Aurora Program - Ongoing Project Status

March 27, 2012

FY 2000 through FY 2007

- 2000-01: Benchmarking of RWIS Forecasts ($50,000 in-kind) = 100% complete
- 2007-01: RWIS Equipment Monitoring System, Phase 2 ($135,000) = 5% complete
- 2007-04: Development of a Freezing Drizzle Algorithm ($85,000) = 90% complete
- 2007-05: Multiple-Use ITS Data Collection Sites ($15,000) = 15% complete

FY 2008

- 2008-01: National Road Weather Testing Program ($11,000) = 20% complete
- 2008-03: MDSS Demonstration in Ontario ($75,000 in-kind) = 25% complete

FY 2009

- 2009-01: Summary and Comparison of Sensors ($55,000) = 50% complete
- 2009-04: Road Weather Education Enhancements ($20,000) = 35% complete
- 2009-05: Further Development of PPAES ($83,000) = 50% complete

FY 2010

- 2010-01: Enhancements of AI/RWIS CBT ($50,000) = 65% complete
- 2010-02: Mobile-Weather Data Collection Guidelines ($25,000) = 10% complete
- 2010-03: Results Based Winter Road Maintenance Standards ($120,000) = 75% complete
- 2010-04: RWIS Sensor Density Grid ($100,000) = 5% complete
- 2010-05: Determining RPU and Sensor Failure ($5,000) = 10% complete

FY 2011

- 2011-01: Third Peer Exchange ($30,000) = >95% complete
- 2011-02: RWIS Training Tool (200,000) = 10% complete
- 2011-03: Benefit/Costs and Instruction for Migrating to Open RWIS ($75,000) = 5% complete
- 2011-04: Study of MDSS Costs ($20,000) = 5% complete
- 2011-05: Funding Sources Identification ($5,000) = 5% complete

Project Status Report

March 21, 2012

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

Champion: Max Perchanok, Ontario Ministry of Transportation

Status:

- NCAR completed surface temperature verification analyses for the Maritime Provinces and Finland. These were the only suitable locations where data was obtained.
- The University of Waterloo was tasked with linking the verification results with mapping layers from which they could test the association of trends in RWIS forecast accuracy with geographical factors.
- ***The University of Waterloo has included a proposal for Project 2010-04 with the draft final report for 2000-01.***
- ***The revised final report was sent to Chris Albrecht for distribution to the entire board.***
- ***Dr. Fu presented to the board on February 1, 2012.***
- ***Chris Albrecht forwarded the final report to the board on March 20.***
- ***The full board will vote on approval of the final report at the March 2012 board meeting in Salt Lake City, Utah.***
- University of Waterloo submitted a proposal for 2010-04. The proposal follows on work completed in project 2000-01, using data, information and contacts generated in that project. It will be reviewed by the project committee at a mini-meeting prior to the Salt Lake meeting, with the intention to prepare a work assignment with the University.

Approximate % Complete: 100 %

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

Additional Comments:

- This is an in-kind project for Ontario Ministry of Transportation for FY2000 and FY2001.
- ***The Aurora board voted to amalgamate Projects 2000-01 and 2010-04 at the spring 2011 meeting because both the data and methods of analysis used in 2000-01 are highly suited to the objectives of 2010-04.***
- The completed report for 2000-01 fulfills MTO's in-kind obligation for that project.
- ***After reviewing the proposal, the board will decide whether to fund 2010-04 as an ongoing project.***
- Project Team: Max Perchanok (champion), Mike Adams, Curt Pape, Jeff Tilley, Sheldon Drobot, Dan Huang

Project Status Report

March 20, 2012

Project: 2007-01: RWIS Equipment Monitoring System, Phase 2

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

Objective: to expand the RWIS Equipment Monitoring System 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 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:

- This project has absorbed the discontinued Project 2005-01: Development of a RWIS Quality Assurance Monitoring System that was intended to 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. The revised scope of this project will incorporate the Clarus System quality checking output for objective #4.
- ***A detailed analysis of the Clarus System quality checking output will be completed, then a draft scope of work will follow.***
- ***Chris Albrecht has proposed a project call and will schedule a mini-meeting for the Salt Lake City meeting in March 2012 to discuss a revised scope and RFP.***

