

Aurora Program

minutes

**Aurora Board Meeting
February 24-26, 2009 – Albuquerque, New Mexico, USA**

Individuals Participating in the Meeting:

Ralph Patterson, Utah DOT
Jack Stickel, Alaska DOT&PF
Curt Pape, Minnesota DOT
Dean Kernan, Illinois DOT
Max Perchanok, Ontario MOT
Kirk Carpenter, Indiana DOT
Scott Roeder, Ohio DOT
Tina Greenfield, Iowa DOT
Tim Timbrook, New York DOT
Bill Hoffman, Nevada DOT
Lee Smithson, AASHTO
Chris Albrecht, Iowa State University

I. Friends of Aurora

Introductions – Aurora Chair Ralph Patterson welcomed everyone to the meeting, noting that there were several guests in attendance. He then asked everyone to introduce themselves, which they did.

Presentation on Aurora – Ralph then gave a brief presentation on the Aurora Program and the goals of its research program.

Discussion of Ongoing Research – Next, Ralph and project champions reviewed several of the research efforts currently underway and answered questions from vendors.

Vendor Presentations – Following the discussion of Aurora research, each vendor in attendance was given time to meet with the Aurora Board to discuss/present the role of their company in the greater RWIS and road weather community. Presentations were heard from Meridian, Ameritrak, Campbell Scientific, Quixote, Vaisala, DTN, and Mixon-Hill.

II. Friends of Aurora (continued)

After a short break, the vendors and Aurora board members met to discuss various topics that had been raised during the presentations, as well as during previous Friends of Aurora events. Chris Albrecht reviewed a list of top discussion topics he had compiled. Among these topics were data consistency and standards, MDSS, 511 and traveler information, the Clarus Initiative, state purchasing requirements, thermal imaging, NWS standards, partnering between public and private groups, and the expanded use of RWIS into non-traditional areas.

Prior to ending the Friends of Aurora session, Ralph Patterson again thanked the visitors for attending.

III. Open and General Items

Introductions and Approval of Agenda – Ralph began the formal board meeting by asking the members to review the meeting agenda. After a few minor 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 Board Minutes – Chris Albrecht then reviewed the draft minutes from the October and December 2008 board conference calls. After a short discussion, the minutes were approved. Chris noted that he would post the minutes on the program website.

Review of Current Actions – Chris also noted that the board had asked him to prepare a summary table/chart of board members assigned to project teams. He handed out copies of this chart. A short discussion followed, wherein Ralph encouraged new volunteers to serve on project teams as each was reviewed under the next agenda item. *A copy of this chart is attached to these minutes as Attachment A.*

IV. Project Updates

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

Project 2000-01 – Benchmarking the Performance of RWIS Forecasts: Max Perchanok reviewed this project, noting that administrative problems at MTO continue to delay the project, although a little progress has been made.

Project 2000-05 – RWIS Leverage Opportunities: No update was provided for this effort.

Project 2003-04 – Intelligent Image-Based Winter Road Condition Sensor - Phase III: No update was provided for this effort.

Project 2004-04 – Winter Weather Severity Index Enhancements: Tina Greenfield reviewed this project, noting that AccuWeather had not delivered new products recently. After a discussion, the board agreed to give AccuWeather additional time to address the project team's comments.

Project 2005-01 – Development of a RWIS Quality Assurance Monitoring System: Jack Stickel noted that he had sent information to the team so that they can develop a scope of work.

Project 2005-02 – RWIS Telecommunications Issues and Options: Chris Albrecht noted that they had received nearly all responses back for the case studies portion of the report.

Project 2005-03 – Mobile Weather and Road Condition Reporting: Kirk Carpenter reported on this project, noting it was essentially complete pending a few remaining comments on the final report produced by Purdue University.

Project 2005-06 – New Road Surface Condition Sensor: No update was provided for this effort.

Project 2006-01 – Support of the *Clarus* Initiative: Tina Greenfield reviewed this project, noting that they are waiting for the Clarus team before any new actions are taken.

V. Project Updates (continued)

Project 2006-02 – Pilot Test of ESS Sensor Testing Guidelines: Ralph Patterson led the discussion on this effort, noting that the project team is deciding what direction to take this project or to possibly cancel it.

Project 2006-03 – Update of SHRP H-350 and H-351: Tina Greenfield noted that WTI is making good progress on the project, currently working with Michigan DOT to obtain information.

Project 2006-04 – Evaluation of Vaisala Spectro Pavement Sensor: Jeff Tilley reported that Vaisala had requested to review the report prior to final editing. The board agreed to allow 2 weeks for this review.

Project 2006-05 – Technology Transfer of Alternative Inexpensive RWIS: Jack Stickel reviewed this project, noting that he would be putting together a concept of operations to ultimately develop the RFP.

Project 2006-08 – Low Cost Mobile RWIS: No update was provided for this effort.

Project 2007-01 – RWIS Equipment Monitoring System – Phase II: Jack Stickel noted that he had sent information to the team recently in order to get the project on track.

Project 2007-02 – Cold Weather Testing of the Halliday Road Grip Unit: Scott Roeder and Max Perchanok reviewed the latest with this effort. Discussion followed concerning the data used for the analysis, noting additional data from Ontario could be of use.

Project 2007-03 – Incorporation of MDSS into Winter Weather Forecasting- Phase I: Tina Greenfield noted that nothing new had happened concerning this effort recently.

Project 2007-04 – Development and Demonstration of a Freezing Drizzle Algorithm for ESS: Max Perchanok and Jeff Tilley discussed this project, noting that slow, but steady progress was being made.

Project 2007-05 – Multiple-Use ITS Data Collection Sites: Jack reported that little progress had been made since the last meeting.

