

Aurora Program

minutes

Aurora Board Meeting August 28, 2014 – Conference Call/Web Meeting

Individuals Participating:

Jason Norville, Pennsylvania DOT
Mike Kisse, North Dakota DOT
Max Perchanok, Ontario MOT
Jack Stickel, Alaska DOT&PF
Tina Greenfield, Iowa DOT
Linda Narigon, Iowa DOT
Thomas Lyden, Ohio DOT
Abner Johnson, Ohio DOT
Ron Hall, Kansas DOT
Dawn Gustafson, Michigan DOT
Jimmy White, Virginia DOT
Curt Pape, Minnesota DOT
Joe Doherty, New York State DOT
Steve Hancock, California DOT
Tim Peters, Illinois DOT
Roemer Alfelor, FHWA
Lee Smithson, AASHTO
Rick Nelson, AASHTO
Chris Albrecht, Iowa State University – InTrans

Meeting Agenda:

- 1) Call to Order (Jason Norville)
- 2) Past Minutes and Actions (Chris Albrecht)
- 3) Program Administration and Financials (Chris Albrecht)
- 4) Program Membership (Chris Albrecht)
- 5) 2014 Work Plan (Chris Albrecht)
- 6) October Board Meeting in Ithaca, New York (Chris Albrecht)
- 7) 2015 Work Plan and Proposed Projects (Chris Albrecht)
- 8) Ongoing Project Progress Updates (Chris Albrecht and Champions)
- 9) Other Business (All)

1. Call to Order

Jason Norville called the meeting to order just after 1pm (CDT).

2. Past Minutes and Actions

Chris Albrecht briefly reviewed the June 26 board web meeting minutes. After a short discussion, the board agreed to review and approve the minutes at a later date.

3. Program Administration and Financials

Chris Albrecht reviewed the latest administrative contract expenditures through July 31, 2014. He noted that approximately \$63,000 had been used to date, which included all board meeting and travel expenses. He also noted that these expenses were right on track with expectations.

4. Program Membership

Chris then noted that, in addition to California DOT joining as a new member for FY2014, Colorado DOT had joined Aurora as a member starting in FY2015. He also noted that there was interest in joining from Wyoming, Nevada, Indiana, and the District of Columbia recently. In addition, Chris noted that he had sent a letter to the chair of the PIARC subcommittee equivalent to the TRB winter maintenance committee welcoming their participation as an associate member.

5. 2014 Work Plan

As for the 2014 work plan, Chris briefly noted that it had been finalized, approved by the board, and submitted to FHWA.

6. October Board Meeting in Ithaca, New York

Chris Albrecht also reviewed the latest draft of the agenda for the next on-site board meeting in Upstate New York. He noted that the meeting would take place at the La Tourelle Hotel in Ithaca, on October 7-9, 2014. After reviewing the agenda day-by-day, he also noted that the agenda includes several added meetings with local researchers and companies in the region; including SUNY Oswego, Innovative Dynamics, and Cornell University. Chris also noted that Nevada DOT would be sending a representative to the meeting as a guest interested in joining, or re-joining in this case.

Chris also reminded the board members to make their travel arrangements as soon as possible through InTrans. Concerning travel to and from the airport in Syracuse, Chris noted that he, along with Jack and Jimmy, would provide rides for the other members. Curt Pape also volunteered to drive participants to and from Ithaca.

7. 2015 Work Plan and Proposed Projects

Chris Albrecht noted that the board would be refining research proposals prior to the Ithaca meeting. He then reviewed the most recent list of potential ideas, discussing details and volunteers to lead each through the review process:

Candidate A: Review and Application of Pavement Forecast Models – Chris noted that this idea would look at past experience of various agencies with using the available pavement forecast models or virtual RWIS. The application of the spring load restrictions model, which Aurora has already undertaken, is also a possible approach. After a short discussion, it was decided that Mike Adams and Max Perchanok would review and resubmit this candidate.

