



MINUTES

Clear Roads 2010 Technical Advisory Committee Summer Meeting:
Pooled Fund Project #TPF-5(218)

Tuesday - Thursday August 10-12, 2010
Hilton Grand Rapids Airport - (www.hilton.com) - Wolverine A and B

Attendees:

David Wieder, Colorado DOT	Tim Jackson, Missouri DOT	Monty Mills, Washington DOT
Annette Dunn, Iowa DOT	Caleb Dobbins, New Hampshire DOT	Mike Sproul, Wisconsin DOT
Tim Peters, Illinois DOT	Mike Lashmet, New York DOT	Cliff Spoonemore, Wyoming DOT
Dennis Belter, Indiana DOT	Mike Campbell, North Carolina	Rudy Persaud, FHWA – D.C.
Brian Burne, Maine DOT	Larry Gangl, North Dakota DOT	Leland Smithson, AASHTO
Paul Brown, Massachusetts DOT	Charles Goodhart, Pennsylvania DOT	John Klostermann, APWA
Tim Croze, Michigan DOT	Lynn Bernhard, Utah DOT	Dawn Gustafson, Aurora
Tom Peters, Minnesota DOT	Allen Williams, Virginia DOT	Colleen Bos, CTC & Assoc.

Presenters:

Lisa Ballard, Current Transportation Solutions	David Veneziano, WTI	Michelle Akin, WTI
	Laura Fay, WTI	Cam Kruse, Braun Intertec

Materials Distributed:

Agenda

- Clear Roads Budget Overview
- Clear Roads Administration Update
- Provider Evaluation Form
- State Winter Statistics Spreadsheet
- Roundtable Discussion: Winter Maintenance Budget Constraints
- Product Experience Feedback: 2006-2010
- City of Dubuque Snow and Ice Control Program Presentation
- AASHTO Winter Roadway Maintenance Computer-Based Training flyer
- Developing a Test Methodology that Correlates Laboratory Testing and Field Performance Presentation
- Development of Standardized Test Procedures for Carbide Insert Snowplow Blade Wear
- FHWA Road Weather Management Recent References and Resources
- Proposal for the Multiple Blade Plow Project
- Iowa DOT Cost Benefit Analysis Results
- Michigan State Report
- Minnesota State Report
- Utah State Report
- Indiana State Report
- Virginia State Report
- Maine State Report
- Iowa State Report
- Washington State Report

Clear Roads Business and Administration

Introductions and Meeting Objectives

Chairperson Paul Brown kicked off the meeting with introductions of all attendees and a review of objectives.

Introductions included some new faces:

- One new member joined Clear Roads: Charlie Goodhart from Pennsylvania DOT.
- Mike Campbell from North Carolina DOT attended as a guest of Clear Roads.
- Dawn Gustafson from MDOT represented Aurora at the Clear Roads meeting.
- Tim Peters from the Illinois DOT, Annette Dunn from the Iowa DOT and David Wieder from the Colorado DOT were attending their first Clear Roads meeting as new technical representatives for their states.

Tim Croze also welcomed the group to Michigan and shared some data on the state.

Clear Roads Budget

Colleen presented the Clear Roads budget including the including the income and expenses under both the Wisconsin-led and Minnesota-led pooled funds.

- There is significant funding available for new projects in 2011
- The remaining funds from the Wisconsin-led Clear Roads pooled fund TPF-5-(092) will be transferred to the current Minnesota-led pooled fund TPF-5(218) in the next few months.

CTC & Associates Update

Colleen reviewed CTC's activity in support of Clear Roads for 2010.

- CTC provides support for Information Services, Meeting Planning, Research Projects and Administrative activities.
- Due to the unprecedented number of projects closing in 2010 and the growth in members and meeting length, CTC's hours have been higher than anticipated.
- After some discussion, the Clear Roads members voted to increase the contact by up to \$10,000 in an exact amount to be determined by CTC and the Chairperson, Vice Chair and Technical Lead at MnDOT.
- Cliff, Paul, Mike and Tom will be involved in scoping out the next contract with CTC.

>>Action Items

- *Cliff Spoonemore, Paul Brown, Mike Sproul and Tom Peters:* Will work with CTC & Associates to scope out the next contract.