VI. Project Updates (continued)

Project 2008-01 – Development of a National Road Weather Testing Program: Tina Greenfield reviewed this project, noting that there was not much new to report.

Project 2008-02 – Evaluation of Utah DOT’s Weather Operations/RWIS Program: Ralph Patterson discussed this effort, noting that progress is moving ahead nicely with WTI.

Project 2008-03 – Next Generation RWIS for Canada: Max Perchanok briefly reviewed the planned actions for the project.

Project 2009-01 – Evaluation and Inter-comparison of the Lufft R2S Sensor – Ralph Patterson noted that the project team was waiting for New York and Minnesota to finish their testing of the sensor.

Project 2009-02 – Road Weather Information Outreach/Second Peer Exchange – Lee Smithson led the review of this project. Things had been moving along well, he noted.

Project 2009-03 – Knowledge Base for RWIS and Environmental Data Loggers – Nothing new was reported concerning this new effort.

Project 2009-04 – Road Weather Education Enhancements and Dissemination – No report was provided for this effort.

Project 2009-05 – Further Development of Pavement Precipitation Accumulation Estimation System – Ralph reported that he has only been working on contractual issues for this project so far.

Project 2009-06 – Salinity Sensor Improvements and Development – Tina Greenfield noted that the project team would need to meet to review options for this effort, since Clear Roads was not interested in pursuing a joint effort.

Project 2009-07 – Review of Friction Detection Technologies – Nothing new was reported for this effort.

VII. Program Administration and Financial Status

Next, Chris Albrecht reviewed the financial spreadsheet he used to track member agency contributions. After a short discussion about outstanding payments, Chris noted he would follow-up with agencies that had outstanding issues.

VIII. Member Agency Updates

Next, some of the agencies in attendance gave very brief reviews of their recent winter maintenance and road weather-related activities.

IX. National Initiatives and Partnerships

Next, the board briefly reviewed RWIS-related national initiatives. Curt Pape reviewed the latest with MDSS and NTCIP, while Lee Smithson reviewed the latest with AASHTO-SICOP and the TRB Winter Maintenance Committee.

X. TR News Issues

The board briefly discussed which Aurora initiatives to focus on for possible inclusion in the upcoming TR News focus on winter weather. After a short discussion, it was agreed that the first equipment monitoring project, MDSS, and the peer exchange in 2007 should be highlighted.

XI. Aurora Communications Plan

The board agreed to skip this topic until a later meeting or conference call.

XII. Future Aurora Meetings and Calls

After some discussion, future board calls were scheduled for April 16, June 4, and August 6, 2009. It was also agreed that the next board meeting should take place in Des Moines in the fall.

XIII. Other Aurora Items

Nothing further was discussed, and the meeting was adjourned.

Agenda

Aurora Program Board Meeting

February 24-26, 2009

Holiday Inn Select Airport, Albuquerque, New Mexico, USA

AGENDA

Tuesday, February 24, 2009:

- 1:00 Project Mini-Meetings
- 2:45 Break
- 3:00 Project Mini-Meetings (continued)
- 5:00 Adjourn
- 6:00 Friends of Aurora Reception

Wednesday, February 25, 2009:

- I. 8:00 Friends of Aurora
 - 8:00 Introductions All
 - 8:15 Presentation on Aurora Ralph Patterson
 - 8:30 Discussion of Ongoing Aurora Research Aurora Project Champions
 - 9:00 Vendor Presentations Vendors
- 10:00 Break
- II. 10:15 Friends of Aurora (continued)
 - 10:15 Review of Vendor Discussion Topics Chris Albrecht
 - 10:20 Open Discussion All
 - 11:45 Review of Issues and Future Actions Chris Albrecht
- 12:00 Break for Lunch
- III. 1:00 Open and General Items
 - 1:00 Introductions and review/approval of agenda Ralph Patterson
 - 1:05 Review of previous board minutes Chris Albrecht
 - 1:10 Review of current actions Chris Albrecht

IV.	1:15	Project Updates	
	1:15	2000-01 - Benchmarking ... RWIS Forecasts	Max Perchanok
	1:25	2000-05 - RWIS Leveraging Opportunities	Lee Smithson
	1:35	2003-04 - Intelligent Image-Based - Phase III ...	Dan Eriksson
	1:45	2004-04 - Weather Index Enhancements	Tina Greenfield
	1:55	2005-01 - RWIS Quality Assurance Monitoring System ...	Jack Stickel
	2:05	2005-02 - RWIS Telecommunications Issues	Dean Kernan
	2:15	2005-03 - Mobile Weather Reporting	Chris Albrecht
	2:25	2005-06 - New Road Surface Condition Sensor	Dan Eriksson
	2:35	2006-01 - Support of the Clarus Initiative	Tina Greenfield

2:45 *Break*

V.	3:00	Project Updates (continued)	
	3:10	2006-02 - Pilot Test of ESS Guidelines	Ralph Patterson
	3:20	2006-03 - Update of SHRP H-350 and H-351	Tina Greenfield
	3:30	2006-04 - Evaluation of Vaisala Spectro Sensor	Chris Albrecht
	3:40	2006-05 - T ² of Alternative Inexpensive RWIS	Jack Stickel
	3:50	2006-08 - Low Cost Mobile RWIS	Chris Albrecht
	4:00	2007-01 - RWIS Equipment Monitoring II	Jack Stickel
	4:10	2007-02 - Cold Weather Testing of Halliday Unit	Scott Roeder
	4:20	2007-03 - Incorporation of MDSS	Tina Greenfield
	4:30	2007-04 - Freezing Drizzle Algorithm	Max Perchanok
	4:40	2007-05 - Multiple Use ITS Sites	Jack Stickel