Approximate % Complete: 5 %

Barriers/Issues: need a final scope of work as a basis for an RFP

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

Additional Comments:

- This project was funded for $25,000 in FY 2007 and for an additional $10,000 under FY 2008.
- This project has also been combined with Project 2005-01 and its $100,000 in funding.
- ***The total project budget is $135,000.***
- Project Team: Jack Stickel (champion), Dawn Gustafson, Curt Pape, Mike Adams, Tina Greenfield, Joe Doherty

Project Status Report

March 21, 2012

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

Champion: Max Perchanok, Ontario Ministry of Transportation

Status:

- After a conference call on December 9, 2011, UND has recently agreed to accept the extension on mutually agreeable terms, with a new completion date of June 30, 2012.
- Leon Osborne has been working with Jeff Tilley to obtain all the project data. He has the 2007-2009 season, but does not yet have 2009-2010.
- ***The first task for the extension is to provide us an outline of what will be in the report. Leon did that on the phone and will send it in email to Max. Max was quite happy with what Leon described on the phone and it addresses the issues that held this project up in the past.***
- ***A contract extension until June 30, 2012 was signed on December 29, 2011 with the terms:***
  - ***Provide a partial draft and a full table of contents for the report prior to beginning the final analysis and report writing.***
  - ***Timelines were created for the remaining tasks.***
  - ***Payment of remaining funds upon acceptance of the completed report.***
- ***Leon Osborne has taken on responsibility for the project, will complete any required analysis and will write the report.***
- ***Leon and Max talked through a report outline on Feb. 7 and Max accepted it. A written version was provided on March 20. Leon plans to have the project completed by April 30, 2012.***

Approximate % Complete: 90 % (Phase 2)

Barriers/Issues: Lack of project documentation has required significant spin-up on project activities, data collection, and analyses conducted prior to January 2012. This has slowed initial progress more than expected. Impacts are lessening with time and more rapid progress is now being made. Still needing the calibration report from NCAR.

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

Additional Comments:

- ***This project was funded for $15,000 in FY 2007 and $70,000 in FY 2008, for a total of $85,000.***
- Phase I was completed in October 2008
- ***If UND agrees to the terms of extension then the project will be completed.***
- Project Team: Max Perchanok (champion), Curt Pape, Mike Adams, Sheldon Drobot, Leon Osborne

Project Status Report

March 20, 2012

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

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

Status:

- The overall objective of this project remains the same – use RWIS sites for different types of data collection. The goals, however, have been slowly evolving over the past two years. The current project goal is to integrate non-intrusive traffic data collection devices into a RWIS site.
- There is a realization that each DOT has unique IT infrastructure, power, communication, traffic data needs, and contractual relationships. There needs to be different, specific solutions to meet these challenges. Therefore, the two goals for project are:
  - Document existing DOT programs for non-intrusive traffic data collection among AURORA states. This would include Utah, New York, and Iowa.
  - Develop a software solution for full Wavetronix integration for the SSI Linux RPU (LX-RPU). A prototype would be deployed for an Aurora state (Alaska); other Aurora states would be eligible to follow on at a reduced cost. Alaska DOT has a quote for the LX-RPU integration and is ready to go to work.
- The non-intrusive RWIS traffic integration from other states could be documented as part of Aurora Project 2009-03 "*Knowledge Base for RWIS"*.
- Other options for this project would include air quality monitoring for: Ozone O3, Nitrogen Dioxide O2, Carbon Monoxide CO, Volatile Organic Compounds VOC, Carbon Dixoide CO2, Sulpher Dioxide SO2, Hydrogen Sulphide H2S, Particulate PM10, PM2.5
- ***A revised draft scope has been drafted by InTrans for review by Jack Stickel and the project team.***
- ***A project mini-meeting has been scheduled for the March 2012 Utah board meeting.***

Approximate % Complete: 15 %

Barriers/Issues: Final scope of work needs to be approved by the project team

Recommendations:
- X continue as planned
- ____ continue with modifications
- ____ discontinue

Additional Comments:

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

Project Status Report

March 21, 2012

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 program to various audiences and sources of support. A national network of facilities can help states and agencies find appropriate and well-suited providers for transportation weather research.