Candidate B: Review/Synthesis of Alternate Power Supplies – Next, Chris noted that this effort, which originated with the 2013 National Winter Maintenance Peer Exchange, would involve a small-scale state-of-the-practice review of available “off the grid” power options for RWIS operating in remote areas. These options would include fuel cells, thermo-electric generators, solar, wind, etc. It was also noted that the overall life-cycle cost, including maintenance and overall life span, would need to be considered. After a brief discussion, it was decided that Jack Stickel, Jeff Williams, and Abner Johnson would review and resubmit this second candidate.

Candidate E: Quality Checking of AVL Data – This proposed project would focus on ways to quality check AVL data, Chris noted. In addition, he noted that the effort could involve a survey of agencies utilizing AVL and see what their experiences are in regards to communication, sensors, data error, etc. After a brief discussion, it was decided that Max Perchanok and Tina Greenfield would review and resubmit this candidate.

Candidate F: Best Practices in Data Storage – Chris then noted that his likely small effort would review the past and current best practices by state in storing and archiving RWIS data. It was also agreed that Jack Stickel and Steve Hancock would review and resubmit this candidate.

Candidate G: Investigating Trends and Practices of Non-Traditional RWIS – Chris noted that this idea involved looking at the current trends, practices, and instrumentation options in the emerging use of non-traditional (compact, low-power, etc.) RWIS “Lite”. After a short discussion, it was decided that Jack Stickel, Steve Hancock, Jeff Williams, Abner Johnson, Thomas Lyden, Dawn Gustafson, and Tina Greenfield would review and resubmit this candidate.

Candidate H: Further Integration of the Knowledge Base and SICOP List – Chris noted that this effort would address integration of the functions found in the SICOP List Serve with the existing Knowledge Base for Road Weather and Winter Maintenance. After a lengthy discussion, Chris agreed to contact Wilf Nixon about the existing list serve. Lee Smithson and Rick Nelson also agreed to review and resubmit this candidate.

Candidate J: 2015 Winter Maintenance Peer Exchange: Chris noted that planning for the next peer exchange was already taking place and he expected that the Aurora board would likely want to contribute funding. After a short discussion, it was decided that Jason Norville, Mike Adams, Dawn Gustafson, and Travis Lutman would review and resubmit this candidate.

Finally, Chris reviewed the status of a few other ideas that had arose in the past year. The first proposed idea was previously known as ***Candidate I: Snow Liquid Water Equivalent for PWD Sensors***. The key objectives of this research were to 1) assess the PWD12 performance for measuring LWE under various precipitation type and temperature scenarios, 2) provide an analysis, and 3) develop recommendations on alternate sensors.

Chris noted that this PWD concept had been discussed in Boulder, then pursued by Jack Stickel and NCAR staff over the summer. After significant work and deliberation by the board, this candidate was “fast-tracked” in order to get the research tools in place for the coming winter. As a result, this was funded as the first 2015 research project, **Aurora Project 2015-01**, for \$35,000. It was also agreed that this project would ultimately cover the goals of another previous candidate, *Candidate C: Verification of Alternative Precipitation Measurement Sensors*, which would look at what types of precipitation sensors are available and their capabilities (rate-based, presence, water equivalent, or type).

Finally, the previous *Candidate D: Maximizing the Use of Mobile Sensors on Various Vehicle Types*, which involved evaluating the use of the available mobile weather sensors in regards to vehicle type and placement, was ultimately incorporated into the extension of **Aurora Project 2010-03** being initiated by the University of Waterloo.

8. Ongoing Project Progress

Chris Albrecht then gave very brief updates on the status of ongoing research efforts. Project champions included specifics as needed. Details of progress for each project are as follows:

Project 2007-05 – Multiple-Use ITS Data Collection Practices: Chris Albrecht noted that the final project report was completed and submitted for board review in late June. After a short discussion, Max Perchanok moved to accept the final report as complete. Jason Norville seconded the motion, and the board voted unanimously to approve it. Chris noted that he would post the final report as soon as possible.