4:45 *Break*

VI.	5:00	Project Updates (continued)	
	5:00	2008-01 - National Testing Facility	Tina Greenfield
	5:10	2008-02 - Evaluation of Utah TOC Weather Ops	Ralph Patterson
	5:20	2008-03 - MDSS Demo in Ontario	Max Perchanok
	5:30	2009-01 - Evaluation of the R2S	Ralph Patterson
	5:40	2009-02 - Second Peer Exchange	Tina Greenfield
	5:50	2009-03 - Knowledge Base for RWIS and Loggers	Jack Stickel
	6:00	2009-04 - Road Weather Education Enhancements	Dawn Gustafson
	6:10	2009-05 - Further Development of PPAES	Ralph Patterson
	6:20	2009-06 - Salinity Sensor Improvements and Development	Tina Greenfield
	6:25	2009-07 - Review of Friction Detection Technologies	Max Perchanok

6:30 *Adjourn*

7:15 *Group Dinner*

Thursday, February 26, 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
8:25 Discussion of CTRE management contract
- VIII. 8:30 Round Robin/Member Agency RWIS Updates** All Participants
- 10:00 Break*
- IX. 10:15 National Initiatives and Partnerships (5 minutes each)**
ENTERPRISE, MDSS, NTCIP Curt Pape
TRB Task Forces and Committees, ITS America, AMS Bill Mahoney
AASHTO/SICOP, Clear Roads, PNS, SIRWEC Chris Albrecht
Other Initiatives/Groups All
- X. 10:45 Aurora Communications Plan** Chris Albrecht
- XI. 11:15 Future Meetings and Calls** Ralph Patterson
- XII. 11:30 Other Items** All
- 11:45 Adjourn*

