Aurora Program

Aurora Board Meeting September 29-30, 2009 – Des Moines, Iowa, USA

Individuals Participating:

Bill Hoffman, Nevada DOT Jack Stickel, Alaska DOT&PF Tina Greenfield, Iowa DOT Dean Kernan. Illinois DOT Curt Pape, Minnesota DOT Dawn Gustafson, Michigan DOT Max Perchanok, Ontario MOT Brad Darr. North Dakota DOT Mike Adams, Wisconsin DOT Kirk Carpenter, Indiana DOT Lee Smithson, AASHTO Sheldon Drobot, NCAR Jeff Tilley, University of North Dakota Chris Albrecht, Iowa State University - InTrans Jennifer Serra, Iowa State University – InTrans Dennis Burkheimer, Iowa DOT (Wednesday only) Nick Burdine, Iowa State University – InTrans (Wednesday only)

I. Open and General Items

Introductions and Approval of Agenda – Ralph Patterson welcomed the attendees, then asked the board 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 then reviewed draft minutes from four past board meetings covering February 2009 through August 2009. After a lengthy review, the board approved the minutes with only minor changes.

II. Aurora Survey

Jen Serra briefly reviewed some of the survey questions, but the board decided to discuss this topic in more detail at a later date.

III. Project Updates

Designated project champions then reviewed the status of ongoing Aurora research. Chris Albrecht provided the board with a summary of 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 the status of this project, noting that administrative problems at MTO continued to delay the project.

Project 2000-05 – RWIS Leverage Opportunities: Lee Smithson had nothing new to report, but Chris Albrecht noted that the funding available under this project was \$31,000.

Project 2003-04 – **Intelligent Image-Based Winter Road Condition Sensor - Phase III:** Chris Albrecht noted that this project was essentially complete, but needed a final summary from Dan Eriksson.

Project 2004-04 – Winter Weather Severity Index Enhancements: Tina Greenfield reviewed the latest news concerning this effort, noting the problems they had been having with the contractor and guidelines for the index. A lengthy discussion followed, wherein it was noted that the project was near completion from the board's perspective.

Project 2005-01 – **Development of a RWIS Quality Assurance Monitoring System:** Jack Stickel reviewed this project, noting that the team had met earlier during the mini-meeting session and had discussed sending a package to the board regarding the COMET work. Jack also noted that a detailed scope of work for the project was still needed. The group then discussed whether a single RFP would be sufficient to cover this work and Project 2007-01. It was concluded that the two efforts could ultimately be packaged together.

Project 2005-02 – **RWIS Telecommunications Issues and Options:** Chris Albrecht reviewed project progress, noting that the project was about nearly complete, with a few follow-up calls to agencies needed.

Project 2005-06 – New Road Surface Condition Sensor: Nothing new was reported for this effort.

Project 2006-01 – **Support of the** *Clarus* **Initiative:** Tina Greenfield reviewed the project, noting that the official award from the ConOps was to be announced in October. Until then, Tina noted, she would like to keep the project open so the board could review progress. Sheldon Drobot was also added to the project team.

IV. Project Updates (continued)

Project 2006-04 – **Evaluation of Vaisala Spectro Pavement Sensor:** Mike Adams and Jeff Tilley reviewed the project progress to date, noting it was nearly complete. Jeff noted that the final UND report should be available soon, so the board could vote on completion at the next meeting.

Project 2006-05 – **Technology Transfer of Alternative Inexpensive RWIS:** Jack Stickel reported on this project, noting that it was discussed in detail during the mini-meeting session. A long discussion followed, wherein it was decided to consider combining this effort with Aurora Project 2007-05.

Project 2006-08 – Low Cost Mobile RWIS: Nothing new was reported for this effort.

Project 2007-01 – RWIS Equipment Monitoring System – Phase II: Jack Stickel reviewed this effort, noting he was looking into how to combine it with Project 2005-01.

Project 2007-02 – Cold Weather Testing of the Halliday Road Grip Unit: Jeff Tilley noted that he final report was all that was needed to complete the project.

Project 2007-03 – **Incorporation of MDSS into Winter Weather Forecasting - Phase I:** Tina Greenfield noted that this project has seen revived activity and interest recently. A discussion followed, wherein the group agreed input was needed from Ralph Patterson.

Project 2007-04 – **Development and Demonstration of a Freezing Drizzle Algorithm for ESS:** Max Perchanok and Jeff Tilley discussed this project, noting that three reporting benchmark dates had been set during the mini-meeting session, with an extension of the completion date to June 30, 2010.