How Clear Roads is Growing

Paul Brown reviewed some issues related to the growth of Clear Roads and it's potential influence in many areas:

- Paul is planning an Open Architecture meeting with equipment vendors and other stakeholders to precede the Winter Meeting (February 1-3, 2011) in Virginia.
- PNS is also at a crossroads and there is some discussion of how PNS could fit into Clear Roads.
- The group scheduled the Summer 2011 meeting for the first week in August (August 2-4th, 2011).
- Allen Williams and Monty Mills agreed to serve on the 2011 Peer Exchange Planning Committee.
- Colleen will send out a note next week to ask for feedback on the meetings, so the group can try to make the best use of its time and address any logistical concerns that arise as it grows.

>>Action Items

- *CTC & Associates:* Will send out an email soliciting feedback on the meeting to help in planning the next meeting.

- *Allen Williams and Monty Mills*: Will serve on the planning committee for the 2011 Winter Maintenance Peer Exchange

Research Evaluation

Allen reviewed his draft Research Evaluation Form for Principal Investigators (PI) who work on Clear Roads projects.

- The group agreed that it would likely make sense to tailor some of the questions that are used for evaluation to the nature of the project.
- Clear Roads would also like to include these questions for evaluation in the RFP and/or contracts, so that the PI is aware of what they will be evaluated on up front.
- The group would like to track scores over time, so the information could be used in evaluating future proposals from PIs with whom Clear Roads has experience.
- The expectation is that the PI and Project Champion will get together on the phone and review the feedback.
- Clear Roads should probably have the MnDOT Attorney General review the form to get their input.

>>Action Items

- *Allen Williams*: Will finalize the format and develop some guidelines on how this will work.

Aurora Participation

Lynn Bernhard attended Aurora's spring meeting and reported the following:

- Aurora has a very specific, narrow focus and have made some real strides in RWIS technology.
- Lynn recommends that Clear Roads continue to send someone to the meetings, probably whoever is physically closest, rather than the same person all the time.
- Lynn also suggested sending Clear Roads information to the Canadian provinces to see if any of them are interested in joining Clear Roads.

Current Research Project Updates

Development of a Toolkit for Cost-benefit Analysis of Specific Winter Maintenance Practices, Equipment and Operations

Dave Veneziano reviewed the project and its goals and challenges as it approaches completion. The goal was to develop a cost-benefit analysis toolkit that would help winter maintenance professionals to communicate operational needs to accounting and other non-winter maintenance staff within state agencies. The toolkit will help provide the information Clear Roads technical representatives need to demonstrate the value of the materials and equipment to do their jobs effectively.

- Ten items were selected for analysis in the scope of the project.
- David reviewed the steps in the project: literature review, practitioner survey, analysis, developing the toolkit, providing training and developing implementation recommendations.
- The group reviewed issues regarding the on-going maintenance and training for the toolkit. Clear Roads will need to host the toolkit and keep it current.
- Lee Smithson suggested that it might be suitable for a CBT module to provide training or refresher training. There will be some education required to make sure that people can use the tool effectively and understand the terminology and economics.

Training for the Cost-benefit Analysis Toolkit

Lisa Ballard provided training and reviewed the development approach. It is a content management system using an open source platform. Lisa demoed the system and then guided the TAC through hands-on training.

She collected feedback on how to improve and upgrade the toolkit:

- A future phase will need to include prettier printing capabilities. People are pleased with the end report, though it does need to be in a format that can be more easily manipulated for presentation to managers.
- The tool will also need to run on more versions of internet browsers as many members were not able to use it. DOTs are not always on the latest versions of software and do not always give their staff the freedom to choose any browser or version they like.

Correlating Lab Testing and Field Performance for Deicing and Anti-icing Chemicals (Phase I)

Laura Fay and Michelle Akin presented the results of this project, which is almost complete. The goal is to develop a tool or method to evaluate the performance and friction coefficient of de-icing chemicals and correlate that with actual roadway performance. This first phase included a literature search and interviews with experts. The deliverables include a final report with recommendations on how to proceed with future phases.

Some key issues highlighted include:

- Both lab and field studies have been conducted, but it's hard to correlate between lab and field, due to additional variables in the field.
 - Currently, there are no lab tests that directly correlate. The only lab and field testing correlation project identified in the literature search found that there was not really a correlation.
 - It will be critical to the success of the next phases of the project to define "deicer performance."
 - There is little research on field-testing methodologies, although the Clear Roads Deicer Testing Guide is useful and might be expanded for this purpose.
 - Although there are many pieces of equipment available to measure friction, there are not many examples of lab to field correlation.
 - WTI reviewed the use of friction measurement in the aviation industry. Overall it appears that friction is getting downplayed in the aviation industry and going another direction, although their methods may still have more applicability for highways.
 - WTI identified relevant parameters for both lab and field testing such as temperature (air and pavement), relative humidity, traffic, pavement type, melting rate of deicers, uniform ice/snow pack.
 - The project recommendations include guidance on testing methodologies, statistical analysis using available technology, and managing precipitation (snow/ice pack) and uniform tracking. They also included budget recommendations.