Attachment A

Project	Alaska	Illinois	Indiana	Iowa	Michigan	Minnesota	Nevada	New York	N. Dakota	Ohio	Ontario	Penn.	Quebec	S. Dakota	Sweden	Tenn.	Utah	Virginia	Wisconsin	Others
Completed Research Projects:																				
1997-01 - RWIS Institutional Issues				Smithson		Wikelius Fleegle					Girard			Huft	Eriksson			Roosevelt	Adams	Pisano
1997-02 - RWIS Communications Standards				Smithson		Pape					Perchanok Perchanok	Uzokwe			Eriksson Eriksson					Bullock, DeLannoy Bullock
1997-03 - Expert System for Maintenance Decision Support				Smithson		Pape					Perchanok Perchanok	Uzokwe			Eriksson Eriksson					
1997-04 - Adaptation of the Local Climatological Model in New Areas				Smithson		Pape					Perchanok Perchanok	Uzokwe			Eriksson Eriksson			Roosevelt	Adams	Pisano
1997-05 - Standardized Weather and Road Condition Information				Smithson		Pape					Perchanok Perchanok	Uzokwe			Eriksson Eriksson			Roosevelt	Adams	Pisano
1998-02 - Standardized Testing Methodologies for Pavement Sensors				Smithson		Pape		Sambuca			Perchanok Perchanok	Uzokwe Uzokwe			Eriksson Eriksson	Holt		Roosevelt	Adams	Pisano
1999-01 - Compilation of RWIS Specifications				Smithson		Pape		Sambuca			Perchanok Perchanok	Uzokwe Uzokwe			Eriksson Eriksson	Holt		Roosevelt	Adams	Pisano
1999-02 - Road Weather Roadshow				Smithson		Pape		Sambuca			Perchanok Perchanok	Uzokwe Uzokwe			Eriksson Eriksson	Holt		Roosevelt	Adams	Pisano
2000-02 - Synthesis of National Road Weather Forecasting		Dameron				Pape					Perchanok Perchanok	Uzokwe			Eriksson Eriksson	Holt		Roosevelt	Adams	Pisano Smithson
2000-04 - Computer-Based Training Development		Dameron				Pape					Perchanok Perchanok	Uzokwe			Eriksson Eriksson	Holt		Roosevelt	Adams	Pisano Smithson
2000-07 - Road Weather Training Program for Improved Winter Response						Pape					Perchanok Perchanok	Uzokwe			Eriksson Eriksson	Holt		Roosevelt	Adams	Pisano Smithson
2000-08 - Intelligent Image-Based Winter Road Sensor – Phase I						Pape					Perchanok Perchanok	Uzokwe			Eriksson Eriksson	Holt		Roosevelt	Adams	Pisano, Smithson, Maze
2001-01 - Interjurisdictional Traveler Information Exchange		Dameron			Burkheimer	Pape					Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Pisano, Smithson
2001-02 - Guidelines for Pavement Sensors					Burkheimer	Pape					Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Pisano, Smithson
2001-03 - RWIS Data Integration and Sharing Guidelines					Burkheimer	Pape					Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Pisano, Smithson
2001-04 - Pavement Temperature Sensor Accuracy					Burkheimer	Pape					Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Pisano, Smithson
2002-01 - Intelligent Image-Based Winter Road Sensor – Phase II					Burkheimer	Pape					Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Pisano, Smithson
2002-02 - RWIS Equipment Monitoring System		Stickel		Belter	Burkheimer	Pape					Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Smithson
2003-01 - Improved Frost Forecast Model – Phase I		Stickel		Belter	Burkheimer	Pape					Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Smithson
2003-02 - Off-the-Shelf Component RWIS		Stickel			Burkheimer	Pape					Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Smithson
2003-05 - Investigation of the Variability of Snow Cover Conditions					Burkheimer	Pape					Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Pisano, Smithson Mahoney
2004-01 - Hot Plate Snow Gauge Demonstration		Stickel			Burkheimer	Pape					Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Pisano, Smithson Mahoney
2004-02 - Laser Road Surface Sensor					Burkheimer	Pape					Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Pisano, Smithson
2004-03 - Support of the MDSS Pooled Fund Study					Burkheimer	Pape		Doherty			Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Pisano, Smithson
2004-05 - Improved Frost Forecast Model – Phase II					Burkheimer	Pape					Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Pisano, Smithson
2005-04 - Integration of Road Weather Information with Traffic Data					Burkheimer	Pape					Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Pisano, Smithson
2005-05 - Using RWIS to Trigger Spring Load Restrictions		Stickel	Kernan		Burkheimer	Pape			Kisse		Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Tilley
2006-07 - Road Weather Information Outreach / National Conference				Belter	Greenfield	Pape				Clonch	Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Tilley
Ongoing Research Projects:																				
2000-01 - Benchmarking the Performance of RWIS Forecasts						Pape					Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Lahn, Tilley Smithson
2000-05 - RWIS Leverage Opportunities		Kernan				Pape					Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Lahn, Tilley Smithson
2003-04 - Intelligent Image-Based Winter Road Sensor – Phase III						Pape					Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Lahn, Tilley Smithson
2004-04 - Weather Index Enhancements				Belter	Greenfield	Pape					Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Lahn, Tilley Smithson
2005-01 - Development of an RWIS Quality Assurance Monitoring System	Stickel		Belter	Greenfield	Gustafson	Pape					Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Lahn, Tilley Smithson
2005-02 - RWIS Telecommunications Issues and Options	Stickel	Kernan	Belter	Greenfield	Gustafson	Pape					Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Lahn, Tilley Smithson
2005-03 - Mobile Weather and Road Condition Reporting			Carpenter	Greenfield	Gustafson	Pape		Kisse			Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Lahn, Tilley Smithson
2005-06 - New Road Surface Condition Sensor				Greenfield	Gustafson	Pape				Clonch	Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Smithson Mahoney Mahoney
2006-01 - Support of the Clarus Initiative	Stickel	Kernan	Belter	Greenfield	Gustafson	Pape				Clonch	Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Smithson Mahoney Mahoney
2006-02 - Pilot Test of ESS Sensor Testing Guidelines	Stickel			Greenfield	Gustafson	Pape	Hoffman		Doherty		Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Smithson Mahoney Mahoney
2006-03 - Update of SHRP H-350 and H-351				Greenfield	Gustafson	Pape			Doherty		Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Smithson Mahoney Mahoney
2006-04 - Evaluation of Vaisala Spectro Pavement Sensor				Greenfield	Gustafson	Pape			Doherty		Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Smithson Mahoney Mahoney
2006-05 - Technology Transfer (T2) of Alternative Inexpensive RWIS	Stickel			Greenfield	Gustafson	Pape			Doherty		Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Smithson Mahoney Mahoney
2006-08 - Low Cost Mobile RWIS				Greenfield	Gustafson	Pape			Doherty		Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Smithson Mahoney Mahoney
2007-01 - RWIS Equipment Monitoring System Enhancements	Stickel		Carpenter	Greenfield	Gustafson	Pape			Doherty		Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Smithson Mahoney Mahoney
2007-02 - Cold Weather Testing of the Holiday Road Grip Unit				Greenfield	Gustafson	Pape			Doherty		Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Smithson Mahoney Mahoney
2007-03 - Incorporation of MDSS into Winter Weather Forecasting			Belter	Greenfield	Gustafson	Pape		Kisse	Clonch		Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Smithson Mahoney Mahoney
2007-04 - Development and Demonstration of Freezing Drizzle Algorithm				Greenfield	Gustafson	Pape			Doherty		Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Smithson Mahoney Mahoney
2007-05 - Multiple-Use ITS Data Collection Sites	Stickel			Greenfield	Gustafson	Pape			Doherty		Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Smithson Mahoney Mahoney
2008-01 - Development of a National Road Weather Testing Facility	Stickel			Greenfield	Gustafson	Pape			Doherty		Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Smithson Mahoney Mahoney
2008-02 - Evaluation of Utah DOT's Weather Operations/RWIS Program				Greenfield	Gustafson	Pape			Doherty		Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Smithson Mahoney Mahoney
2008-03 - Next Generation RWIS for Canada/MDSS in Ontario				Greenfield	Gustafson	Pape			Doherty		Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Smithson Mahoney Mahoney
2009-01 - Evaluation and Inter-comparison of the Luft R2S Sensor	Stickel	Kernan		Greenfield	Gustafson	Pape			Doherty		Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Smithson Mahoney Mahoney
2009-02 - Road Weather Information Outreach / Second Peer Exchange		Kernan		Greenfield	Gustafson	Pape	Hoffman		Kisse		Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Smithson Mahoney Mahoney
2009-03 - Knowledge Base for RWIS and Environmental Data Loggers	Stickel			Greenfield	Gustafson	Pape			Doherty		Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Smithson Mahoney Mahoney
2009-04 - Road Weather Education Enhancements and Dissemination				Greenfield	Gustafson	Pape			Doherty		Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Smithson Mahoney Mahoney
2009-05 - Further Development of PPAES	Stickel	Kernan		Greenfield	Gustafson	Pape	Hoffman		Kisse		Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Smithson Mahoney Mahoney
2009-06 - Salinity Sensor Improvements and Development		Kernan		Greenfield	Gustafson	Pape			Doherty		Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Smithson Mahoney Mahoney
2009-07 - Review of Friction Detection Technologies				Greenfield	Gustafson	Pape	Hoffman	Doherty			Perchanok Perchanok	Uzokwe		Lapointe	Eriksson Eriksson	Holt		Roosevelt	Adams	Smithson Mahoney Mahoney