Project 2007-05 – **Multiple-Use ITS Data Collection Sites:** Nothing new was reported for this effort.

Project 2008-01 – Development of a National Road Weather Testing Facility: Nothing new was reported for this effort.

Project 2008-02 – **Evaluation of Utah DOT's Weather Operations/RWIS Program:** Chris Albrecht noted that a mini-meeting was held, wherein the team decided to wait on the final comments that WTI was working on and have Ralph update the board on the final report at a future meeting.

Project 2008-03 – Next Generation RWIS for Canada: Max Perchanok noted that this project was progressing steadily.

Project 2009-01 – Evaluation and Inter-comparison of the Lufft R2S Sensor: Nothing new was reported for this effort.

Project 2009-02 – Second Peer Exchange: Lee Smithson noted that the event in Madison was very successful, with over 30 states attending.

Project 2009-03 – **Knowledge Base for RWIS and Environmental Data Loggers:** Nick Burdine from ISU-InTrans briefly reviewed a website he had developed for the Concrete Consortium. A lengthy discussion followed concerning how a similar site could be created for Aurora. Ultimately, the board asked Chris Albrecht to put together a scope for InTrans staff to develop the site. In addition, Bill Hoffman was added to the project team.

Project 2009-04 – **Road Weather Education Enhancements and Dissemination:** Chris Albrecht and Dawn Gustafson noted that little progress had been made recently, but that the focus of the project would be identifying and filling gaps in educational materials.

Project 2009-05 – Further Development of Pavement Precipitation Accumulation Estimation: Nothing new was reported for this effort.

Project 2009-06 – Salinity Sensor Improvements and Development: Tina Greenfield reported that she and the project team had a difficult time defining the scope of this effort, but would continue to do so.

Project 2009-07 – **Review of Friction Detection Technologies:** Max noted that the project team was waiting for a review of a similar European study to be completed before they began the project.

V. Ongoing Project Follow-Up Review

The board spent time after the meeting broke for the evening discussing project progress in small groups.

VI. Ongoing Project Follow-Up Session

The board spent time reviewing project progress from the previous session, noting that six projects would require significant follow-up by Chris and each team. These projects were Projects 2000-01, 2007-02, 2008-01, 2009-03, 2009-04, and 2009-07.

VII. Program Administration and Financial Status

Chris Albrecht reviewed a spreadsheet detailing the program financials. The board discussed a few outstanding membership payments, <u>which Chris would follow-up on as soon as possible</u>.

VIII. 2009-2010 Work Plan

Chris Albrecht then reviewed the timeline for updating the work plan, noting that all sections had been updated as much as possible, with the new FY2010 projects still to be defined. Tina Greenfield then reviewed the 13 problem statements that resulted from the peer exchange and were assigned to Aurora in detail. A lengthy discussion followed concerning these ideas. Chris Albrecht also reviewed the project ideas submitted by Aurora members over the past several months.

IX. 2009-2010 Work Plan (continued)

Chris Albrecht continued the discussion by asking each of the submitters of proposed projects to provide a brief summary of the project idea. After a lengthy review of the proposals, preliminary champions and teams were assigned to each. As a result, nearly 20 proposed projects for FY2010 were discussed and refined.

X. 2009-2010 Work Plan (continued)

Next, the board decided that Chris Albrecht would work with each project team to refine the ideas prior to the board decision on funding. The voting would take place sometime in October, it was decided.

XI. National Initiatives and Partnerships

AMS – Sheldon Drobot noted that he would be attending the 2010 annual meeting and would keep the board abreast of any news.

NTCIP – Curt Pape noted that the process was winding down, with TMDP 3.0 close to being finished.

XII. Member Agency Updates

Next, each agency in attendance gave a very brief review of their recent winter maintenance and road weather-related activities. The reviews are briefly described in the following section. A handout of the reports provided by members prior to the meeting is attached to these minutes as Attachment B.

Iowa Department of Transportation – Tina Greenfield reported that Iowa was working on a new forecast contract. She also noted that they would be updating the Weatherview site and utilizing portable RWIS in the coming months.

Minnesota Department of Transportation – Curt Pape reported that Mn/DOT was utilizing several new Lufft sensors and would be reporting to Aurora on their experience with them. He also discussed problems with the AVL contract in Minnesota, which spurred a lengthy discussion.

Illinois Department of Transportation – Dean Kernan reported that Illinois was planning to upgrade several sites in the coming year. He also discussed a meeting of the IDOT Statewide Snow and Ice Committee and other recent activities.