Status:

- 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.***
- ***Chris Albrecht forwarded materials concerning a testing facility database to the project team.***
- This project is on hold waiting to see what role the Knowledge Base will play in this issue.
- ***A project mini-meeting has been scheduled for the March 2012 Utah board meeting.***

Approximate % Complete: 20 %

Barriers/Issues: Waiting on direction of the Road Weather Knowledge Base effort

Recommendations:
- X continue as planned
- ____ continue with modifications
- ____ discontinue

Additional Comments:

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

Project Status Report

March 20, 2012

Project: 2008-03: MDSS Demonstration in Ontario

Champion: Max Perchanok, Ontario Ministry of Transportation

Status:

- ***A five-year demonstration and implementation project has been submitted to MTO senior management for Central Agency funding approval. Approval is anticipated in April.***
- The project is a phased implementation of components including; treatment recommendations based on integrated road-weather forecast and rules of practice, alternative user-input treatments, tracking and prediction of road condition indicators, prediction of conditions and treatments on road segments between RWIS stations, automated feedback of treatments undertaken and actual road conditions, automated tracking of road condition performance measures against standards, tracking of road salt use against weather-specific benchmarks, archiving of information, and dashboard displays of summarized information for contract oversight staff. It includes a requirement to integrate RWIS and AVL information from various service providers and to host the system on an external web site.
- An RFP process will be used to award the work to an external service provider. It will include components for validation, performance measurement of the system, and requirements for continuous calibration and improvement of models used.
- ***The five year demonstration ending in 2016 will provide practical experience with MDSS to MTO, municipalities and maintenance contractors, and will result in a contract specification for future services.***
- MTO's weather service provider conducted an independent, limited-scope demonstration and proof-of-concept based on the NCAR approach, with two Area Maintenance Contractors and two municipalities, January-March 2012 and will report on results in May.
- ***A project mini-meeting has been scheduled for the March 2012 Utah board meeting.***

Approximate % Complete: 25 %

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

Additional Comments:

- ***Funding of $75,000 in-kind will cover Ontario's membership for FY 2008 through FY 2010.***
- ***The project did not begin until 2011, but will cost more than $75,000. The in-kind accounting will require adjustment once project costs are known in early 2012.***
- Project Team: Max Perchanok (champion), Curt Pape, Dawn Gustafson, Jack Stickel, Sheldon Drobot

Project Status Report

February 1, 2012

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

Champion: Dawn Gustafson, Michigan Department of Transportation

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

Status:

- ***Past Actions: This project was originally established to summarize and compare the Lufft R2S and other sensors. It was determined that this evaluation can be completed as a white paper. Decision was made to move this project forward to include the creation of a matrix that will compare different sensors with different agencies' experiences.***
- Lufft R2S evaluation: TBD
- Potential questions include; how integration was accomplished, an inventory of sensors used/tried, and experiences with various sensors.
- Comparison Matrix: Matrix developed by Clear Roads was used to begin development of a matrix of sensors. Draft was sent to team for review and revised.
- Matrix was modified from comments received. A tab was added to the bottom of the spreadsheet for Sensor Types.
- ***Next Steps: The team will need to create a list of sensors/vendors that will be included in the initial deployment. The spreadsheet should be sent to all Aurora and Clear Roads members for their input.***
- ***Dawn Gustafson noted that they may need some assistance from InTrans in following up on content in the coming months.***

Approximate % Complete: 50 %

Barriers/Issues: None

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

Additional Comments:

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

Project Status Report

March 8, 2012

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. This project 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.

Status:

- Questions that need answers
  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?
- Mike Adams had shared that the Wisconsin DOT library would be able to perform a literature search and assist in developing and distributing a survey for the group free of charge, so the group agreed to proceed through them for Phase I. The literature search completed by Wisconsin DOT. In general, most information obtained showed heavy use of AASHTO AI/RWIS training. Does this provide what is needed? Can we set up some guidance as to what training would be helpful for AI or RWIS (individually)?
- To date, it has been decided that:
  - ***A training section will be included under the 'wiki'***
  - Include all materials such as power points, hand outs, etc. Each must be dated
  - After materials are collected, answer - "What gaps still exist?"
  - Review TCCC website and Peer Exchange information
  - Each survey respondent will be contacted to see if they are willing to share training materials.