Attachment B

Aurora Program Ongoing Project Status

February 20, 2009

FY 2000 through FY 2004

- 2000-01: Benchmarking the Performance of RWIS Forecasts = 40% complete
- 2000-05: RWIS Leverage Opportunities = \$31,000 in funding available
- 2003-04: Intelligent Image-Based Winter Road Condition Sensor - Phase III = >95% complete
- 2004-04: Weather Index Enhancements = 60% complete

FY 2005

- 2005-01: Development of an RWIS Quality Assurance Monitoring System = 5% complete
- 2005-02: RWIS Telecommunications Issues and Options = 80% complete
- 2005-03: Mobile Weather and Road Condition Reporting = 95% complete
- 2005-06: New Road Surface Condition Sensor = >95% complete

FY 2006

- 2006-01: Support of the Clarus Initiative = 55% complete
- 2006-02: Pilot Test of ESS Sensor Testing Guidelines = 5% complete
- 2006-03: Update of SHRP H-350 and H-351 = 85% complete
- 2006-04: Evaluation of Vaisala Spectro Pavement Sensor = 95% complete
- 2006-05: Technology Transfer of Alternative Inexpensive RWIS = 5% complete
- 2006-08: Low Cost Mobile RWIS = 65% 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 = 30% complete
- 2007-05: Multiple-Use ITS Data Collection Sites = <5% complete

FY 2008

- 2008-01: Development of a National Road Weather Testing Facility = 15% complete
- 2008-02: Evaluation of Utah DOT's Weather Operations/RWIS Program = 15% complete
- 2008-03: Next Generation RWIS for Canada = <5% complete

FY 2009

- 2009-01: Evaluation and Inter-comparison of the Lufft R2S Sensor = <5% complete
- 2009-02: Road Weather Information Outreach / Second Peer Exchange = 10% complete
- 2009-03: Knowledge Base for RWIS and Environmental Data Loggers = <5% complete
- 2009-04: Road Weather Education Enhancements and Dissemination = <5% complete
- 2009-05: Further Development of PPAES = 5% complete
- 2009-06: Salinity Sensor Improvements and Development = <5% complete
- 2009-07: Review of Friction Detection Technologies = <5% complete

Project Status Report

September 25, 2008

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

Champion: Max Perchanok, Ontario Ministry of Transportation

Status:

- CTRE responded to all agencies that responded to the survey, notifying them that the project is on hold until late 2007.
- AMEC has contacted CTRE about gathering sample data for use in the completion of this project.
- Proposal was submitted by AMEC and accepted by MTO.
- Discussions are underway with MTO contract administration people.
- An RFP will be developed based on the existing statement of work and advertised in June 2008.
- Funds are available for a contract this year.
- An RFP is ready.

Approximate % Complete: 40 %

Barriers/Issues: Delay due to administrative problems at MTO.

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), Mike Adams, Dave Hughes, Jeff Tilley, Dave Lahn

Project Status Report

August 28, 2008

Project: 2000-05: RWIS Leverage Opportunities

Champion: Lee Smithson, AASHTO

Status:

- This is an opportunity area rather than a project.
- The overall goal of this effort is to consider funding any activities identified as priorities in other national or state RWIS research programs that are of interest to Aurora but cannot be solely funded by either program in the immediate future.
- Additional funding was provided to this effort under the 2000-2001 Work Plan.
- Funds designated for Project 2000-06 and for Project 2001-05 were also transferred into this reserve fund.
- As of the August 2003 board meeting, there was \$75,000 in funding set aside in this leverage fund. From this, \$34,000 was removed and designated to fund FY 2004 projects, and another \$10,000 was allocated to project 2006-04 during the December 2006 board meeting, leaving \$31,000 in the leverage fund.
- New opportunities for FY 2009 partnering, such as those resulting from the National Winter Maintenance Peer Exchange, are being investigated.

Barriers/Issues: None.

Recommendations: X continue as planned
 continue with modifications
 discontinue

Additional Comments:

- \$31,000 is available.
- Project Team: Lee Smithson (champion), Dean Kernan, Dan Roosevelt

Project Status Report

August 28, 2008

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

Champion: Dan Eriksson, Swedish Road Administration

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.
- A report detailing the research results is pending.

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, Aerotech Telub

Project Status Report

October 31, 2008

Project: 2004-04: Winter Weather Severity Index Enhancements

Champion: Tina Greenfield, Iowa DOT

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.
- The RFP was released and 3 responses were received.
- A vendor (AccuWeather) was selected.
- A prototype index system was provided last August.
- A demo site was provided to the project team in January 2008, and the team provided comments.
- AccuWeather appears to be working on our comments, but no new features or products have been delivered since.
- The contract end-date is to be extended again through summer 2008.
- Approximately 50% of the project contract has been paid to AccuWeather.
- The project team considered ending the contract, with discussion at the September 2008 board meeting, but decided to allow one more extension.

Approximate % Complete: 60 %

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: Dennis Belter (champion), Dennis Burkheimer, Mike Adams, Curt Pape, Tina Greenfield

Project Status Report

February 20, 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 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 project mini-meeting was held in Toronto in September 2008.

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

February 20, 2009

Project: 2005-02: RWIS Telecommunications Issues and Options

Champion: Dean Kernan, Illinois Department of Transportation

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.

