

Aurora Program Ongoing Project Status

April 9, 2010

FY 2000 through FY 2006

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

FY 2007

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

FY 2008

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

FY 2009

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

FY 2010

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

Project Status Report

April 7, 2010

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

Champion: Max Perchanok, Ontario Ministry of Transportation

Status:

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

Approximate % Complete: 60 %

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

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

Additional Comments:

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

Project Status Report

September 28, 2009

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

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: >95 %

Recommendations: continue as planned
 continue with modifications
 X discontinue

Additional Comments:

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

Project Status Report

December 2, 2009

Project: 2004-04: Winter Weather Severity Index Enhancements

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

Approximate % Complete: 90 %

Barriers/Issues: None.

Recommendations: continue as planned
 X continue with modifications
 discontinue

Additional Comments:

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

Project Status Report

September 28, 2009

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

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

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

Status:

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

Approximate % Complete: 5 %

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

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

Additional Comments:

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

Project Status Report

January 8, 2010

Project: 2005-02: RWIS Telecommunications Issues and Options

Champion: Dean Kernan, Illinois Department of Transportation

Status:

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

Approximate % Complete: >95 %

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

Additional Comments:

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

Project Status Report

August 5, 2009

Project: 2005-06: New Road Surface Condition Sensor

Champion: Dan Eriksson, Swedish Road Administration

Status:

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

Approximate % Complete: >95 %

Barriers/Issues: None

Recommendations: X continue as planned
 continue with modifications
 discontinue

Additional Comments:

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

Project Status Report

September 28, 2009

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

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 <http://www.clarusinitiative.org/regional.htm>.
- A project account was being set up to cover Clarus travel.

Approximate % Complete: 55 %

Barriers/Issues: None.

Recommendations: X continue as planned
 continue with modifications
 discontinue

Additional Comments:

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

Project Status Report

April 6, 2010

Project: 2006-08: Low Cost Mobile RWIS

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:

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

Approximate % Complete: 90 %

Barriers/Issues: None.

Recommendations: X continue as planned
 continue with modifications
 discontinue

Additional Comments:

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

Project Status Report

April 2, 2010

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

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

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

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

Status:

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

Approximate % Complete: 5 %

Barriers/Issues: Final Scope of Work for RFP

Recommendations: X continue as planned
 continue with modifications
 discontinue

Additional Comments:

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

Project Status Report

December 2, 2009

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

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

Status:

- Jeff Tilley is preparing a final report for presentation at the TRB show next June in Indianapolis.
- Jeff Tilley will forward a copy to Aurora when it is completed.
- Ohio DOT brought the RT3 unit back from North Dakota last week.
- A presentation on results will be made at the 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.
- UND had expressed some security concerns with sharing the extra data collected on this project. It was agreed that Jeff Tilley would gather this data and forward it on to Chris Albrecht where it could be accessible upon request.

Approximate % Complete: 90 %

Barriers/Issues: None.

Recommendations: X continue as planned
 continue with modifications
 discontinue

Additional Comments:

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

Project Status Report

September 28, 2009

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

Champion: Tina Greenfield, Iowa Department of Transportation

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

Status:

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

Approximate % Complete: 15 %

Barriers/Issues: None.

Recommendations: continue as planned
 X continue with modifications
 X discontinue

Additional Comments:

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

Project Status Report

April 7, 2010

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

Champion: Max Perchanok, Ontario Ministry of Transportation

Status:

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

Approximate % Complete: 60 % (Phase 2)

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

Recommendations: 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
- Project Team: Max Perchanok (champion), Sheldon Drobot, Jeff Tilley, Curt Pape, Mike Adams

Project Status Report

September 28, 2009

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

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:
 - 1) Ozone O3
 - 2) Nitrogen Dioxide O2
 - 3) Carbon Monoxide CO
 - 4) Volatile Organic Compounds VOC
 - 5) Carbon Dioxide CO2
 - 6) Sulphur Dioxide SO2
 - 7) Hydrogen Sulphide H2S
 - 8) Particulate PM10
 - 9) PM2.5

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

Approximate % Complete: 5 %

Barriers/Issues: Final scope of work for RFP

Recommendations: X continue as planned
 continue with modifications
 discontinue

Additional Comments:

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

Project Status Report

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: 20 %

Barriers/Issues: None

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

April 7, 2010

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

Champion: Ralph Patterson, Utah Department of Transportation

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

Status:

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

Approximate % Complete: >95 %

Barriers/Issues: None

Recommendations: X continue as planned
 continue with modifications
 discontinue

Additional Comments:

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

Project Status Report

April 8, 2010

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

Champion: Max Perchanok, Ontario Ministry of Transportation

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

Status:

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

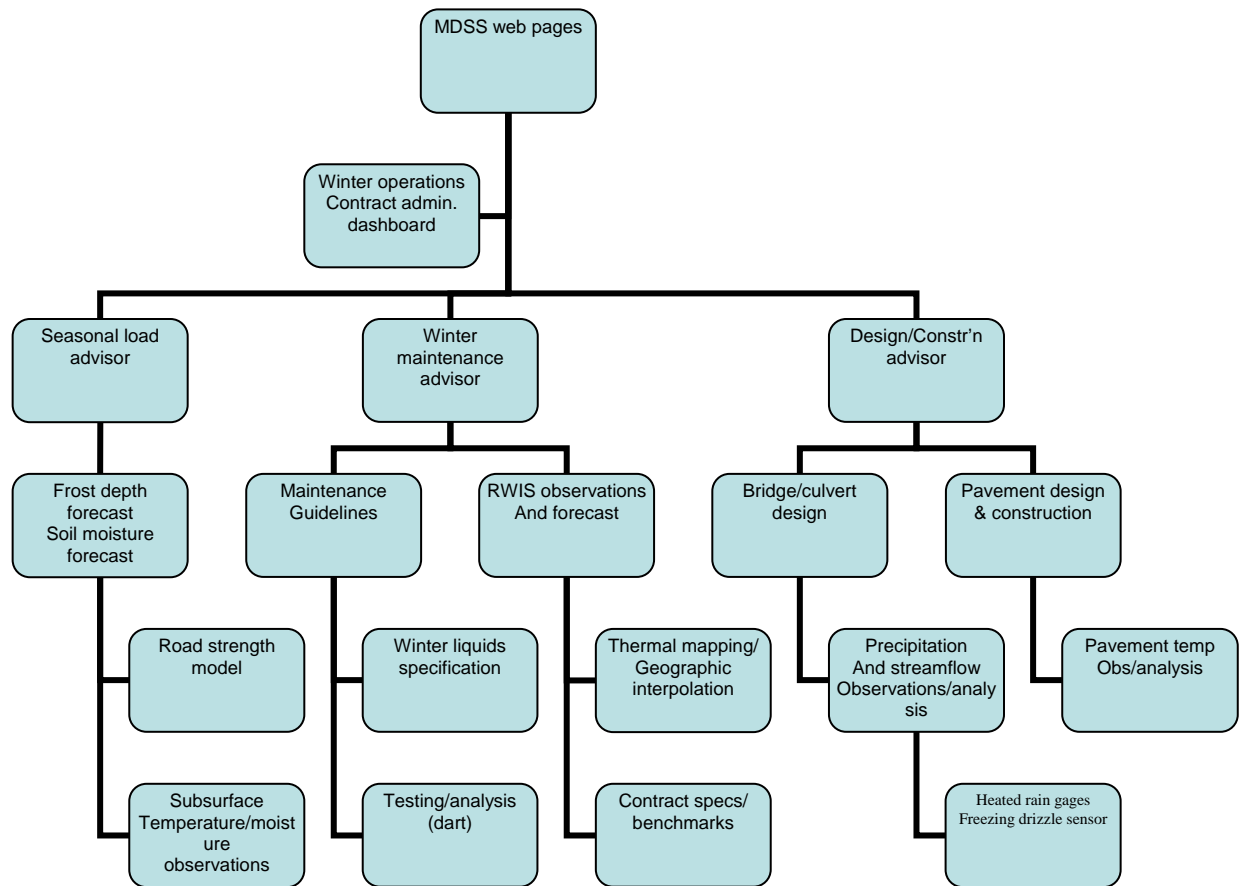
Approximate % Complete: 30 %

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

Recommendations: X continue as planned
 continue with modifications
 discontinue

Additional Comments:

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



Project Status Report

April 2, 2010

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

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: 5 %

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: Ralph Patterson (champion), Curt Pape, Jack Stickel, Dean Kernan, Joe Doherty

Project Status Report

April 9, 2009

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

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

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

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

Status:

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

Approximate % Complete: 15 %

Barriers/Issues: None

Recommendations: X continue as planned
 continue with modifications
 discontinue

Additional Comments:

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

Project Status Report

April 9, 2010

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

Champion: Dawn Gustafson, Michigan Department of Transportation

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

Status:

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

Approximate % Complete: 20 %

Barriers/Issues: None

Recommendations: 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

December 2, 2009

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

Champion: Ralph Patterson, Utah Department of Transportation

Objective: The two primary objectives of this project are the utilization of RWIS data within PPAES and the blending of PPAES products produced using different observation platforms.

Status:

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

Approximate % Complete: 5 %

Barriers/Issues: None

Recommendations: X continue as planned
 continue with modifications
 discontinue

Additional Comments:

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

Project Status Report

September 28, 2009

Project: 2009-06: Salinity Sensor Improvements and Development

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: <5 %

Barriers/Issues: None

Recommendations: X continue as planned
 continue with modifications
 discontinue

Additional Comments:

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

Project Status Report

April 2, 2010

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

Champion: Tina Greenfield, Iowa Department of Transportation

Status:

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

Approximate % Complete: 10 %

Barriers/Issues: None

Recommendations: 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, Mike Adams, Max Perchanok, Jeff Tilley

Project Status Report

February 15, 2010

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

Champion: Bill Hoffman, Nevada Department of Transportation

Status:

- This project is new.

Approximate % Complete: <5 %

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: Needs to be finalized

Project Status Report

April 8, 2010

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

Champion: Max Perchanok, Ontario Ministry of Transportation

Status:

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

Approximate % Complete: 5 %

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

Recommendations: X continue as planned
 continue with modifications
 discontinue

Additional Comments:

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

Project Status Report

February 15, 2010

Project: 2010-04: RWIS Sensor Density Grid

Champion: Kirk Carpenter, Indiana Department of Transportation

Status:

- This project is new for FY 2010.

Approximate % Complete: <5 %

Barriers/Issues: None

Recommendations: X continue as planned
 continue with modifications
 discontinue

Additional Comments:

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

Project Status Report

February 15, 2010

Project: 2010-05: Determining RPU and Sensor Failure

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

Status:

- This project is new.

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 2010
- Project Team: Needs to be finalized