Approximate % Complete: 35 %

Barriers/Issues: None

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

Additional Comments:

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

Project Status Report

February 1, 2012

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

Champion: Leigh Sturges, 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:

- Algorithm Development: Refinement of the blending of radar and surface precipitation occurrence and rate analyses software.
  - Added functionality to find the effective range of each individual radar for four quadrants.
  - Added a correction step to ensure consistency between radar- and surface observation-estimated precipitation fields. Corresponding analysis values obtained using radar and surface observations are compared and the mean difference between these values, for each radar, is determined. Then, radar- and surface-based analysis fields are corrected such that consistent analyses are produced.
- Validation Activities: Completed data-denial validation scheme, with performance measures and summary scores for the 20 test cases currently being computed.
- Challenges Encountered: When altering the PPAES blending algorithm, efficiently deriving and applying a correction to each individual radar can be challenging.
- Schedule:
  - Complete flat terrain testing of the current version of PPAES, including validation (contingency table-based and summary performance metrics) and subsequent refinement based on results of the validation).
  - ***Begin work on software to handle complex terrain issues. This is a task that will involve multiple quarters of work.***
- ***Leigh Sturges received some documentation on this effort from Jeff Tilley at UND.***

Approximate % Complete: 50 %

Barriers/Issues: None

Recommendations:
- X continue as planned
- ____ continue with modifications
- ____ discontinue

Additional Comments:

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

Project Status Report

February 1, 2012

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

Champion: Tina Greenfield, Iowa Department of Transportation

Status:

- ***This was the #1 Ranked Peer Exchange Project from 2009.***
- Lee Smithson, Steve Lund, and Bill Hoffman presented a resolution (asking permission) at the Summer AASHTO SCOM Meeting this past July in Savannah, to have AASHTO ask State DOT's to contribute $3,750 for this CBT enhancement.
- So far 29 state DOTs have contributed to the fund.
- Tina has reviewed three of the web-ized CBTs.
- GanTek will finish the other operations CBTs before he starts on the AI/RWIS CBT. So far he has finished three of the operations CBTs and has nearly completed a fourth CBT. Various folks in the state DOTs are testing them.
- The following CBTs have been completed are being reviewed by various state DOTs:
  - Blowing Snow Mitigation
  - Deicing
  - Equipment Maintenance
  - Performance Measures in Snow and Ice Control
  - Proper Plowing Techniques
  - Selecting Snow and Ice Control Materials to Mitigate Environmental Impacts
  - Winter Maintenance Management
- ***The re-development of the Anti-icing/Road Weather Information System (AI/RWIS) CBT is well underway.***

Approximate % Complete: 65 %

Barriers/Issues: None

Recommendations:
- X continue as planned
- ____ continue with modifications
- ____ discontinue

Additional Comments:

- ***This project was funded for $50,000 in FY 2010***
- Project Team: Tina Greenfield (champion), Dawn Gustafson, Dean Kernan, Mike Adams, Max Perchanok, Jeff Tilley, Bill Hoffman
- ***Partners include Clear Roads and AASHTO representatives as well.***

Project Status Report

March 21, 2012

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

Champion: Curt Pape, Minnesota Department of Transportation

Status:

- Bill Hoffman had suggested teaming up with the AASHTO equipment group to accomplish the goals of this project.
- This project is a sister project 2010-04.
- The first step will likely be a synthesis.
- Paul Brown, Clear Roads Chair, will be hosting a vendor workshop at the Clear Roads Winter Meeting in Virginia to discuss how the vendors will begin working with DOTs on Open Architecture and Open Data Platforms.We should get some very good information on how best to create guidelines for Mobile Weather Data Guidelines.
- ***Curt Pape has taken over as project champion.***
- ***A mini-meeting will likely be held in Utah.***

Approximate % Complete: 10 %

Barriers/Issues: None

Recommendations:
- X continue as planned
- ____ continue with modifications
- ____ discontinue

Additional Comments:

- This project was funded for $25,000 in FY 2010
- ***Project Team: Curt Pape (champion), Max Perchanok, Gabe Guevera, Joe Doherty, Leigh Sturges, Li Fu, Sheldon Drobot***