Approximate % Complete: 80 %

Recommendations: 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, Chris Albrecht

Project Status Report

February 11, 2009

Project: 2005-03: Mobile Weather and Road Condition Reporting

Champion: Kirk Carpenter, Indiana Department of Transportation

Status:

- The objective of this project is to develop a road and weather condition reporting system that collects data electronically from remote statewide locations and delivers real time data electronically in a format to serve multiple uses.
- This project is being done in conjunction with an AVL research project being performed by Purdue University through the Joint Transportation Research Program. This project provided good technical support and a head start for the Aurora project with the report generation functions being developed.
- A paper on this project was presented at the AASHTO/TRB conference on July 19, 2006.
- During the summer months the truck software was revised to handle spot applications and to develop an interface into MDSS.
- Researchers have also worked on doing a batch data transfer using a hotspot and are trying three different hardware devices for collecting data - a laptop and two tablet devices.
- The data collected at the maintenance vehicle (snow plow) produces maps of time chemicals placed, type of chemical, application rate, vehicle speed, road temperature, and plow position. Also, road and weather conditions can be displayed.
- The data is transferred over a statewide wireless network and displayed on the INDOT GIS maps. Another feature is transferring the appropriate data into MDSS.
- In the 2006-2007 winter, 10 snow plow vehicles were equipped with the equipment described above. The equipment was placed in vehicles at three locations.
- The data collection software was developed by Purdue University. Motorola provided the data transfer software, and Purdue and INDOT worked together to produce the GIS maps.
- One advantage of the system is no monthly data transfer fees are required. Another is it utilizes departmental (GIS maps) and state resources.
- A few comments on the draft report were discussed with Purdue via conference call.
- A revised final report is pending.

Approximate % Complete: 95 %

Barriers/Issues: None.

Recommendations: continue as planned
 continue with modifications
 discontinue

Additional Comments:

- This project was funded for \$50,000 in FY 2005 and \$25,000 in FY 2006.
- Project Team: Dennis Belter (champion), Dennis Burkheimer, Joe Holt, Mike Kisse, Bob McCullouch, Kirk Carpenter

Project Status Report

August 21, 2008

Project: 2005-06: New Road Surface Condition Sensor

Champion: Dan Eriksson, Swedish Road Administration

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

December 5, 2008

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

Champion: Tina Greenfield, Iowa Department of Transportation

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. Concerning the ConOps:
 - All four states are on the Clarus map.
 - The final ConOps was submitted on January 29, 2008.
- 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>.
- Concerning the Multi-state Regional Demonstration, we think the RFP will be aimed at vendors, not government groups, so Aurora may have no role when the RFP is released.
- At this time there is nothing more to do but wait for the Clarus Initiative Team to act.

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: Dan Roosevelt (champion), Jack Stickel, Dennis Belter, Dean Kernan, Tina Greenfield, Mike Adams, Diana Clonch, Bill Mahoney

Project Status Report

December 5, 2008

Project: 2006-02: Pilot Test of ESS Sensor Testing Guidelines

Champion: Ralph Patterson, Utah Department of Transportation

Purpose: NCHRP 6-15, Testing and Calibration Methods for RWIS Sensors, is complete. The product is a manual, *Guidelines for Testing ESS Sensor*. Aurora will pilot test the guidelines in up to three member states and publish the results and findings.

Strategy/Approach: Aurora will:

- Contact member agencies for interest in participating
- Create and acquire six kits for testing ESS surface and atmospheric sensors for use by the states.
- Acquire field data acquisition equipment (e.g., hand held computer) for pilot states
- Contract for:
 - Training material on the guidelines
 - Presentation of training once in each state
 - Documentation of the results of the pilot states' experience with use of the guidelines
 - Development of software/forms that can be used to record test data

Status:

- The report and field test procedures have been posted on NCHRP Website.
- Virginia, Utah, and Alaska have tentatively agreed to be the participating states.
- Project team had teleconference, 3/19/08, to discuss the procedures to test. We agreed a less intrusive test procedure is needed before a lane is closed to run NCHRP test procedures. Dan called SRF (the developer of the test procedure) and determined that their research found only test 1 (of 5 procedures) has a feasible alternate test that is not traffic intrusive.
- None of the three states involved is willing to implement the test procedures as currently outlined.
- Project is currently stalled pending resolution of this dilemma.
- A project mini-meeting was held in Toronto in September 2008.

Approximate % Complete: 5 %

Barriers/Issues: None.

Recommendations: X continue as planned
 continue with modifications
 discontinue

Additional Comments:

- This project was funded for \$70,000.
- Project Team: Ralph Patterson (champion), Jack Stickel, Curt Pape, Bill Hoffman, Dawn Gustafson, Tina Greenfield, Bill Mahoney

Project Status Report

February 19, 2009

Project: 2006-03: Update of SHRP H-350 and H-351

Champion: Tina Greenfield, Iowa Department of Transportation

Purpose: The objective is to review H-350 and H-351 to determine which portions of the original report would benefit from a fifteen year update and complete a thorough benefit/cost analysis of RWIS technology.

Status:

- Research is being performed by Western Transportation Institute at Montana State University.
- WTI has drafted, sent, and received a survey to learn more about weather usage in winter maintenance as background for the cost benefit study. They have completed their survey analysis and most of the background information necessary for the benefit/cost modeling.
- WTI has begun inputting winter operations information from Iowa and Ontario into the b/c model.
- WTI is concluding surveys for winter maintenance employees at Iowa and Ontario to support the b/c model
- Nevada has recently agreed to be another case study agency and has begun looking up some winter information. WTI has started working on their survey.
- The research is expected to go into late 2008.
- WTI has also started working with Michigan DOT to obtain the necessary information for this project.

Approximate % Complete: 85 %

Barriers/Issues: None.

Recommendations: continue as planned
 continue with modifications
 discontinue

Additional Comments:

- This project was funded for \$50,000 in FY 2006 and \$100,000 in FY 2007.
- Project Team: Tina Greenfield (champion), Joe Doherty, Ralph Patterson

Project Status Report

August 28, 2008

Project: 2006-04: Evaluation of Vaisala Spectro Pavement Sensor

Champion: Mike Adams, Wisconsin Department of Transportation

Purpose: The objective is to study the accuracy and usefulness of the new Vaisala Spectro pavement temperature and condition sensor.