Indiana Department of Transportation – Kirk Carpenter discussed INDOT's experience with utilizing MDSS, noting cost savings have been estimated at approximately \$10 million.

XII. Member Agency Updates (continued)

New York State Department of Transportation – Joe Doherty noted several recent developments at NYSDOT, including working on an MDSS with Meridian and Lufft.

Ontario Ministry of Transportation – Max Perchanok noted that Ontario now has a new RWIS contract and that they are using flood gauges at RWIS sites.

Wisconsin Department of Transportation – Mike Adams noted that Wisconsin now has one county fully utilizing MDSS, with expansion to the rest of the state very likely.

North Dakota Department of Transportation – Brad Darr discussed 511 and NDDOT's experience with it. He also noted that NDDOT was joining both Clear Roads and North West Passage groups.

Michigan Department of Transportation – Dawn Gustafson noted that MDOT was putting in 12 new RWIS sites. A discussion also followed concerning frost depth tubes and each agency's experience with them.

XIV. Aurora Communications

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

XV. Future Aurora Meetings and Calls

After a short discussion, board web meetings were scheduled for October 26, 2009 at 1:00 p.m. (CDT), December 3, 2009 @ 1:00 p.m. (CST), and February 18, 2010 at t 1:00 p.m. (CST).

The board agreed that the next board meeting would likely take place in Minneapolis in mid-April. Chris noted that he would check into options in the Twin Cities.

XVI. Other Items

Nothing further was discussed.

Agenda

Aurora Program Board Meeting

September 29-30, 2009 Embassy Suites, Des Moines, Iowa, USA

AGENDA

Tuesday, September 29, 2009:

	8:00	Project Mini-Meetings	
	8:00	Projects 2006-05 and 2007-05 Jack S	Stickel and Teams
		Teams include: Greenfield, Gustafson, Pape, and Pattersor	1
	9:00	Projects 2005-01 and 2007-01 Jack S	Stickel and Teams
		Teams include: Adams, Greenfield, Gustafson, Pape, and Po	atterson
	10:00	Break	
	10:15	Project Mini-Meetings (continued)	
	10:15	Project 2007-04 Max Per	chanok and Team
		Team includes: Adams, Mahoney/Drobot, Pape, and Tilley	
	10:40	Project 2009-07 Max Per	chanok and Team
		Team includes: Gustafson, Hoffman, Mahoney/Drobot, and	d Tilley
	11:05	Project 2008-02 Ralph Pa	tterson and Team
		Team includes: Adams, Greenfield and Gustafson	
	11:35	Project 2009-05 Ralph Pa	tterson and Team
		Team includes: Hoffman, Kernan, and Stickel	
	12:00	Break for Lunch	
I.	1:00	Open and General Items	
	1:00	Introductions and review/approval of agenda	Ralph Patterson
	1:10	Review of previous minutes and actions	Chris Albrecht
II.	1:15	Aurora Surveys Discussion	Bill Hoffman
III.	2:15	Project Updates	
	2:15	2000-01 - Benchmarking RWIS Forecasts	Max Perchanok
	2:20	2000-05 - RWIS Leveraging Opportunities	Lee Smithson
	2:25	2003-04 – Intelligent Image-Based – Phase III	Chris Albrecht
	2:30	2004-04 – Weather Index Enhancements	Tina Greenfield
	2:35	2005-01 - RWIS Quality Assurance Monitoring System	Jack Stickel
	2:40	2005-02 - RWIS Telecommunications Issues	Dean Kernan
	2:45	2005-06 - New Road Surface Condition Sensor	Chris Albrecht
	2:50	2006-01 - Support of the Clarus Initiative	Tina Greenfield
	2:55	Break	

IV.	3:10	Project Updates (continued)	
	3:10	2006-04 - Evaluation of Vaisala Spectro Sensor	Mike Adams
	3:15	2006-05 - T ² of Alternative Inexpensive RWIS	Jack Stickel
	3:20	2006-08 - Low Cost Mobile RWIS	Chris Albrecht
	3:25	2007-01 - RWIS Equipment Monitoring II	Jack Stickel
	3:30	2007-02 - Cold Weather Testing of Halliday Unit	Chris Albrecht
	3:35	2007-03 - Incorporation of MDSS - Phase I	Tina Greenfield
	3:40	2007-04 - Freezing Drizzle Algorithm	Max Perchanok
	3:45	2007-05 - Multiple Use ITS Sites	Jack Stickel
	3:50	2008-01 - National Testing Facility	Tina Greenfield
	3:55	2008-02 - Evaluation of Utah TOC Weather Ops	Ralph Patterson
	4:00	2008-03 - MDSS Demo in Ontario	Max Perchanok
	4:05	2009-01 - Evaluation of the Lufft R2S	Ralph Patterson
	4:10	2009-02 - Second Peer Exchange	Tina Greenfield
	4:15	2009-03 - Knowledge Base for RWIS and Loggers	Jack Stickel
	4:20	2009-04 - Road Weather Education Enhancements	Dawn Gustafson
	4:25	2009-05 - Further Development of PPAES	Ralph Patterson
	4:30	2009-06 - Salinity Sensor Improvements and Development	Tina Greenfield
	4:35	2009-07 - Review of Friction Detection Technologies	Max Perchanok
	4:40	Break	
V.	4:55	Ongoing Project Follow-Up Review	Chris Albrecht
	5:15	Adjourn	