Project Status Report

March 23, 2012

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

Champion: Max Perchanok, Ontario Ministry of Transportation

Status:

- Analysis of Safety Benefit of Winter Maintenance – Models were expanded to include 31 highway sites across Ontario. A model was completed that relates hourly collision frequency to weather, RSI, traffic exposure, site calibration, seasonal and within-storm time trend. Another model relates collision severity to road type, number of lanes, speed limit, RSI, site geometry, driver and vehicle characteristics, and traffic exposure. The models were applied to estimate the incremental safety benefit in using an average, within-storm LOS standard in addition to the existing standard of bare pavement regain time following the end of a storm.
- Analysis of Mobility Benefit of Winter Road Maintenance – In a paper to be presented at the TRB international conference, models were expanded, employing a matched-pair technique, to predict changes in traffic volume and speed with and without snow events, as a function of weather, RSI, V/C ratio, and site-specific calibrations. A case study estimates the incremental mobility benefits (for travel demand and travel time) in using an average, within-storm LOS standard in comparison with the 8-hour standard of bare pavement regain time following the end of a storm at a highway network level.
- The safety and mobility models will be improved by developing case studies in which the observed accident rate are mobility benchmarked to the observed, event-based RSI. Changes in accident rate or mobility will then be estimated for selected, across-the-board improvements in RSI. This will relate RSI levels to safety and mobility levels, and facilitate a cost-benefit analysis for level of service vs safety and mobility. Safety and mobility levels associated with various storm types or severity will also be estimated.
- ***Cost Model – This work is at a beginning stage, with planned completion in mid-2012 and presentation at TRB in 2013. The purpose is to predict the change in cost of providing winter maintenance, with a change in standards or level of service. The model will incorporate weather severity, road class or traffic level, service standards and maintenance practices, and may include the development of an input-output type model similar to predict the road conditions resulting from a set of maintenance practices applied to a road-weather scenario.***
- Benchmarking of Performance Measures (Liping Fu, Feng Feng, Raqib Mian, and MTO)
  - Traction-based classifiers for snow cover were presented at TRB2009 and 2010 and at PIARC2010, An analysis of speed as a performance measure using the Iowa data is nearing completion. Traction measurements were compared with a spectral sensor, highlighting how measures can differ (submitted for Aurora 2007-02).
  - A web-cam based classifier for snow cover was developed in 2010 (Mian MSc Thesis).
  - A Road Surface Index was developed to relate visual descriptors to traction levels.
  - Additional data were collected this winter to compare and inter-calibrate performance measures based on conventional bare pavement reports, web-cam and multi-sprectral camera-based reports, traction based reports, and plow movement based reports. This will be completed in May and presented at an MTO meeting in early June.

Approximate % Complete: 75 %

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

Additional Comments:

- ***This project was funded for $120,000 in FY 2010***
- ***MTO funding schedule ends March 31 2012.***
- Aurora funding continues another year.
- Project Team: Max Perchanok (Champion)**,** Dawn Gustafson**,** Joe Doherty**,** Sheldon Drobot**,** Neal Hawkins, Chris Albrecht

Project Status Report

March 21, 2012

Project: 2010-04: RWIS Sensor Density Grid

Champion: Max Perchanok, Ontario Ministry of Transportation

Status:

- The board voted to amalgamate 2000-01 and 2010-04 at the spring 2011 meeting because both the data and methods of analysis used in 2000-01 are highly suited to the objectives of 2010-04.
- The University of Waterloo was asked to include a proposal for 2010-04 with the report for 2000-01. The completed report for 2000-01 will fulfill MTO's in-kind obligation for that project.
- ***A proposal for 2010-04 was forwarded to the project team on March 20 by Chris Albrecht.***
- After reviewing the proposal, the board will decide whether to fund 2010-04 as an ongoing project.
- ***University of Waterloo submitted a proposal for a comprehensive, 2-year project that will provide an understanding of how the accuracy of RWIS information varies with station spacing and location in different climate zones, and of the relation between network accuracy and cost. The study uses theoretical models to provide a framework for understanding, and analyses of RWIS data to develop practical tools and guidelines for planning an RWIS network.***
- ***The proposed work follows on work completed in project 2000-01, using data, information and contacts generated in that project. It will be reviewed by the project committee at a mini-meeting prior to the Salt Lake meeting, with the intention to prepare a work assignment with the university.***