Development of Standardized Test Procedures for Carbide Insert Snowplow Blade Wear

Cam Kruse presented the results of this project, which is complete and nearing close out. The project looked at the performance of snowplow blades (something DOTs spend a great deal of money on). The goal was to identify tests that could be used by an independent testing laboratory to predict the performance of these blades.

Some key issues highlighted include:

- There are many factors that affect snowplow blade wear and this study focused on what causes inserts to fail: abrasion and fracturing.
- They conducted field testing with Utah DOT and looked at three blade sets, which were tested for 300 miles each.
- Braun also conducted lab testing to correlate with the field testing, picking tests that could predict life expectancy, were easy to use, easy to implement and were not too costly.
- They identified lab tests that did demonstrate that inserts showing flaws in the lab also had the poorest performance in the field.
- Their recommendations include developing a national standard for everyone to use, so that manufacturers can focus on making one type of carbide blade and shape.

- Braun recommended a purchasing approval framework and specification which has the potential to save DOTs a lot of money.

The group discussed implementation and how to enforce these standards of quality. Braun's standard specification could be used by all states to order blades, although Clear Roads would like more precise thresholds specified for the quality levels.

- Lynn Bernhard, Cliff Spoonmore, Tim Croze, Brian Burne and Caleb Dobbins agreed to finalize the Braun specification for use by the Clear Roads states.
- Clear Roads will need to take the specification and circulate it as the Clear Roads standard, presenting it to AASHTO, APWA, etc. to educate all the stakeholders.
- Braun also strongly recommended that operators get training on best practices and that DOTs hold them accountable for following those best practices.
- Another phase may be needed to capture best practices and translate that into training, although Penn DOT already does this, so Clear Roads may be able to follow their model.
- If another phase is needed it can be proposed for 2011 funding at the Winter meeting.

>>Action Items

- *Lynn Bernhard, Cliff Spoonmore, Tim Croze, Brian Burne and Caleb Dobbins:* Will finalize the specification for use by Clear Roads and presentation to other stakeholders.

Identifying the Parameters for Effective Implementation of Liquid-only Plow Routes

Dennis Belter and Allen Williams provided an update on this project and described the goal of looking at the use of liquid-only routes for snow and ice removal, focusing on during-storm direct liquid applications.

- The PI has engaged a lot of experts on viewpoints of how to do liquid routes.
- The results of this project should match up the tool/method with the right circumstances.
- Early results showing savings in materials and labor in Iowa.

Best Management Practices for Reducing Corrosion

The goal of this project, which was selected for 2010 funding was to develop a guide or a manual (of techniques and materials) that all snow maintenance agencies could follow to reduce corrosion and make equipment last longer.

- This was a hot topic at the 2009 Peer Exchange Funded project, but the subcommittee found out that Alaska University Transportation Center was already working with WTI on the same type of project, so the subcommittee is collaborating with them.
- The project will produce a best practices guide as well as a literature search and survey.
- Clear Roads offered to contribute funding but it may not be needed.
- WTI is assessing how much money is necessary for Phase 2 of the project and Clear Roads will wait to hear the outcome before determining what to do with the funds that had been assigned to this project.

Product Experience Survey Results

Colleen presented the product experience feedback results from the 2009-2010 season. Fewer results were received this year and Colleen wanted to ensure the group is still interested in the project.

- Paul suggested that the project be expanded to a booklet that includes innovative practices from each state along with the product experiences.
- The group agreed that CTC should develop a template that states could use to provide some basic information on their innovations and perhaps a picture.
- CTC will work with Paul Brown to scope out the approach to this booklet.

>>Action Items

- *CTC & Associates and Paul Brown:* Will work together to develop an approach to sharing product experiences as well as new innovations by Clear Roads members.

State DOT Winter Operations Information Spreadsheet

Tim Croze shared the latest version of the State Winter Operations Spreadsheet.