Status:

- The North Dakota unit was installed on 2/21/06. Full testing took place in winter 2006-07.
- The Ontario unit has been installed, and friction monitoring began 12/14/06.
- Ran into funding issues with UND - project amount was not enough.
- UND visited Ontario site on 3/14/07.
- UND: Collecting, archiving data since December 2006; minor software issue (flagged and deleted below zero air temperatures); two controlled experiments done, analysis underway. Most data has been collected, now doing experiments with Halladay Grip tester. Has prepared preliminary report that is being reviewed by project team. They had some issues with “spurious” data. Doing in-depth analysis to determine cause.
- Ontario: Site operational; have archived data from 6 winter storms. Analysis on hold due to Vaisala server problem. Plan to go for a second winter.
- Ontario sensor running all winter, will compare to Lufft RWIS and, hopefully, Haliday Grip Tester.
- Obtained 17 more friction data points this winter for comparison with the Vaisala traction estimate. Will also be comparing video images with the Vaisala surface conditions reports and temperatures with either Infra red thermometer data from patrol trucks or with a nearby LUFFT puck.
- Will receive final reports from UND and Ontario by August 31, 2008. Will review with team, then submit to board for approval.

Approximate % Complete: 95 %

Barriers/Issues: None.

Recommendations: continue as planned
 continue with modifications
 discontinue

Additional Comments:

- An additional \$10,000 was provided to this project under FY 2008.
- This project is funded for \$70,000 in Aurora funds.
- This project is also funded with \$25,000 in-kind from Ontario MOT.
- Project Team: Mike Adams (champion), Tina Greenfield, Curt Pape, Diana Clonch, Scott Roeder, Dan Eriksson, Ralph Patterson, Max Perchanok, Bill Mahoney

Project Status Report

September 25, 2008

Project: 2006-05: Technology Transfer (T²) of Alternative Inexpensive RWIS

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

Purpose: To research, through a proof of concept test, the ability to integrate pavement thermistors to existing highway infrastructure data collection sites. Potential sites include traffic (volume, classification, weigh-in-motion), signals (state and local government), and other environmental sites such as weather sites operated by other agencies. The project will document this new RWIS concept for pavement management and help develop urban sighting guidelines for the addition of pavement sensors to existing infrastructure.

Status:

- This project began in FY 2007 and will take approximately 2 years.
- The project examine using two dozen pavement thermistors (YSI -081-55033-NA-PF-480ST), interface board, and signal processing hardware from project 2001-04. Note (05/02/2008. These thermistors will not be used in the project and are available to other projects)
- A Concept of Operations, which will be used for putting together an RFP, will be completed in May 2008. The project will focus on these specific areas:
 - Install pavement thermistors at a State-maintained signalized intersection as part of a construction project in the Palmer/Wasilla small urban area
 - Install additional atmospheric and pavement sensors as part of automated traffic recorder sites and weigh-in-motion in Central Region
 - Establish inexpensive RWIS sites using Campbell datalogger type applications similar to the Petersburg cooperative site
- A project mini-meeting was held in Toronto in September 2008.

Approximate % Complete: 5 %

Barriers/Issues: None.

Recommendations: X continue as planned
 continue with modifications
 discontinue

Additional Comments:

- This project was funded for \$50,000 in FY 2006
- Project Team: Jack Stickel (champion), Tina Greenfield, Dawn Gustafson, Joe Doherty

Project Status Report

October 31, 2008

Project: 2006-08: Low Cost Mobile RWIS

Champion: Claude Lapointe, Quebec Ministry of Transportation

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:

- Equipment was purchased, and researchers worked on the software architecture in 2006.
- Construction of the prototype system has begun:
 - Open source operating system: linux
 - Support for the two know thermometer infrared for measuring the temperature of surface: RoadWatch, CPI Product 999J
 - Support for LCD display 4 x 20 with USB interface to mount on the dash of the vehicle
 - Support for USB GPS for model with ftdi and pl2303 usb to serial converter
 - Support for 1-wire interface sensor
 - Computer with compact flash
- For developing open source software we chose database embeded SQLite on linux, software OWFS for support of 1-wire sensors, gcc compiler, software gpsd daemon for reading on a TCP/IP socket the GPS data remotely, software LCDd daemon for managing LCD display on a TCP/IP socket remotely, software ncurses for managing display for configuration
- We have begun to develop software for the daemon of data acquisition:
- We are using software gpsd daemon for reading on a TCP/IP socket the GPS data remotely and software LCDd daemon for managing LCD display on a TCP/IP socket remotely.
- All the sensors will be consulting by a connection on the TCP/IP socket and the display on the USB LCD will be display by sending data also on a TCP/IP socket.

Approximate % Complete: 65 %

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 Belter, Dennis Burkheimer, Rudy Persaud

Project Status Report

August 21, 2008

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 will be held in Toronto in September 2008

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

February 19, 2009

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

Champion: Diana Clonch, 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 4th National Conference on Surface Transportation Weather in Indianapolis.
- A project mini-meeting was held in Toronto in September 2008.
- Jeff Tilley will try to send a final report to Scott Roeder prior to the Albuquerque meeting.

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 (champion), Mike Kisse, Dan Roosevelt, Max Perchanok, Tina Greenfield, Halliday Technologies

Project Status Report

September 25, 2008

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 to 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, but Tina Greenfield will confirm this.
- A project mini-meeting was held in Toronto in September 2008.
-

Approximate % Complete: 15 %

Barriers/Issues: None.