Approximate % Complete: 5 %

Barriers/Issues: None

- ***Work plan requires interaction with Aurora members at several intervals and will require scheduling at future Aurora meetings.***
- ***Need to update project team list.***

Recommendations:
- X continue as planned
- ____ continue with modifications
- ____ discontinue

Additional Comments:

- ***This project was funded for $100,000 in FY 2010***
- The board voted to amalgamate 2000-01 and 2010-04 at the spring 2011 meeting because both the data and methods of analysis used in 2000-01 are highly suited to the objectives of 2010-04. U Waterloo was asked to include a proposal for 2010-04 with the report for 2000-01. The completed report for 2000-01 will fulfill MTO's in-kind obligation for that project.
- Project Team: Max Perchanok (champion), Jack Stickel, Curt Pape, Dawn Gustafson, Mike Adams, Jason Norville, Jeff Tilley, Tina Greenfield, Mike Kisse

Project Status Report

December 9, 2011

Project: 2010-05: Determining RPU and Sensor Failure

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

Background: Determining the life expectancy of ITS devices such as RWIS RPUs and sensors would help anticipate the mean time between failures and help agencies plan for funding, maintenance, procurement, and replacement. This process is being examined under NCHRP 8-71 - Methodology for Estimating Life Expectancy of Highway Assets, which looks at determining the life expectancy for major assets, investigating the benefits of maintenance actions, and documenting the impact of life expectancy. The report is anticipated soon. A similar project could be accomplished for RWIS devices. Purdue University is doing the NCHRP 8-71 work. Since they have experience in this area, it is likely that (1) they can do the work, and (2) would be interested in the project. I doubt the $5,000 allocated for the Aurora project would cover the work, so this is an area the board would need to discuss. Funding for maintenance and replacement of ITS devices is covered in the FHWA Office of Operations Transportation Systems Management & Operations Operating Cost Eligibility Under the Federal-Aid Program. Interpretation, rationale, examples, and questions about ITS)deployments are covered. Key elements that are applicable for RWIS deployments include typical elements that are eligible, typical elements that are not covered, spare parts, and Congestion Mitigation and Air Quality (CMAQ) Improvement Program. The FHWA division offices have a great deal of discretion and flexibility in determining the eligibility of specific activities, the allowances for preventive maintenance in Title 23 USC 116(d), and other Federal-policies.

Status:

- Jack Stickel has noted an NCHRP project being conducted by Purdue University that this effort may be able to build on.
- There are several contract mechanisms for Purdue University to do the work:
  - Aurora could contract with Purdue for the work. Some state DOTs are able to contract with universities directly.
  - It is possible to transfer the Aurora funds to NCHRP under a task order to extend NCHRP 8-71. This process would have to be approved by the NCHRP's panel approval and guidance.

Approximate % Complete: 10 %

Barriers/Issues: None

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

Additional Comments:

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

Project Status Report

December 27, 2011

Project: 2011-01: Third Peer Exchange

Champion: Tina Greenfield, Iowa Department of Transportation

Background: Aurora has been actively researching a number of surface transportation weather projects; while Clear Roads is researching materials, equipment, and practices related to winter maintenance operations. Unfortunately, information and research results sometimes do not reach end users in all states or at different agency levels. The winter maintenance community needs to be more aware of the research conducted by Aurora and Clear Roads and other research organizations and take a more active role in requesting research to meet winter operational needs. Therefore, the objective of this project is to conduct a National winter maintenance meeting for Aurora, Clear Roads, SICOP, PNS and the FHWA to share research results from the Peer Exchanges held in 2007 and 2009, get updates from each snow-belt state, and discuss other issues related to winter snow removal operations. Each state will be given the opportunity to send one representative to the meeting and states that have members on the Aurora or Clear Roads boards will be able to send their representative.

Status:

- The successful event was held in September 2011.
- Aurora and Clear Roads will need to coordinate on sharing of event costs.

