

## 2013 Winter Maintenance Peer Exchange Research Needs Statements

Progress Updated to September 2013. Questions or update information can be directed to Lee Smithson, 515-239-1519 or leland.smithson@dot.iowa.gov

Rank	Short Title	Number of Votes	Problem Statement	Research Group	Progress to Date
	<b>Maintenance consideration as part of Context Sensitive Design</b>		The current definition of Context Sensitive Design in the AASHTO Greenbook should be expanded so that it addresses ease of maintenance as part of sustainability. Designs should be practical and maintainable in all seasons.	SICOP	This could start with a literature review and documentation of best practices but probably needs to go further such as a manual that explains exceptions to the Greenbook and why they are needed. Other factors that need further exploration are privatization and how this affects communication between designers and maintainers.
2	<b>True costs of a level of service</b>		Look at the true costs of a level of service policy. How are your agency costs affected by temporary employees and how do training needs, consistency and other factors fit in? Tools are needed to help customers, politicians and others understand the policy and also show the impacts of not adhering to the policy during severe events. Are there adequate materials available for outreach to commercial vehicles and the traveling public. This should include a synthesis on what drives performance measures and how to determine factors such as storm duration.	SICOP	
3	<b>Information availability and delivery</b>		Evaluate information availability and delivery, determine how much is enough and what is too much. This includes reports, equipment and materials. How to design and implement a policy to show the proper type, amount and level of detail of information needed by different stakeholders so everyone has enough information to make an informed decision without taking excessive time or adding to their confusion.	SICOP	
4	<b>National standards for traction devices</b>		Evaluate information available for traction control devices and determine if this is something that can be administered by US DOT similar to the tire certification process.	SICOP	
5	<b>Limits for hours of vehicle operator service</b>		Explore the current trend to further limit the hours of service of commercial vehicle operators while at the same time the general public is working longer hours. How does fatigue, distraction and skill level between the groups affect safety of both. This also affects the commercial operators hired by contractors who work for DOT's. They may be able to plow snow all weekend but this time must come off the hours they are available to do other commercial operations afterwards.	SICOP	
6	<b>EPA MS4 requirements</b>		How do we encourage someone (AASHTO or FHWA or US DOT) to become involved in this so the result is manageable? Testing requirements are a major factor which will affect our ability to meet these requirements.	SICOP and Clear Roads	
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1	<b>Review and Application of Pavement Forecast Models</b>	N/A	This effort would look at past experience of various agencies with using the available pavement forecast models or virtual RWIS (Metro, SnowTherm, FAST, etc.). The application of the spring load restrictions model, which Aurora has already undertaken, is also a possible approach. This effort could look at 2 or 3 mathematical or atmospheric forecast models and should consider differences in the pavement type and structure/typical sections (asphalt vs. concrete, thickness, sub-base type or thickness, elevation, bridges, etc.). Specifically, research could take available pavement forecast models and review them head to head to see what works best. Ultimately, the goal of this research would be to improve the pavement forecast models.	Aurora	Being considered in next Aurora funding cycle. Tina Greenfield, Max Perchanok, and Joe Doherty volunteered to further develop this proposal with Chris Albrecht.
2	<b>Review of Alternate Power Supplies</b>	N/A	This effort would involve a small-scale state-of-the-practice review of available "off the grid" power options for RWIS operating in remote areas. These options would include fuel cells, thermoelectric generators, solar, wind, etc. It was also noted that the overall life-cycle cost, including maintenance and overall life span, would need to be considered.	Aurora	Being considered in next Aurora funding cycle. Jack Stickel volunteered to further develop this research proposal with Chris Albrecht.
3	<b>Verification of Alternative Precipitation Measurement Sensors</b>	N/A	This effort would look at what types of precipitation sensors are available and their capabilities (ratebased, presence, water equivalent, or type). The group agreed that this effort would be a smallscale technology review of about \$25,000, with possible field testing later.	Aurora	Being considered in next Aurora funding cycle. Jack Stickel, Max Perchanok, and Jeff Williams volunteered to further develop this proposal.
4	<b>Maximizing the Use of Mobile Sensors on Various Vehicle Types</b>	N/A	This involves evaluating the use of the available (Vaisala, Boschung, etc.) mobile weather sensors in regards to vehicle type and placement. Overall, the precision, accuracy, survivability, placement, etc. will be noted, and this research should determine if it is possible to accurately measure various weather parameters from a snow plow or patrol truck. Dawn Gustafson also noted that an effort getting underway this winter in Michigan could be a good basis for this proposal.	Aurora	Being considered in next Aurora funding cycle. Dawn, Mike Adams, Tina Greenfield, Max Perchanok, and Sheldon Drobot volunteered to further develop this proposal.
5	<b>Quality Checking of AVL Data</b>	N/A	This would focus on ways to quality check AVL data to ensure useable data is obtained. The effort could involve a survey of agencies utilizing AVL and see what their experiences are in regards to communication, sensors, data error, etc. The use of past data sets, rather than new data collection, would also be possible in this analysis.	Aurora / Clear Roads	Being considered in next Aurora funding cycle. Dawn Gustafson, Mike Adams, Curt Pape, Max Perchanok, and Jimmy White volunteered to further develop this proposal. Clear Roads would need to be kept in the loop on this project, if funded.
6	<b>MDSS Products and Procurement Guidance</b>	N/A	This project would provide additional funding (of about \$20,000) for the scope of Aurora Project 2012-01. This additional funding would be used to survey various agencies on what MDSS products (Meridian, FHWA Schneider, Vaisala, Boschung, etc.) they have used and what the perceived capabilities of each are. The deliverable for this effort would produce a matrix of features of each product that could be used in procurement of the services/products.	Aurora	Being considered in next Aurora funding cycle. Tina Greenfield, Max Perchanok, and Joe Doherty volunteered to further develop this proposal.
	<b>MDSS Truck Communications</b>	N/A	How do we get around the MDSS patent to provide communications to trucks? Can you put MDSS on a truck? Do you hire a patent lawyer to determine what is possible?	Clear Roads	N/A