Project 2009-01 – Summary and Comparison of Agency Experiences with Sensors: Next, Chris Albrecht briefly reviewed this project, noting that Ron Hall was currently updating the project spreadsheet with Kansas DOT’s experiences with environmental sensors. Chris also noted that the project was approximately 95% complete and would not be using the \$5,000 in allocated funds. He also expected that this project would be closed out by the end of 2014, plus Dawn Gustafson also noted that the project should be kept open while others reviewed and added to the spreadsheet.

Project 2010-03 – Results-Based Winter Road Maintenance Standards: Max Perchanok briefly reviewed progress on this effort being conducted by the University of Waterloo, noting that the current work scope was essentially complete. Max then noted that the University of Waterloo had sent him details on additional tasks they will undertake for just under \$105,000. He noted that he would forward the supplementary scope to the entire board, which had tentatively approved the funding increase in March. After further discussion, Chris Albrecht noted that Tina Greenfield and Curt Pape would be added to the project team. Chris noted that he would facilitate the contract extension along with Iowa DOT.

Project 2010-04 – RWIS Sensor Density and Location: Max Perchanok then noted that this research project was about 80% complete to date. Max also noted that this effort should be completed in by the end of March 2015.

Project 2011-02 – RWIS Training Tool: Tina Greenfield reported on this research effort, noting that the project was well underway and progressing well at about 25% complete to date. She added that the estimated project completion date was June 30, 2016. Chris Albrecht also noted that the project allocation/budget was \$265,000, with only a relatively small portion of that being spent and billed so far. Tina also noted that a project meeting with Iteris would be scheduled soon.

Project 2012-01 – Validate the Accuracy of Pavement Condition Predictions from Various Sources, Phase 1: Max Perchanok briefly reviewed the background to this effort, noting that the project was still in the RFP stage with little progress recently. Chris noted that \$100,000 had originally been allocated for this overall effort, but that this project number, Project 2012-01, would now cover only the first phase, which he estimated to cost around \$30,000.

Project 2012-03 – Cameras and Operational Impacts of Remote Road Conditions: Travis Lutman and Jeff Williams noted that the research team from BYU had essentially completed this project, with the draft final report sent out a few days prior for project team final review. Chris also noted that no additional funding would be needed past the \$25,000 original allocation/budget. After a short discussion, the board decided to vote on finalizing this effort until the October meeting in Ithaca.

Project 2012-04 – Communicating and Publicizing Road Weather and Operations Information: Chris Albrecht noted that he was drafting a scope of for the initial literature review for this effort.

Project 2012-05 – Seasonal Weight Restrictions Demonstration, Phase 1: Max Perchanok reviewed the background on this project, noting that USDA was selected to undertake this project. He also noted that they were making excellent progress to date. Chris also noted that this effort was split into two phases to accommodate the “old” Aurora close-out, with now \$80,000 allocated for a first phase and another \$200,000 allocated under FY2014.

Project 2013-02 – Transition of Clarus to MADIS: Jack Stickel briefly reviewed the overall intent of this effort, noting that the project was almost complete and would likely not be using the \$5,000 in allocated funds. He also expected that this project would be closed out by the end of 2014. He also asked the other board members to take time and review their sites and data within MADIS.

Project 2013-03 – Improving Real-Time Traffic Speeds for Performance Measurement: Tina Greenfield briefly reviewed this effort. She noted that a sole-source contract with Iowa State University’s Statistics Department was now underway.

Project 2013-04 – Quantifying Salt Concentration on Pavement, Phase 1: Max Perchanok briefly reviewed the scope of this effort, noting that the RFP to cover a literature search and technology review had been advertised. Chris also noted that the allocation for this first phase was \$35,000, with a second phase funded for an additional \$115,000 under the new TPF number as Project 2014-02.

Project 2013-05 – Knowledge Base Content Management: Chris Albrecht noted that the initial focus of this project, updating the knowledge base site with a new format, had been undertaken and completed by InTrans under the administrative contract. Chris also noted that once the old content is all moved to the new site, ongoing maintenance and marketing will still be needed. He added that the \$10,000 project allocation alone would likely not be enough to keep the site active for the next few years, but that he had put together a plan to utilize this money in the interim, which Tina now has.