6:30 Group Dinner

Wednesday, September 30, 2009:

VI.	8:00	Ongoing Project Follow-Up Session Chris Albrecht		
VII.	9:20 9:20 9:30 9:25	Program Administration and Financial Status Discussion of membership payments, contributions, and agreements Discussion of program expenditures and contracting issues Discussion of management contract		
	9:45	Break		
VIII.	10:00 10:00 10:10 10:20	2009-2010 Work PlanChris AlbredDiscussion of plan schedule and milestonesDiscussion of plan sections under reviewReview of available budget for FY 2010Chris Albred		
IX.	10:30 10:30 11:00	0:302009-2010 Work Plan (continued)Al0:30Review and discussion of developed candidate projects for FY 20101:00Discussion of 2009 Peer Exchange problem statements		
	12:00	Break for Lunch		
Χ.	1:00 1:00 1:10	2009-2010 Work Plan (continued)AllFurther discussion of 2009 Peer Exchange and other candidatesReview of revised candidate project list for FY 2010		
XI.	1:20 ENTERF TRB Tas AASHT Other I	National Initiatives and Partnerships (5 minutes each)RPRISE, MDSS, NTCIPCurt Papeask Forces and Committees, ITS America, AMSSheldon DrobotTO/SICOP, Clear Roads, PNS, SIRWECChris AlbrechtInitiatives/GroupsAll		
XII.	2:00	Round Robin/Member Agency RWIS Updates	All Participants	
	2:45	Break		
XIII.	3:00	Round Robin/Member Agency RWIS Updates (continued)	All Participants	
XIV.	3:45	Aurora Communications	Chris Albrecht	
XV.	4:15	Future Meetings and Calls Ralph Patterson		
XVI.	4:30	Other Items	All	
	4:45 /	Adjourn		

Attachment A

Aurora Program Ongoing Project Status

September 28, 2009

FY 2000 through FY 2004

- <u>2000-01: Benchmarking the Performance of RWIS Forecasts</u> = 45% complete
- <u>2000-05: RWIS Leverage Opportunities</u> = \$31,000 in funding available
- 2003-04: Intelligent Image-Based Winter Road Condition Sensor Phase III = >95% complete
- <u>2004-04: Weather Index Enhancements</u> = 90% complete

FY 2005

- <u>2005-01: Development of an RWIS Quality Assurance Monitoring System</u> = 5% complete
- <u>2005-02: RWIS Telecommunications Issues and Options</u> = 85% complete
- <u>2005-06: New Road Surface Condition Sensor</u> = >95% complete

FY 2006

- <u>2006-01: Support of the Clarus Initiative</u> = 55% complete
- <u>2006-04: Evaluation of Vaisala Spectro Pavement Sensor</u> = 99% complete
- <u>2006-05: Technology Transfer of Alternative Inexpensive RWIS</u> = <5% complete
- <u>2006-08: Low Cost Mobile RWIS</u> = 65% complete

FY 2007

- <u>2007-01: RWIS Equipment Monitoring System Phase II</u> = <5% complete
- <u>2007-02: Cold Weather Testing of the Halliday Road Grip Unit</u> = 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 = 40% complete
- 2007-05: Multiple-Use ITS Data Collection Sites = <5% complete

FY 2008

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

FY 2009

- <u>2009-01: Evaluation and Inter-comparison of the Lufft R2S Sensor</u> = <5% complete
- <u>2009-02: Road Weather Information Outreach / Second Peer Exchange</u> =99% complete
- <u>2009-03: Knowledge Base for RWIS and Environmental Data Loggers</u> = <5% complete
- <u>2009-04: Road Weather Education Enhancements and Dissemination</u> = <5% complete
- <u>2009-05: Further Development of PPAES</u> = 5% complete
- <u>2009-06: Salinity Sensor Improvements and Development</u> = <5% complete
- <u>2009-07: Review of Friction Detection Technologies</u> = <5% complete

September 28, 2009

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.
- Funds are available for a contract this year.
- An RFP is ready.
- A staff technician has begun to reconnect with those who had responded to the survey.
- The team will assemble a data base of observations as well as research and propose forecast parameters.
- The next step will be to discuss the proposed parameters with contributing agencies and stakeholders.
- Considering whether or not additional data will need to be gathered this next winter.