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1	Video Training of Proper Techniques for Plowing and Maintaining Different Types of Interchanges	14	Best practices and procedures for how best to plow roundabouts and other types of interchanges. Include tow plows as well.	Clear Roads	Clear Roads funded this project in 2014.
2	Standard Road Condition Metrics/ Descriptions for Snow and Ice (include acceptable time lag)	13	Consistent terminology/ nationwide standards for performance metrics, so things are reported in a standardized way that allowed better national comparisons. I80 and I95 and Northwest Passage might have some initial work. Instrumentation will help take the subjectivity out of these descriptions. There will always be concerns with lag, although instrumentation will also help with this. Consistency across boundaries is a core issue for drivers. National training may be a related issue.	Clear Roads/ SICOP	Clear Roads funded this project in 2014.
3	Synthesis/ Best Practices/ Lessons Learned of Salt Brine Production according to Budget and Needs/ How to stage	11	QA/QC; storage considerations; do you need a brine maker; can you make your own, etc. Looking at brine application equipment - a comparative survey.	Clear Roads	PennDOT has a study underway to address this.
4	Synthesis/ Database on GPS/AVL Equipment	10	Maybe a simple survey on price, performance, service, etc. A clearinghouse of information about GPS/AVL equipment. Small-scale consumer's report on GPS/AVL.	Clear Roads	Clear Roads funded this project in 2014.
4	Best Methods and Practices for Sleet and Ice Storm Management	10	Best practices for restoring traction after the events; include forecasting.	Clear Roads	This project was proposed, but not selected for 2014 funding. It may be considered again in 2015.
6	Effects of Weight on Snowplow Trucks	9	Impact of add-on equipment to the structure of the truck and weight limits (plows, materials, etc.). Plow vehicles and bridge restrictions also factor into this. Horsepower is another variable. Route planning is a factor.	Clear Roads	This project was proposed, but not selected for 2014 funding. It may be considered again in 2015.
6	Synthesis of Marketing Innovative Techniques to Management	9	Looking at techniques to market ideas with in your DOT to the management level.	Aurora	
8	Synthesis of Best Practices in Dual/Multi-Purpose Snow and Ice Vehicles/ Equipment	7	Some agencies use low-profile trucks for landscaping in the summer, and also plowing snow in the winter. Multi-purpose trucks could be a good way to save fleet dollars.	Clear Roads	This project was proposed, but not selected for 2014 funding. It may be considered again in 2015.
8	MAP-21 Impacts on Winter Operations	7	How do we respond as winter managers to MAP-21.	SICOP/ Clear Roads	
10	Fluid Dynamic Flow of Snow Off of Snow Plows/ Improved Snowplow Design	4	Keeping snow off the windshield as the plow operates. This is looking for an improved snowplow design.	TRB	
11	Synthesis of Regional Collaboration in Transportation and Regional Transitions	3	Establishing shared regional goals and measures and LOS. Tollways with big budgets get a lot of salt and are maintained to another standard. Recommendations for border transitions.	SICOP	
12	Nationwide Route Segmentation for MDSS	2	Inputs for the MDSS for your road network. Help get people started with MDSS and also contribute to national efforts championed by NCAR.	Aurora	
12	Nationwide Minimum Standard for Maintenance	2	U.S. has no minimum maintenance standards and some countries do. Whereas if you hire contractors, they are given a minimum standard. Synthesis on other nations standards.	SICOP	
12	Looking at Alternative Fuels as Best Practices in Snow and Ice Equipment	2	A study of alternative fuels.	unassigned	
15	Tracking Snow Removal Progress with Remote Sensing	1	Apply to snowstorms what we already apply to hurricanes. Want to see when the traffic gets going again.	Aurora	
15	"Better" Management Practices for Environmental Impacts	1	Better management practices; out of the box ideas for environmental optimization.	unassigned	
17	Outreach to Others (such as parking lots, local roads)	0	Getting parking lots and all kinds of other segments (local roads) educated about the same environmental concerns as the DOT. Outreach on sensible salting.	unassigned	
17	National Staffing and Equipment Map	0	Like the salt map, but with all the standard stats.	unassigned	Tim Croze (Michigan DOT) was gathering this data and Lynn Bernhard (Utah DOT) is willing to continue the project.