Project 2013-06 – Make Aurora Severity Index Available to Other Agencies: Tina Greenfield reviewed progress on this effort, noting that the project was now under contract with Accuweather. To date, she added, \$23,193 had been expended. She also noted that this effort should be completed by the end of December 2014.

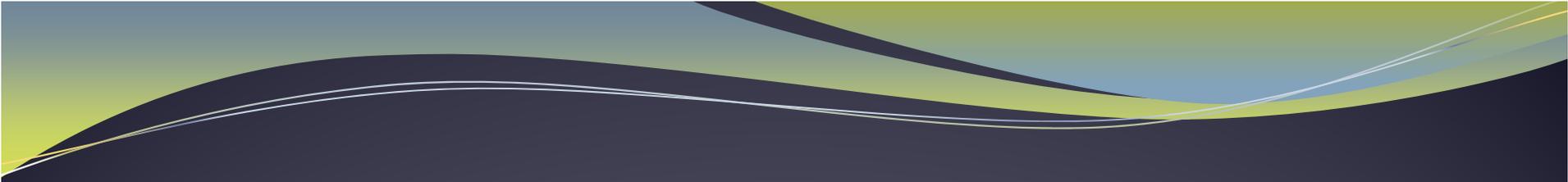
Project 2014-01 – Seasonal Weight Restrictions Demonstration, Phase 2: Chris Albrecht noted that \$200,000 had been allocated for this second phase under FY2014, as was noted earlier.

Project 2014-02 – Quantifying Salt Concentration on Pavement, Phase 2: Chris also re-iterated that this second phase was funded for an additional \$115,000 under the new TPF number as Project 2014-02.

Project 2014-03 – Validate the Accuracy of Pavement Condition Predictions from Various Sources, Phase 2: Chris noted that the \$105,000 second phase would be completed under the new TPF program number.

9. Other Business

No other business was discussed.



***- Aurora Program -
Board Web Meeting***

August 28, 2014

Today's Agenda:



- 1) Call to Order
- 2) Past Minutes and Actions
- 3) Program Administration and Financials
- 4) Program Membership
- 5) 2014 Work Plan
- 6) October Board Meeting in Ithaca, New York
- 7) 2015 Work Plan and Proposed Projects
- 8) Ongoing Project Progress Updates
- 9) Other Business

1) Call to Order

Jason Norville

Aurora Program Chair

Pennsylvania Department of Transportation

janorville@state.pa.us

Travis Lutman

Aurora Program Vice Chair

North Dakota Department of Transportation

tlutman@nd.gov

Dawn Gustafson

Aurora Program Past Chair

Michigan Department of Transportation

gustafsond@michigan.gov



2) Past Minutes and Actions

Aurora Program minutes

Aurora Board Meeting
August 8, 2013 – Conference Call/Web Meeting

DRAFT#2

Individuals Participating:

Jason Norville, Pennsylvania DOT
Travis Lutman, North Dakota DOT
Dawn Gustafson, Michigan DOT
Mike Adams, Wisconsin DOT
Joe Doherty, New York State DOT
Tim Peters, Illinois DOT
Ron Hall, Kansas DOT
Jeff Williams, Utah DOT
Curt Pape, Minnesota DOT
Max Perchanok, Ontario MOT
Tina Greenfield, Iowa DOT
Linda Narigon, Iowa DOT
Roemer Alfelor, FHWA
Lee Smithson, AASHTO
Sheldon Drobot, NCAR
Chris Albrecht, Iowa State University

Meeting Agenda:

3) Program Admin/Finance

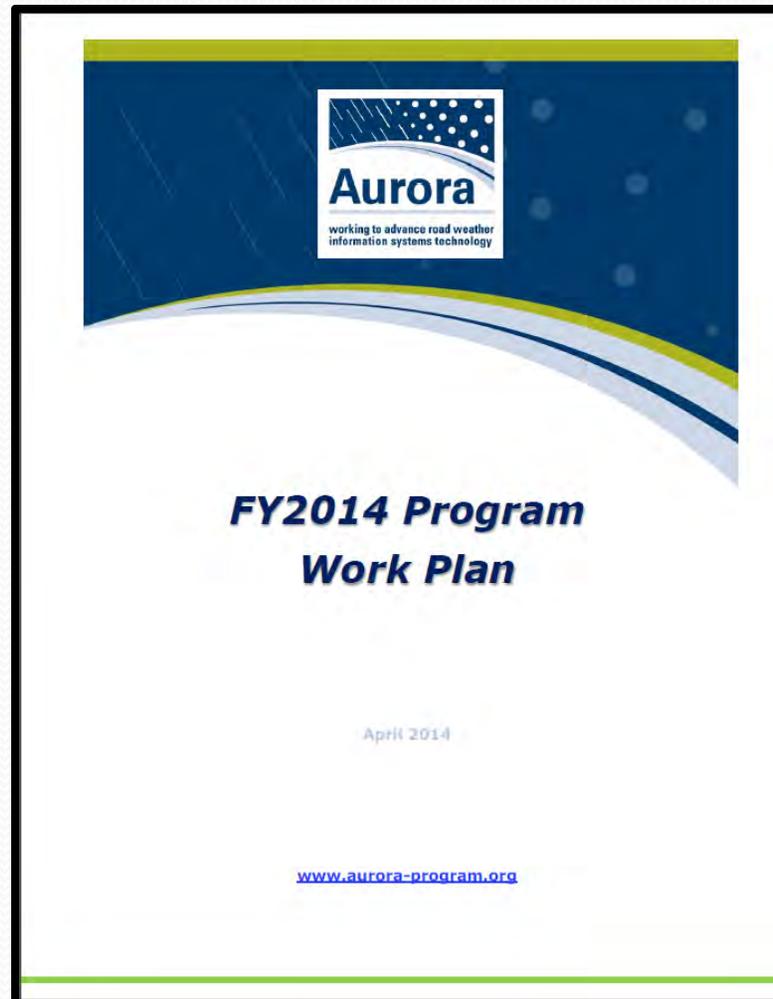
Year 10	474-77-41	January 1, 2013 - December 31, 2013		
	Total			
ISU Labor	\$47,465.65			
ISU Travel	\$4,546.74			
ISU Other	\$26,624.50			
Board Meetings	\$6,630.52			
Board Travel	\$16,230.45			
Total	\$101,497.86			
		Brief Summary of Year 10		
			Budget	Actual
		ISU	\$71,626.00	\$78,636.89
		Board Meetings/Travel	\$34,020.00	\$22,860.97
			\$105,646.00	\$101,497.86
Year 11	474-77-41	January 1, 2014 - December 31, 2014		
	Total			
ISU Labor	\$30,983.89			
ISU Travel	\$1,138.93			
ISU Other	\$16,290.51			
Board Meetings	\$4,976.57			
Board Travel	\$9,390.44			
Total	\$62,780.34			
		Brief Summary of Year 11 (through 7/31/2014)		
			Budget	Actual
		ISU	\$73,432.00	\$48,413.33
		Board Meetings/Travel	\$34,020.00	\$14,367.01
			\$107,452.00	\$62,780.34
Year 12	474-77-41	January 1, 2015 - December 31, 2015		
	Total			
ISU Labor	\$0.00			
ISU Travel	\$0.00			
ISU Other	\$0.00			
Board Meetings	\$0.00			
Board Travel	\$0.00			
Total	\$0.00			
		Brief Summary of Year 12		
			Budget	Actual
		ISU	\$75,293.00	\$0.00
		Board Meetings/Travel	\$34,020.00	\$0.00
			\$109,313.00	\$0.00

4) Program Membership

- ❖ ***California (joined for 2014)***
- ❖ ***Colorado (joined for 2015)***
- ❖ ***Wyoming, British Columbia, Nevada,
Indiana, DC***
- ❖ ***PIARC***



5) 2014 Work Plan



6) October Board Meeting

October 7-9, 2014

- Ithaca, New York ... La Tourelle Hotel
- Innovative Dynamics Inc.
- Cornell University Environmental & Atmospheric Sciences
- U of Albany
- Guest agency = NV
- **Travel Plans!**
- Other ...