Approximate % Complete: 45 %

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

Recommendations: _____ continue as planned X continue with modifications discontinue

- 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

September 28, 2009

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.
- 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 partnering, such as those resulting from the Second National Winter Maintenance Peer Exchange, are being investigated.

Barriers/Issues: None.

Recommendations: <u>X</u> continue as planned ______ continue with modifications ______ discontinue

- \$31,000 is available.
- Project Team: Lee Smithson (champion), Dean Kernan, Scott Roeder
- An additional member agency project team member is needed.

September 28, 2009

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.
- The team was still waiting for a report detailing the research results.

Approximate % Complete: <u>>95</u> %

Recommendations: _____ continue as planned _____ continue with modifications

X discontinue

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

September 28, 2009

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. AccuWeather was selected.
- 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.

Approximate % Complete: <u>90</u> %

Barriers/Issues: None.

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

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

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: <u>http://www.clarus.mixonhill.com/observations/contributor.jsp</u> to tailor this project to the anticipated Clarus System output.
- The Clarus System web interface is now available at <u>http://www.clarus-system.com/</u>
- 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: <u>5</u>%

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

Recommendations: X continue as planned continue with modifications discontinue

- 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

September 28, 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 Gieseman 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.

Approximate % Complete: <u>85</u>%

Recommendations: <u>X</u> continue as planned

_____ continue with modifications

_____ discontinue

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

August 5, 2009

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.
- <u>http://www.rwis.net/gmcgui</u> 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. ٠

Approximate % Complete: >95 %

Barriers/Issues: None

Recommendations: X continue as planned _____ continue with modifications discontinue

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

September 28, 2009

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.
- Aurora agreed to fund other Aurora states participation in other ConOps projects.
- The study report for all three ConOps teams are at <u>http://www.clarusinitiative.org/regional.htm</u>.
- A project account was being set up to cover Clarus travel.

Approximate % Complete: <u>55</u>%

Barriers/Issues: None.

Recommendations: <u>X</u> continue as planned

_____ continue with modifications

discontinue

- 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

September 28, 2009

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 Haliday Grip Tester hopefully.
- 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.
- The report will be provided to Vaisala for review.
- The group is waiting on UND's response to comments then they will go final.

Approximate % Complete: <u>99</u>%

Barriers/Issues: None.

Recommendations:	<u>X</u> continue as planned
	continue with modifications
	discontinue

- 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

September 28, 2009

Project: <u>2006-05: Technology Transfer (T²) of Alternative Inexpensive RWIS</u>

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)
- The project initially looked at 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)
- The project then looked at the new generation traffic signal controllers to determine if pavement temperatures could be incorporated into the cabinets none were found.
- The most recent thinking is to look at other types of sensors to integrate into Campbell dataloggers or other existing remote processing units.

Approximate % Complete: <u><5</u> %

Barriers/Issues: None.

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

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

August 5, 2009

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 neurse 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: <u>65</u>%

Barriers/Issues: None.

Recommendations: X continue as planned continue with modifications discontinue

- 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

September 28, 2009

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

Approximate % Complete: <u><5</u>%

Barriers/Issues: Final Scope of Work for RFP

Recommendations:	Χ	continue as planned
		continue with modifications
		discontinue

- 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

September 28, 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 4th 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.

Approximate % Complete: <u>90</u> %

Barriers/Issues: None.

Recommendations: X continue as planned continue with modifications discontinue

- 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

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 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.
- 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: <u>15</u>%

Barriers/Issues: None.

Recommendations:		continue as planned
	Χ	continue with modifications
	Χ	discontinue

- 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

September 28, 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.
- Additional data collection would begin in September 2009 when the sensor is redeployed.
- UND was currently working on analysis of existing data and plans to work on analysis of 2009 fall data somewhat concurrently.

Approximate % Complete: 40 %

Barriers/Issues: UND has had little communication with NCAR on this project during the summer months.

