additional Comments:**

- This project was funded for \$20,000 in FY 2009
- Project Team: Dawn Gustafson (champion), Max Perchanok, Ralph Patterson, Jeff Tilley, Mike Adams

## **Project Status Report**

December 2, 2009

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

**Champion:** Ralph Patterson, Utah Department of Transportation

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**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:**

- The process of writing up the contract for professional services is underway.
- The contract was sent back to the Iowa DOT for review after additional changes from UND.
- The Iowa DOT made a formatting change to the initial contract, and the new draft contract is now with UND for review.

**Approximate % Complete:** 5 %

**Barriers/Issues:** None

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

**Additional Comments:**

- This project was funded for \$83,000 in FY 2009
- Project Team: Ralph Patterson (champion), Jack Stickel, Dean Kernan, Bill Hoffman

## **Project Status Report**

September 28, 2009

**Project:** 2009-06: Salinity Sensor Improvements and Development

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

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**Objective:** The objective of this project is to survey state transportation agencies to gauge interest in purchasing and utilizing on-vehicle chemical sensors, and if so, how many and at what price. Clear Roads would be a likely partner on such an effort.

**Status:**

- This project began in FY 2009.
- Clear Roads did not approve the project.
- It was considered that this project be done with a pooled fund-type scope.
- CTRE could complete a survey baring in mind the following questions:
  1. What are the needs?
  2. How will this be used?
  3. What amount of payment would be reasonable?
  4. What quantity would be needed?

**Approximate % Complete:** <5 %

**Barriers/Issues:** None

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

**Additional Comments:**

- This project was funded for \$50,000 in FY 2009
- Project Team: Tina Greenfield (champion), Max Perchanok, Dean Kernan, Mike Kisse, Jeff Tilley

## **Project Status Report**

April 2, 2010

**Project:** 2010-01: Enhancements of AI/RWIS CBT

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

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**Status:**

- This project is new for FY 2010.
- A conference call was held in March to discuss this project.

**Approximate % Complete:** 10 %

**Barriers/Issues:** None

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

**Additional Comments:**

- This project was funded for \$50,000 in FY 2010
- Project Team: Tina Greenfield (champion), Dawn Gustafson, Mike Adams, Max Perchanok, Jeff Tilley

## **Project Status Report**

February 15, 2010

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

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**Champion:** Bill Hoffman, Nevada Department of Transportation

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**Status:**

- This project is new.

**Approximate % Complete:** <5 %

**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: Needs to be finalized

## **Project Status Report**

April 8, 2010

**Project:** 2010-03: Co-Funding Winter Road Research

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

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**Status:**

- Three-year agreement is in place for MTO funding, and graduate students are at work.
- The agreement with Aurora is pending.
- Major components:
  - Evaluation and Intercomparison of road surface condition monitoring and prediction tools, and their sampling regimes
  - Modeling of safety and mobility in relation to road surface condition
  - Development of tools to analyze and evaluate the relation between alternative winter maintenance performance standards, and outcomes of safety and mobility.

**Approximate % Complete:** 5 %

**Barriers/Issues:** Completion of contract with Aurora and development of a detailed workplan and schedule.

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

**Additional Comments:**

- This project was funded for \$120,000 in FY 2010
- Project Team: Max Perchanok (Champion), Bill Hoffman, Dawn Gustafson, Joe Doherty, Sheldon Drobot, Neil Hawkins, Chris Albrecht

## **Project Status Report**

February 15, 2010

**Project:** 2010-04: RWIS Sensor Density Grid

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**Champion:** Kirk Carpenter, Indiana Department of Transportation

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**Status:**

- This project is new for FY 2010.

**Approximate % Complete:** <5 %

**Barriers/Issues:** None

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

**Additional Comments:**

- This project was funded for \$100,000 in FY 2010
- Project Team: Needs to be finalized

## **Project Status Report**

February 15, 2010

**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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**Status:**

- This project is new.

**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 2010
- Project Team: Needs to be finalized