6) October Board Meeting

Aurora Program Board Meeting

October 7-9, 2014
La Tourelle Hotel, Ithaca, New York, USA

AGENDA #7

Tuesday, October 7, 2014:

- 7:00a *Breakfast (depart for IDI at 8:30a)*
- 9:00a *Tour of Innovative Dynamics, Inc. Ithaca Facility*
- 10:30a *Meet with Cornell Univ. Environmental & Atmospheric Sciences Staff*
- 12:00p *Lunch*
- 1:00p *Meet with Other Interested Groups*
- 2:30p *Project Mini-Meetings and Brief Review of Ongoing Projects*
- 5:00p *Adjourn*
- 6:00p *Dinner*

Wednesday, October 8, 2014:

- 7:00a *Breakfast*
- I. 8:00a **Open and General Items**
 - 8:00a Review and approval of formal meeting agenda Jason Norville
 - 8:05a Review of previous minutes and actions Chris Albrecht
- II. 8:15a **Project Updates**
 - 8:15a 2007-05 - Multiple Use ITS Sites Jack Stickel
 - 8:20a 2009-01 - Comparison of Sensors Dawn Gustafson
 - 8:25a 2010-03 - Results Based Maintenance Standards Max Perchanok
 - 8:30a 2010-04 - RWIS Sensor Density Study Max Perchanok
 - 8:50a 2011-02 - RWIS Training Tool Tina Greenfield
 - 9:00a 2011-05 - Funding Source Identification Jack Stickel
 - 9:05a 2012-01 - Validate Predictions Max Perchanok
- III. 9:15a **Meet with SUNY Oswego Staff**
- 10:00a *Break*

Tuesday



6) October Board Meeting

Thursday

- IV. 10:15a Project Updates (continued)**
- 10:15a 2012-03 - Cameras and Remote Conditions Travis Lutman
 - 10:20a 2012-04 - Communicating Information Joe Doherty / Chris Albrecht
 - 10:30a 2012-05 - Seasonal Weight Restrictions Max Perchanok / Maureen Kestler
 - 10:50a 2013-02 - Transition Clarus to MADIS Jack Stickel
 - 10:55a 2013-03 - Improving Estimation of Speed Tina Greenfield
 - 11:00a 2013-04 - Quantifying Salt Concentration Max Perchanok
 - 11:10a 2013-05 - Knowledge Base Content Management Tina Greenfield
 - 11:20a 2013-06 - Weather Index Expansion Tina Greenfield
 - 11:30a 2012-05 - Seasonal Weight Restrictions 2 Max Perchanok
 - 11:40a 2013-04 - Quantifying Salt Concentration 2 Max Perchanok
 - 11:50a 2012-01 - Validate Predictions 2 Max Perchanok

12:00p Lunch

- V. 1:00p Future Meetings and Calls** Jason Norville and Chris Albrecht

- VI. 1:20p Program Administration and Financials** Chris Albrecht
- 1:20p Discussion of membership payments / contributions
 - 1:25p Discussion of program expenditures and contracting
 - 1:40p Discussion of management contract and old/new program split

- VII. 2:00p Round Robin/Member Agency RWIS Updates** All Participants

3:15p Break

- VIII. 3:30p Round Robin/Member Agency RWIS Updates (continued)** All Participants

5:00p Adjourn

6:00p Dinner

Thursday, October 9, 2014:

7:00a Breakfast

- IX. 8:00a 2015 Work Plan** Chris Albrecht
- 8:00a Discussion of plan sections
 - 8:15a Review of estimated budget for FY2015 projects
 - 8:45a Final review and discussion of FY 2015 projects