Recommendations:		continue as planned
	Χ	continue with modifications
		discontinue

- 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

September 28, 2009

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

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

Objective: Maximize the available RWIS site power and communication for other environmental data and traffic data collection. There may be multiple solutions for each area, depending on each state's IT and contractual requirements. To use RWIS sites for multiple data collection rodeploy non-intrusive traffic data collection technology at Road Weather Information System (RWIS) sites.

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 AUurora project 2009-03 "*Knowledge Base for RWIS Programs and Environmental Data Loggers*".
- 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 Dixoide CO2
 - 6) Sulpher 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: <u><5</u>%

Barriers/Issues: Final scope of work for RFP

Recommendations: X continue as planned continue with modifications discontinue

- 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

September 28, 2009

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

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.
- 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: <u>20</u> %

Barriers/Issues: None

Recommendations: <u>X</u> continue as planned <u>continue</u> with modifications discontinue

- 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

September 28, 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.
- 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: <u>95</u>%

Barriers/Issues: None

Recommendations: X continue as planned continue with modifications discontinue

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

September 28, 2009

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.
- RWIS business case for Ontario underway.
- Implementation of Seasonal Load Adjustment underway
 - 7 monitoring sites to be linked to RWIS network fall '09
 - Comparison of 3 frost depth models in progress, to be complete in '09
 - Interim frost depth forecast models to be implemented spring '10
 - Early progress in relating thaw depth to pavement strength (modulus)
- Research underway to develop Night Icing Potential maps for 2 sites with implementation and testing in 2010-11. Thermal mapping/fingerprinting this winter.
- Consider teaming up with Michigan who is adding frost depth measurements to their 12 new stations.

Approximate % Complete: <u>30</u> %

Barriers/Issues: None

Recommendations: X continue as planned continue with modifications discontinue

- 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

September 28, 2009

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.
- 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: <u><5</u>%

Barriers/Issues: None

Recommendations: X continue as planned continue with modifications discontinue

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

September 28, 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 was held in Madison, Wisconsin.
- Snow and ice control experts from 30 state DOT's, District of Columbia DOT, Federal Highway Administration, American Association of State Highway and Transportation Officials, Transportation Research Board, CTC and Associates, and Iowa State University attended the 2009 Peer Exchange.
- A total of 27 new research needs statements were identified and are being considered for inclusion in future work programs of the national research groups. Progress on the 2007 and 2009 research needs statements will be posted on the SICOP website.
- A final report is being drafted, and projects are being assigned to the research groups.

Approximate % Complete: <u>99</u>%

Barriers/Issues: None

Recommendations: X continue as planned continue with modifications discontinue

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

September 25, 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.

Approximate % Complete: <u><5</u>%

Barriers/Issues: None

Recommendations:	Χ	continue as planned
		continue with modifications
		discontinue

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

September 28, 2009

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.
- 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.
- CTRE planned to assist the project team in drafting a project scope.
- The group will review the scope sent by CTRE at the Des Moines meeting.

Approximate % Complete: <u><5</u>%

Barriers/Issues: None

Recommendations: X continue as planned continue with modifications discontinue

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

September 28, 2009

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

Champion: <u>Ralph Patterson</u>, 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.
- The contract was sent back to the Iowa DOT for review after additional changes from UND.
- The project is getting underway.

Approximate % Complete: <u>5</u>%

Barriers/Issues: None

Recommendations: X continue as planned ______ continue with modifications discontinue

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

September 28, 2009

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 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: <u><5</u>%

Barriers/Issues: None

Recommendations: X continue as planned continue with modifications discontinue

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

February 27, 2009

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.
- The TAC study and European study would be used for reference, therefore the group decided to delay until the European study was complete later in 2009.
- A list of recent reports has been assembled including Aurora, TAC, Europe.

Approximate % Complete: <u><5</u>%

Barriers/Issues: None

Recommendations: X continue as planned continue with modifications discontinue

- 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

Attachment B

Aurora Program

Member Agency Updates

Alaska Department of Transportation and Public Facilities:

Jack Stickel

- National Rural Intelligent Transportation System (NRITS) Conference presentation: Rural Communication Solutions for Road Weather Information Systems.
- Notes: _____

Illinois Department of Transportation

Dean Kernan

- The Illinois DOT Statewide Snow and Ice Committee met in August. They discussed participation in the *511 that has been put out for RFP. No news has been received.
- Also from the S&I Committee, we have contacted SSI to get an idea of what we need in order to upgrade our RWIS system into the 20th century. A bid was received to replace the district servers with one central server in Springfield at a cost of @\$38,000. (includes server, software, set-up, etc.) The second phase of upgrading each site is estimated at \$900,000.