Recommendations: continue as planned
 X continue with modifications
 X 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

February 20, 2009

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

Champion: Max Perchanok, Ontario Ministry of Transportation

Status:

- The equipment has been purchased.
- Hardware and software have been transferred to UND.
- The software is installed on a computer at UND.
- The sensor is installed in a test location, along with a temperature sensor, on the roof of our building on the UND campus, in order to do some software testing.
- We have figured out a possible way to install it as a free standing sensor at our field facility (as NCAR would greatly prefer) but have been waiting for the ground to thaw enough so that we can auger a hole and secure a mounting pole. The colder than normal April we have had (with several light snowfalls) has pushed the thaw date back a bit so we are now looking at probably mid-May for this activity.
- Team needs to develop a more detailed work plan and schedule.
- A conference call will be scheduled soon.
- Delay in installation due to lightning protection.
- A project mini-meeting was held in Toronto in September 2008.
- A draft report has been received from UND.

Approximate % Complete: 30 %

Barriers/Issues: None.

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), Bill Mahoney, Jeff Tilley, Curt Pape, Mike Adams

Project Status Report

September 25, 2008

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

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

Objective: Integrate, through a proof-of-concept, non-obtrusive traffic data collection technology at Road Weather Information System (RWIS) sites in an arctic environment.

Status:

- Completed user interviews with ADOT&PF on traffic data collection needs. The ADOT&PF Technology Transfer is also looking at non-obtrusive traffic devices to be used in portable deployments. There is an opportunity to leverage these two projects.
- Selected the three regional RWIS sites in Fairbanks, Anchorage, and Juneau. The Fairbanks site will be upgraded from a pavement sensor only site to a full RWIS site in summer 2007.
 - The Fairbanks site was not installed and is unlikely to be done this year while the Department rebid their RWIS O&M contract.
 - The Glacier Highway/Egan Drive (14) in Juneau will be the southeast Alaska site.
 - Two areas will be used in the Anchorage area: (1) the Glenn Highway ITS Corridor from Anchorage to the intersection with the Parks Highway near Palmer, and (2) the proposed State of Alaska Safety Corridor on the Knik-Goose Bay Road south of Wasilla.
- This project will leverage the following other projects:
 - Glenn Highway Corridor ITS Implementation Plan
 - State of Alaska Safety Corridor
 - The Alaska DOT RWIS program
 - The Alaska DOT research project T2-07-09 “*Demonstration of Non-Intrusive Traffic Data Collection*”
 - AURORA project 2006-05 “*Technology Transfer (T²) of Alternative Inexpensive RWIS*”
- A concept of operations will be developed in May followed by a RFP draft scope of work.
- A project mini-meeting was held in Toronto in September 2008.

Approximate % Complete: <5 %

Barriers/Issues: Final scope of work for RFP

Recommendations: X 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

Project Status Report

September 25, 2008

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

Champion: Tina Greenfield, Iowa Department of Transportation

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.

Approximate % Complete: 15 %

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

February 20, 2009

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.

Approximate % Complete: 15 %

Barriers/Issues: None

Recommendations: X 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, Tom Maze

Project Status Report

September 24, 2008

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 will begin in FY 2008.
- This project was accepted as 3-year in-kind contribution by MTO.
- Preliminary discussions have been held with RWIS service providers in Ontario; AMEC and Pelmorex.
- MTO resources have been planned, and a technical review is underway.

Approximate % Complete: <5 %

Barriers/Issues: None

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

Project Status Report

October 29, 2008

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

Champion: Ralph Patterson, Utah Department of Transportation

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.

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

February 18, 2009

Project: 2009-02: Road Weather Information Outreach / Second Peer Exchange

Champion: Tina Greenfield, Iowa Department of Transportation

Objective: The purpose of this funding is to conduct a National winter maintenance meeting for Aurora, Clear Roads, SICOP, PNS and the FHWA to share research results from the Peer Exchange held in 2007, get updates from each snow-belt state and discuss other issues related to winter snow removal operations. Each state would send two representatives to the meeting that are most actively involved with the areas covered by Aurora, Clear Roads, PNS, SICOP and FHWA efforts.

Status:

- This project will begin in FY 2009.
- The 2009 event will be held in Madison, Wisconsin.
- Detailed arrangements are being discussed.

Approximate % Complete: 10 %

Barriers/Issues: None

Recommendations: continue as planned
 continue with modifications
 discontinue

Additional Comments:

- This project was funded for \$30,000 in FY 2009
- Project Team: Tina Greenfield (champion), Bill Hoffman, Mike Kisse, Dean Kernan

Project Status Report

October 31, 2008

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:

- This project will begin in FY 2009.
- 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.

Approximate % Complete: <5 %

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, Curt Pape, Jeff Tilley

Project Status Report

October 31, 2008

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:

- This project will begin in FY 2009.

Approximate % Complete: <5 %

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

Project Status Report

February 20, 2009

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

Champion: Ralph Patterson, Utah 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:

- This project will begin in FY 2009.
- The process of writing up the contract for professional services is underway.

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

October 31, 2008

Project: 2009-06: Salinity Sensor Improvements and Development

Champion: Tina Greenfield, Iowa Department of Transportation

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 will begin in FY 2009.

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

October 31, 2008

Project: 2009-07: Review of Friction Detection Technologies

Champion: Max Perchanok, Ontario Ministry of Transportation

Objective: The objective of this project is to review the state-of-the-art in friction detection.

Status:

- This project will begin in FY 2009.

Approximate % Complete: <5 %

Barriers/Issues: None

Recommendations: X continue as planned
 continue with modifications
 discontinue

Additional Comments:

- This project was funded for \$35,000 in FY 2009
- Project Team: Max Perchanok (champion), Dawn Gustafson, Bill Hoffman, Joe Doherty, Jeff Tilley, Bill Mahoney