10:00a Break

- X. 10:15a 2015 Work Plan (continued)** Chris Albrecht
- 10:30a Discussion of FY 2015 project teams

- XI. 11:00a National Initiatives and Partnerships (5 minutes each)**
- FHWA Weather Team Roemer Alfelro
 - ITS America Dawn Gustafson
 - TRB Task Forces and Committees Max Perchanok
 - AASHTO/SICOP, PIARC, SIRWEC Max Perchanok
 - AMS Mike Adams
 - Clear Roads, PNS Tina Greenfield
 - ENTERPRISE, MDSS, NTCIP Curt Pape
 - Other Initiatives/Groups All

- XII. 11:30 Other Business** All Participants

11:45 Adjourn

Wednesday



7) FY2015 Plan and Program

Candidate A: Take available *pavement forecast models* and review them head to head to see what works best ... Do roadway typical sections significantly affect pavement forecast? (asphalt vs. concrete, thickness, sub-base, elevation, bridges, etc.)?

Candidate B: What is available for *power supplies* and what type of maintenance is needed? What is the life span?

Candidate C: *Verification of Alternative Precipitation Measurement Sensors* ... types available and their capabilities (rate-based, presence, water equivalent, or type)?

Candidate D: Evaluate *mobile sensors* (weather telematics, Vaisala, Boschung, etc.) precision, accuracy, survivability, placement, etc. ... Is it possible to measure this from a snow plow or patrol truck?

7) FY2015 Plan and Program

Candidate E: Ways to quality *check AVL data* to insure usable data is obtained ... survey agencies utilizing AVL and see what their outcomes are. (communications, sensors, data error, etc.)

Candidate F: What are the best practices in *data storage* and in *archiving* of RWIS data?

Candidate G: What are the current trends, practices, and options for the use of non-traditional, low-power, or compact *RWIS Lite*?

Candidate H: Integrating SICOP List and Knowledge Base into a *Hub*?

Candidate J: 2015 Peer Exchange?

7) FY2015 Plan and Program

Funded:

- ❖ Project 2015-01: Snow Liquid Water Equivalent for Forward Scatter PWD Series Sensors ... \$30,000

Other Ideas:

- State-of-the-practice in **remote sensing**?
- Revisiting / Synthesis of **winter road condition terminology**
- State of the art and future needs of **Road Weather Information for Surface Transportation**
- **Integrating RWIS** with Other Roadside Data Collection Requirements
- Correlating **freezing precipitation to pavement conditions**
- Improved and lower-cost **mobile weather** observations?
- Using **social media** in Winter Operations

8) Ongoing Projects

14 "old" ongoing projects

Aurora Program - Ongoing Project Status

February 7, 2014

FY 2007 through FY2009

- 2007-05: Multiple-Use ITS Data Collection Practices (\$15,000) = 60% complete
- 2009-01: Summary and Comparison of Agency Experience w/ Sensors (\$5,000) = 95% complete

FY 2010

- 2010-03: Results-Based Winter Road Maintenance Standards (\$155,000) = 85% complete
- 2010-04: RWIS Sensor Density and Location (\$100,000) = 50% complete

FY 2011

- 2011-02: RWIS Training Tool (\$265,000) = 15% complete
- 2011-05: Funding Sources Identification (\$5,000) = 10% complete

FY 2012

- 2012-01: Validate the Accuracy of Pavement Condition Predictions (\$100,000) = 5% complete
- 2012-03: Cameras and Operational Impact of Remote ... Monitoring (\$25,000) = 25% complete
- 2012-04: Communicating and Publicizing Information (\$30,000) = 5% complete
- 2012-05: Seasonal Weight Restrictions Demonstration (\$250,000) = 5% complete