- Illinois is still looking into holding a Snow Plow Rodeo/Snowfighter Workshop in Fall 2008.
- The S&I Committee is checking into adding some features to our statewide contract for weather forecasting. Work on that RFP will begin in January. RFP's have been collected from other Aurora member states. The Snow & Ice Weather/RWIS Committee is pouring over them and tweaking them to meet their needs.
- Since SSI weather forecasting has been purchased by DTN, Illinois will be receiving their daily weather forecasts (including RWIS information) and weather warnings via Weather Sentry.
- Notes:

Indiana Department of Transportation

Dennis Belter / Kirk Carpenter

- INDOT is processing a new Weather Service Contract. It was submitted as a sole source to award to Meridian. In addition to our standard winter requirements, it includes limited MDSS and forecasting through the summer for maintenance, traffic, and construction use. Severe weather warnings will be provided in the summer also.
- A Joint Transportation Research Project (JTRP) proposal was approved recently to develop performance measurements for snow and ice removal activities using existing traffic count sites with added road sensors. Purdue will perform the research.
- The Super Bowl win celebration included a car flipping over a guardrail and wiping out a new RWIS at Bloomington IN. We're sure the case of Coors Light in the back had nothing to do with the accident.
- Notes: _____

Iowa Department of Transportation

Tina Greenfield

- Iowa will be beginning the third year of our 3-year contract with Meridian for forecasting services. We are in the process of forming a new contract for satellite weather delivery systems for employees without internet permissions. DTN has been our provider for this service for the last several years.
- This year we signed a new maintenance contract with SSI for our RWIS stations. The contract is much the same as previous contracts, except for standard pricing on new installs and sensor cut repairs.
- RFPs and bids have been sent for RWIS precipitation sensors, road cameras, and radar traffic speed sensors. Bidders will be evaluated in the next few weeks.
- The Weatherview website for RWIS and AWOS to be updated after some state IP procurement stuff is worked out. The Federal ITS funds that would support this project have been granted.
- Notes: _____

Minnesota Department of Transportation

Curt Pape

• Notes: _____

New York State Department of Transportation

Joe Doherty

- We are continuing with our NYSTEC consultant contract to eventually develop an RWIS RFP. However, after reviewing responses from peer states & a province, we will be going first with an RFI to obtain additional information from the vendor community. There is also a strong possibility that a contract will be developed to get help with RWIS site selection in advance of a design/build/O&M RFP.
- We have joined the MDSS Pooled Fund Study for the 2007-08 winter.
- We operated a Boschung FAST on part of a newly constructed I-86 interchange this past winter. After fine-tuning some of the zone controls, the system appears to be working as expected.
- We shall expand the piloting of AVL technology to a second region of the state in conjunction with our MDSS program. AmeriTrak will again be the vendor.
- We shall be running a limited number of ESS sensor tests this coming winter. We shall be using an independent lab and analytical firm to assist with determining accuracies and reliabilities.

• Notes: _____

North Dakota Department of Transportation

Mike Kisse (no change since December 2006)

- NDDOT continues to participate in the pooled fund MDSS development project.
- NDDOT also continues to develop an AVL program to feed MDSS. We currently have 18 trucks in 3 separate locations collecting data. Our AVL, RWIS and camera information is being displayed in MDSS.
- Notes: _____

Ohio Department of Transportation

Diana Clonch

- Continuing work with the RGT both in-house and with Dr. Tilley at UND.
- Participating in the Clear Roads ground speed controller project.
- Continue to participate in Clarus Initiative and currently completing a detailed inventory of all RWIS sites
- Conducting research with Wright State University regarding salt storage and ordering processes.
- Recently let contracts for weather forecasting services and RWIS maintenance and repair (2nd year with potential for multiple year award). Awarded to Meridian for forecasting and to a local vendor for RWIS maintenance.
- Outreach with local governments for partnering of RWIS upgrades and information sharing.
- Preparing to host the 12th Eastern Snow Symposium and National Peer Exchange in August 2007.
- Investigating GPS/AVL and preparing specifications.
- Notes: _____

Ontario Ministry of Transportation

Max Perchanok

- Instrumentation has been procured from Zydax and Campbell Scientific to increase the subsurface frost-monitoring network from 2 to 6 locations, and to link the sites with MTO's RWIS web site. The network will be operational by fall 2007.
- DLA (anti-icing) guidelines were revised in February to both widen the temperature range in which liquids can be used and to further limit the risk of slipperiness in warm conditions. No slippery incidents occurred this year.
- Maintenance Technology Project report for winter 2004-05-06 and partial results for 2006-07 will be on the web by mid May.
- MTO is sponsoring a university project to investigate explicit relationships between traffic flow, accident rate, and winter maintenance service standards.
- No expansion of RWIS network or FAST is planned for this year. RWIS is working well, and bugs are being worked out with FAST before expansion is considered.
- Notes: _____