Approximate % Complete: >95 %

Barriers/Issues: None

Recommendations:
- X continue as planned
- ____ continue with modifications
- ____ discontinue

Additional Comments:

- This project was funded for $30,000 in FY 2011.
- Aurora, Clear Roads, PNS, SICOP and FHWA would be equal partners in developing the agenda for the multi-day meeting.
- Project Team: Tina Greenfield (champion), Dawn Gustafson, Tim Peters

Project Status Report

March 22, 2012

Project: 2011-02: RWIS Training Tool

Champion: Tina Greenfield, Iowa Department of Transportation

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

Status:

- This project is estimated to last 3 years.
- ***A draft scope/concept drawing was sent to the team for review.***
- Tina needs their comments so we can get the project going.
- ***A project mini-meeting has been scheduled for the March 2012 board meeting in Utah.***

Approximate % Complete: 10 %

Barriers/Issues: None

Recommendations:
- X continue as planned
- ____ continue with modifications
- ____ discontinue

Additional Comments:

- This project was funded for $200,000 in FY 2011.
- Project Team: Tina Greenfield (champion), Max Perchanok, Mike Kisse, Jack Stickel, Mike Adams

Project Status Report

February 1, 2012

Project: 2011-03: Benefit/Costs and Instruction for Migrating to Open RWIS

Champion: Tina Greenfield, Iowa Department of Transportation

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

Status:

- This project is new for FY 2011.
- The project team needs to schedule a call or meeting to discuss this effort.

Approximate % Complete: 5 %

Barriers/Issues: None

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

Additional Comments:

- ***This project was funded for $75,000 in FY 2011.***
- Project Team: Tina Greenfield (champion), Dawn Gustafson, Jason Norville, Jack Stickel, Mike Kisse, Travis Lutman

Project Status Report

February 1, 2012

Project: 2011-04: Study of MDSS Costs

Champion: Mike Adams, Wisconsin Department of Transportation

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

Status:

- ***This project was funded for $20,000.***
- A web survey will most likely be the first step under this effort.
- ***Mike Adams will be drafting questions as a starting point for this effort.***

Approximate % Complete: 5 %

Barriers/Issues: None

Recommendations:
- X continue as planned
- ____ continue with modifications
- ____ discontinue

Additional Comments:

- This project was funded for $20,000 in FY 2011.
- Project Team: Mike Adams (champion), Mike Kisse, Jason Norville, Sheldon Drobot

Project Status Report

December 13, 2011

Project: 2011-05: Funding Sources Identification

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

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

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

Status:

- This project will involve surveying the Aurora member agencies on the funding sources they use, how to tap into them, and the processes they use to secure the funding
- The resulting document would describe the funding sources, the approaches agencies used to tap into funding, and the process they used to secure funding.
- ***Jack Stickel noted using ISU as a resource to accomplish this project.***
- ***The resulting document would be posted on the Knowledge Base web site.***

Approximate % Complete: 5 %

Barriers/Issues: None

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

Additional Comments:

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

FY 2012 Discussion

1. ***Candidate H: Validate the Accuracy of Pavement Condition Predictions from Various Sources ($100,000)***

2. ***Candidate G: Improved Winter Severity Index / Winter Weather Severity Index, Phase 2 ($5,000)***

3. ***Candidate D: Cameras and Operational Impact of Remote Road Condition ($20,000)***

4. ***Candidate F: Communicating and Publicizing Road Weather and Operations Information to Decision Makers and Public Stakeholders ($30,000)***

5. ***Candidate A: Seasonal Weight Restrictions Demonstration ($250,000)***

We mentioned funding $5,000 for Leigh to participate if Clear Roads funds their own version of our ***Candidate I (Synthesis of Best Practices in Pass Operations)***.

Also, I had an interesting talk with Bob Younie last week. After having Paul Trombino present at the seminar a couple of weeks ago, I think Iowa could take advantage of some of his main areas of interest. He mentioned winter maintenance and weather quite a bit. We may want to talk with Clear Roads about this. We could combine the goals of one or both ***Candidates B (Revisiting Winter Road Condition Terminology) and C (Using Social Media in Winter Operations)*** into the fourth project above and try to work with Annette to make Iowa a testbed of using social media. I think the director may be supportive in this.

Finally, we may also want to consider meeting the goals of ***Candidate J (Make the Aurora Winter Severity Index Available to All)*** through the second project above. This would assume other agencies may want to fund their own access to the Accuweather index.