FY 2013

- 2013-01: 2013 National Winter Maintenance Peer Exchange (\$35,000) = 95% complete
- 2013-02: Transition of Clarus to MADIS (\$5,000) = 20% complete
- 2013-03: Improving Estimation ... for Performance Measurement (\$130,000) = 5% complete
- 2013-04: Quantifying Salt Concentration on Pavement (\$150,000) = 5% complete

9) Other Business

The screenshot displays the Aurora program website with the following content:

- Header:** "working to advance road weather information systems technology" and the Aurora logo.
- Navigation:** Home, About, Projects, News, Participate, Resources, For Members.
- Projects:** Ongoing, Completed.
- Upcoming Events:**
 - Thursday, May 19, 2011 at 12:00 pm (CDT) - Aurora Board Web Meeting
 - Thursday, June 30, 2011 at 2:00 pm (CDT) - Aurora Administrative Conference Call
 - Thursday, July 7, 2011 at 12:00 pm (CDT) - Aurora Board Web Meeting
 - Monday, September 19, 2011 in Bozeman, Montana - Aurora Board Meeting
 - Tuesday through Thursday, September 20-22, 2011 in Bozeman, Montana - National Winter Maintenance Peer Exchange
- Who We Are:**

Aurora is an international partnership of public agencies who work together to perform joint research activities in the area of road weather information systems (RWIS). This website is designed to introduce the program, the partners, and our collaborative research projects.

Why Join Aurora?

 - to help set the agenda for collaborative research, development, and deployment of road and weather information systems (RWIS).
 - to multiply your agency's financial resources to address its most pressing RWIS-related challenges.
 - to develop relationships with national and international, public and private leaders in RWIS equipment, decision support systems, standards, and training.

Board Chair: Joe Doherty, New York State DOT

Members: Indiana DOT
- Ongoing Projects:**
 - 2011 National Winter Maintenance Peer Exchange
 - Peer Exchange
 - Basic RWIS
 - Best Practices for RWIS
 - Cold Road
 - Winter Road

When you face winter road maintenance challenges, who can you turn to?

Want to be better prepared when a holiday storm suddenly crosses roads with black ice?

How can your quality get new from operators to be ahead on the job?

Where can you get needed information about collaborative planning, equipment, and training to help you meet the challenges of winter road maintenance?

For help in these situations and more, turn to these programs:

Snow and Ice Cooperative Program (SICOP), Aurora, and Clear Roads
- Right Side Panel:**

Aurora membership

Full members program and into an effort for funding and support and also other related activities. Membership is open to all public sector transportation-related agencies around the globe as of 5/2/09.

Associate members provide additional data and other information. Associate members are generally state-level, municipal entities and a combination that are represented by an active Aurora member. (click on the link below)

Members:

 - Alaska Department of Transportation & Public Facilities
 - Arizona Department of Transportation
 - California Department of Transportation
 - Michigan Department of Transportation
 - New York State Department of Transportation
 - North Carolina Department of Transportation
 - Ohio Department of Transportation
 - Pennsylvania Department of Transportation
 - South Dakota Department of Transportation
 - Texas Department of Transportation
 - Utah Department of Transportation
 - Virginia Department of Transportation
 - Wisconsin Department of Transportation

Associate members:

 - Federal Highway Administration - Road Weather Management Team
 - National Oceanic and Atmospheric Administration - National Weather Service Forecast Systems Laboratory
 - National Center for Meteorological Research
 - North Carolina State University
 - University of Colorado
 - University of Illinois
 - University of Michigan
 - University of Minnesota
 - University of Wisconsin - Madison
 - University of Wisconsin - Milwaukee
 - Virginia Polytechnic Institute and State University

Aurora

working to advance road weather information systems technology

to the common goal of saving lives, reducing the economic consequences of winter weather operations, and providing better service to the public.

Join Aurora and . . .

 - multiply your agency's financial resources to address its most pressing RWIS-related challenges
 - help set the agenda for collaborative research, development, and deployment of road and weather information systems (RWIS)
 - develop relationships with national and international, public and private leaders in RWIS equipment, decision support systems, standards, and training

www.aurora-program.org