- Clear Roads would like CTC to work on how best to format the information.
- There was also a suggestion to gather all possible winter maintenance policies and procedures and put them on Aurora's wiki site.
- Some changes were suggested to column titles to make them clearer, such as Snowfall Range for FYI 10 in place of Average Snowfall.
- The group would like to add some additional data from this spreadsheet to Washington DOTs salt map and then post it on the Clear Roads Web site. Tim and Monty Mills agreed to follow up on whether this information could be added to the salt map.

>>Action Items

- *CTC & Associates:* Will work to put the spreadsheet in a more print-friendly format.
- *Tim Croze and Monty Mills:* Will follow up on putting some of the data in a format similar to the Salt Map

Implementing Completed Projects

Implementing Results of Developing and Evaluating Safe Winter Driving Messages

Mike reviewed the available deliverables, which are all posted on the Clear Roads Web site.

- Clear Roads members should make sure they point their PIO's to these resources.
- Colleen will follow up with a reminder about that once the materials are transferred to the public portion of the Web site.
- It will be up to each state to decide how to distribute the materials.

Implementing Results of the Interface Specifications Project

Tim Jackson reviewed the recommendations for implementation of the Final Report for the interface specifications project. The group discussed the best way to implement the specifications that have been developed.

- There seem to be some challenges to implementing the specifications, based on the reactions from the people who buy equipment, but Clear Roads is committed to finding a way to address these challenges.
- Clear Roads needs to find a way to help each state adapt the specifications to their needs or find someone or multiple people who can help with that process.
- Clear Roads will also engage the equipment manufacturers at the Virginia meeting, but it's important that the members all agree on the solution that Clear Roads is requesting of the manufacturers.
- There was some discussion of whether the members want the Thompson specification or some type of a wireless solution, although eventually the members seemed to agree that the critical piece is the Thompson specification regardless of whether the solution is wired or wireless.
- The key issue is getting the data out of the trucks, not necessarily complete compatibility between different manufacturers. Clear Roads would like compatible data output.
- Clear Roads needs to identify experts of real technical competence to help support them as they engage in discussions with equipment manufacturers.
- Clear Roads needs to identify experts who can join a future conference call to review the needs and ideas and help develop the correct questions to ask the manufacturers in January.
- A subcommittee led by Paul Brown and including Charlie Goodhart, Allen Williams, Brian Burne, David Wieder, and Mike Lashmet will work to identify experts and work with them to ensure they are able to ask the correct questions with the manufacturers in January.
- Clear Roads should also include Paul Pisano (FHWA) in these discussions.

>>Action Items

- *Paul Brown, Allen Williams, Charlie Goodhart, Allen Williams, Brian Burne, David Wieder and Mike Lashmet:* Will work to identify experts and ensure that Clear Roads understands what it needs to request of the manufacturers at the meeting in January.
- *CTC & Associates:* Will follow up with Paul Brown to coordinate an initial teleconference and ensure the right people are included.

Implementing Results and Next Steps with the Development of Standardized Test Procedures for Evaluating Deicing Chemicals

Dennis Belter reviewed the project and its results and what the options are for Clear Roads next steps.

- Clear Roads can post the final report without additional follow up; conduct the round robin testing; or consider waiting to see what comes out of the Correlating Deicing Lab and Field Testing project to see if additional steps are appropriate.
- The group also discussed whether to add a note to the Web site indicating there is additional research and highlighting some of the issues with the initial results or not.
- The group agreed to post the Final Report without any additional notation and await further results on the subject of correlating lab testing and field testing for deicers before doing anything else with the results of this project.

>>Action Items

- *CTC & Associates:* Will post the final report on the Web site.

Implementing Results of the Cost-benefit Analysis Toolkit

Paul Brown led the discussion on how to implement the results of the first phase of this project.

- Paul plans to propose a second phase for the project to clean up some of the issues with format and browser compatibility and to expand the tool.

>>Action Items

- *Paul Brown:* Will develop a Phase 2 proposal for consideration at the January 2011 meeting.

Partner Project Updates

Winter Maintenance Peer Exchange 2011 Update

Lee Smithson reviewed the past goals of the 2007 and 2009 Winter Maintenance Peer Exchange as and provided an update on the 2011 Peer Exchange.

- Bozeman, Montana has been selected as the location of the 2011 Peer Exchange.
 - It will be held towards the end of August.
 - Clear Roads will need to identify two or three people to serve on the planning committee.

Computer-based Training Update

Lee Smithson provided an update on the CBT status. He handed out the AASHTO Winter Roadway Maintenance Computer-based Training handout.

- Currently AASHTO is working to make the CBT SQRM compliant.
- They are also following up on the request from Clear Roads and Aurora to make the CBT Web-based.