Pennsylvania Department of Transportation

Dave Hughes

- PennDOT is currently in the first year of a new maintenance and repair contract with Nu-Metrics. New contract is based on time and materials with one paid preventive maintenance visit per site each year. Contract term is one year with four one year renewals.
- PennDOT is in a re-building phase with our Nu-Metrics(46) and SSI(24) sites.
- Research is underway to determine the future of RWIS at PennDOT. The consultant will review RWIS equipment, communication issues, site placement, current technologies, and operational data usage.
- Contract weather forecasting services are being explored to find how PennDOT can benefit from using a single source to provide State, District, and County specific forecasts.

• Notes: _____

Quebec Ministry of Transportation

Claude Lapointe (no change since December 2006)

- Quebec would like to continue in Aurora as an in-kind contributor.
- An MOU has been sent to Quebec MOT after being approved by the Aurora board.
- Notes: _____

Swedish Road Administration

Dan Eriksson (no change since December 2006)

- Sweden is currently involved in an ongoing project where they use a combination of salt and sugar for anti-icing.
- Notes: _____

Tennessee Department of Transportation

Joe Holt (no change since December 2006)

- Vaisala was awarded the maintenance contract for TDOT's SSI sites.
- The 12 year old fog detection and warning system on I-75 was rebuilt in 2006. The equipment has deteriorated and the software was running on OS2. It will be connected to the TMC in Chattanooga for monitoring.
- Notes: _____

Utah Department of Transportation

Ralph Patterson (no change since December 2006)

- Development in progress, of a public RWIS-ESS page through the University of Utah
- Western Transportation Institute (WTI) presented the draft report to UDOT leaders on Phase 1: Evaluation of Utah DOT's Weather Operations/RWIS Program
- Utilizing the Weather Operations Group to provide 511 alerts, VMS messages and HAR recordings on storm days.
- Successful joint venture with the SLC office of the National Weather Service and UDOT, in deployment of several RWIS/ESS in remote areas of Utah
- Rebuilt 5 RWIS sites using 700mhz com along I-70
- Decommissioned two RWIS sites along the Wasatch Front this fall
- New forecast and RWIS page for UDOT personnel, at: <u>http://www.nw-</u> weathernet.com/udot/maintenance/udot_maintenance_map.html
- Notes: _____

Virginia Department of Transportation

Dan Roosevelt

- 511 has been expanded to statewide coverage.
- VDOT maintains 40 ESS sites that are accessible to all employees through an internal network. This data is accessible to approved outsiders through an ftp site. The data is used by our 511 contractor to develop weather related warnings, but is not shared with the public.
- The Staunton District (Shenandoah Valley) System Operations Team maintains eight ESS sites, but access to them is tightly controlled. The sites integrate traffic, road temperature, and camera images into a single report. Data is collected every four hours, but special updates can be requested. Traffic and weather data is archived; images are not.
- VDOT maintains numerous real-time cameras along the interstate system in the three large urban areas of the state (Northern Virginia, Hampton Roads, and Richmond), as well as in more rural areas such as I-81 in the Shenandoah Valley and near Bristol.
- VDOT is in the third year of a three year contract with Vaisala to maintain the 40 ESS and reporting system.
- The use of pre-wetted granular salt is the predominant chemical used in Virginia. True antiicing (i.e., direct liquid application to the pavement) occurs in only two of the 44 residencies in the state.
- Virginia DOT has joined the Pooled-fund MDSS project and plans to develop route specific forecasts and treatment options for some routes in the two districts west of Roanoke
- Notes: _____

Wisconsin Department of Transportation

Mike Adams

- Working with STOC on weather requirements. Developing customized weather support plan for them under existing contract with Meridian.
- Providing RWIS data to Baron Services via MADIS. They have provided their ThreatNet software for use in the TOC.
- In response to recent events in PA and IA, WisDOT is developing a statewide snow emergency response plan. Will likely work through TOC and include requirements for forecast information.
- Part of Northwest Passage *Clarus* conops development team. Gathering metadata, and hope to have completed in September.
- Rebidding RWIS parts and installation contract. Exploring other options for data management.
- Notes: _____