Snowplow Design Project

Paul Brown presented an estimate requested by the Iowa DOT to produce a Final Report for the multiple blade plow project, which had been led by the Iowa DOT, but funded in part by Clear Roads member states.

- The group would like to have a PowerPoint accompany the final report.
- Clear Roads voted to approve funding for the final report and then vote via email on approval for the PowerPoint.

- Clear Roads would also like to have some voice in reviewing the deliverables.
- Colleen needs to find out how the contracting would work for this, for example through Clear Roads, through the Iowa DOT or through MnDOT.

>>Action Items

- *CTC & Associates:* Will develop a revised estimate to include a PowerPoint and review it with Clear Roads via email along with the contracting options.

Partner Program Updates

City of Dubuque Snow and Ice Control Program

John Klosterman presented on the City of Dubuque's Snow and Ice Control program. Some highlights include:

- They have a \$1.28 million snow and ice budget.
- Dubuque is the oldest city in Iowa, hence narrower streets, which present winter maintenance challenges.
- They have an aggressive anti-icing program. For example, deicing and plowing for all city streets to bare pavement.
- They use salt brine to anti-ice the trouble spots.
- Current initiatives include their AVL/GPS program and how to get it into a web-based system.

Update on APWA

John also presented on the current activities of the American Public Works Association as well.

- John is a member of APWA; Mark DeVries is the winter maintenance chair for the APWA
- The APWA appreciates the chance to share information on Clear Roads research with the cities and counties.
- 2011 Snow Conference is in April in Spokane and will be a joint conference with PNS and includes a big vendor show.
- The Snow Fighters Certification is now an initiative for the 2011 conference. It will be one day of training with multiple sessions and testing afterward. In 2011 they will also work on moving the certification to a Web-based system.

Update on Aurora

Dawn Gustafson shared an update on the mission and activities of the Aurora pooled fund.

- There are fourteen US members and three international members in Aurora.
- Aurora has a number of affiliates and partners who attend their meetings once every two years.
- They have 26 ongoing projects, several of which relate to 2007 and 2009 Peer Exchange projects.

FHWA Update

Rudy Persaud provided an update on the FHWA's Road Weather Management Program.

Member State Information Sharing

State Report – Minnesota

Tom Peters shared an overview of his agency's activity for the last year. Here are a few highlights:

- Organized into 8 districts and operates in a decentralized mode.
 - Trying out a number of salt alternatives, such as Ag By-Product for example, and using mobile blending stations for salt or other blends.
 - Testing zero velocity spreaders to limit materials on the roadway and also testing the tow plow.
 - Encountering some challenges with the cost of implementing the results of their research.

- In the coming year, Mn/DOT will focus on Snow & Ice Training, future expansion of MDSS/AVL, and will continue to seek out new ideas to improve maintenance operations.

State Report - Wyoming

Cliff Spoonemore shared an overview of his agency's activity for the last year.

Here are a few highlights:

- Wyoming doesn't use as much salt as other states and instead mix salt and sand.
- The snow fences are working well, except where landowners won't let them be built.
- One of Wyoming's challenges is that it has very tight operations with no back-up or spare trucks available.
- They recently switched to variable speed limits on the interstate.
- For the upcoming year, they have ordered salt brine makers, although they haven't gotten them yet.

State Report – Utah

Lynn Bernhard shared an overview of his agency's activity for the last year.

Here are a few highlights:

- UDOT has had successes with roadview cameras, automatic tire chains, and increased use of tow plows.
- Challenges have included an Increase in lane miles and a decrease staff, as well as higher material costs.
- The challenges have resulted in decreasing level of service and quality of pavement.

State Report - Michigan

Tim Croze shared an overview of his agency's activity for the last year.

Here are a few highlights:

- Winter expenses were down this year, because many locations had less snow.
- MDOT is responsible for 32,500 lane miles, but 25,000 of them are maintained under local contract.
- One new initiative is RWIS. They currently have twelve RWIS stations and are installing more.
- They tested some new products, such as the Monroe salt/slurry generator, calibration scales, ceramic blades and Clear Lane.
- The calibration scales were well-received and MDOT feels this was a great value. As a result, more regions will be purchasing them.

State Report - Indiana

Dennis Belter shared an overview of his agency's activity for the last year.

Here are a few highlights:

- Indiana has a number of new initiatives, including data driven decision-making, which has resulted in a lot of new reports on winter maintenance activities (overtime, diesel usage, salt usage, etc).
- They have continued implementing MDSS and have seen success in savings, although some issues with equipment, buy-in and transition.
- They are also implementing a computerized routing system for snowplow routes.

State Report - Virginia

Allen Williams shared an overview of his agency's activity for the last year.

Here are a few highlights:

- It was an especially hard winter in Virginia with record snow falls in December and one storm that left many people stranded.
- In 2007, Virginia had an initiative involving Turnkey Asset Management Contracts for all maintenance, and there have been significant issues with the approach. For example they issued twenty-two non-performance notices between December 2007 and February 2010. For the future, they are debating whether to do bundled TAMS contracts or do asset-specific contracts.
- For 2010-11 VDOT will manage snow removal and individual contractors will be employed and managed by VDOT during significant events.
- VDOT's Lesson Learned is that you can't use performance-based contracts for emergency services.
- A new initiative in the coming year will be to use Twitter, You Tube and the VDOT Web site to get road and weather information out to the public.

State Report – Maine

Brian Burne shared an overview of his agency's activity for the last year.

Here are a few highlights:

- Maine is doing better with salt prices, because there is some additional competition with new vendors in some regions.
- Some recent initiatives include the Tri-state plow blade contract with Vermont and New Hampshire, expanding the use of variable speed signs, and implementing the Viking Cives Underbody Springtooth Plow.
- Maine continued to refine LOS, work with tow plows, implement modified hoppers (retrofitted with tanks and belts and a new spreading system for slurry-type units), and make a Compu-spread to Cirus transition (ground speed control spreaders).
- Future efforts will include radar-based performance management based and also redrafting the snow fighter manual.

State Report – Iowa

Annette Dunn shared an overview of his agency's activity for the last year.

Here are a few highlights:

- It was a colder and wetter winter than normal this resulted in higher than average resource usage.
- Iowa's fleet is aging overall. Their target life is 15 years, but they are averaging 20 years now, which leads to more repairs.
- They are continuing to invest in RWIS.
- Many early retirements are resulting in staffing shortages.
- The current focus on innovations includes GPS/AVL investment, Right of Way Snow fences, Thermal Mapping, and others.
- Iowa completed a cost-benefit analysis that shows significant savings from the GPS/AVL.
- Their goals for the coming season include removing more snow in a single pass with the use of tow plows, flexible-edge plow blades, multi-blade plows, etc.

State Report - Washington

Monty Mills shared an overview of his agency's activity for the last year, although due to being short on time, he focused on Washington's use of GPS/AVL:

- They originally had a focus on material usage and road conditions.
- They are starting to add inventory supplies.
- Road surface condition and sky condition are manual inputs, but everything else comes in by sensor.
- They are looking at adding a new integrated map interface with the elements they currently collect plus traffic conditions.

- 1/3 of their fleet is equipped with GPS/AVL at this point.

Hot Button Discussion – Maintenance Budget Constraints

The TAC had agreed last winter to discuss budget constraints. Tim Croze had prepared questions in advance and guided the discussion.

The discussion focused on the following:

- Every state has been affected by budget constraints that have forced them to reduce levels of service on routine maintenance.
- States have many examples of reduced levels of service such as not picking up dead animals, spending less time on lower volume roads, and reducing mowing.
- Several states mentioned closing rest areas, which can result in public outcry. Maine noted that they selected which rest areas to close very carefully to minimize impact to the travelling public.
- All the states noted concerns about the long-term impact of reducing maintenance and Pennsylvania pointed out that it highlights the need for a systematic approach to pavement asset management.
- Michigan shared that their regional budgeting model means that counties with less snow have more money for non-winter maintenance and there is a resulting imbalance.
- Utah noted that in order to demonstrate the meaning of the reduced LOS they documented the number of deficient signs so people can track the true impact.
- Several states such as Colorado and Michigan have been able to utilize local media outlets to get the message out regarding the need for reducing levels of service. Michigan felt this helped in reducing complaints.
- Most states felt the bigger communication challenge is getting the maintenance staff to embrace the reduced LOS, because they take pride in doing a good job.
- States have used many strategies to deal with the reduced funding for maintenance staff:
 - Utah legislated a no overtime policy, which has been very strict.
 - Maine has worked to set up rotating shifts and to reclassify crews to increase the number of fleet staff available for rotations.
- A few states (Wisconsin and Iowa) reported that they were able to demonstrate the need for additional funding based on weather severity and were successful.
- All the states seemed to agree that safety is the key criteria for determining whether maintenance was necessary or not.