

2015 National Winter Maintenance Peer Exchange – Minneapolis, MN
 Breakout Sessions Problem Statements

There were four concurrent breakout sessions each lead by a facilitator. The objective for each session was to discuss barriers to implementation for their topics, and research opportunities to address those barriers. The following are a listing of the problem statements based on the discussion during the breakouts. These problem statements can be utilized and refined into research need statements.

Breakout A: Materials, Sustainability, and Environment

No.	Problem Statement
1	<p>Identify and study the interrelationships between the Level of Service, storm severity, benefits & costs, performance measures, and other operational practices represented in a systems approach to winter maintenance. In order to take a systems approach to winter maintenance the various elements must be identified and their interrelationships understood.</p>
2	<p>Best Management Practices for material application accountability. Even with spreader calibration and other safeguards, accountability regarding material applications is imperative, particularly when dealing with regulatory agencies.</p>
3	<p>Study the role of liquid chemical use in reducing overall utilization of chemicals. Initial studies of anti-icing and the use of liquid chemicals indicated that chemical use could be reduced. Liquids use during deicing operations applied directly or by pre-wetting solids could also reduce total chemical use. Is this the case in practice? Guidelines for liquid chemical use would be helpful to agencies implementing a program of liquid chemical use.</p>
4	<p>Study to identify the complexities of winter Levels of Service. Defining Levels of Service for winter maintenance represents a complex interaction between political policy, environmental impact, and agency cost and available resources. Agencies that consistently over or under perform with respect to their established LOS may create unintended consequences.</p>
5	<p>Utilize the Capability Maturity Model evaluate the use and advancement of MDSS. Various DOTs are utilizing MDSS at a variety of levels. Utilizing the Capability Maturity Model is a way to quantify how robust and engrained the MDSS is within the DOT culture, which spans political /policy through to field acceptance.</p>
6	<p>Case studies of the application of weather responsive traffic management to improve mobility during winter events. Weather responsive traffic management programs can improve mobility during winter events and help facilitate the winter maintenance response. Documenting case studies will help agencies when considering implementation projects.</p>
7	<p>Develop a socioeconomic model for winter service. Understanding the socioeconomic costs of winter maintenance is a crucial element in developing a sustainable program. It can also identify benefits of winter maintenance for other modes.</p>

8	Synthesis of Storm Severity Indices and their uses in a program of winter maintenance. Understanding the severity of storms is an important element to put agency response in context.
9	Study multimodal winter maintenance issues. Communities are becoming keener on having multimodal transportation opportunities available during winter events. Agencies have to include response in their snow plans and level of service discussions. What are the impacts of pedestrians, cyclists, light rail, and modal interface facilities having on agencies during winter events and how are they dealing with it?
10	Guidelines for developing a Salt Management Plan. Environmental regulation in the form storm water runoff and other National and State regulations are raising salt management issues. Developing guidelines to help agencies create a salt management plan will help them understand the breadth of the issues and provide tools to help with implementing mitigation.

Breakout B: Equipment, Operations, and Tactics

11	Guide to determine spreader equipment reliability, calibration, and verification Document best practices in a guide to determine spreader equipment reliability with respect to calibration and its ability to remain in calibration throughout the winter.
12	Case studies to determine the most effective utilization for AVL systems for both internal and external uses. Many agencies are utilizing AVL but might not be maximizing the use of the technology.
13	Evaluate the effectiveness of fine-grained salts ground at the spreader. Is fine-grained salt ground on the spreader more effective or efficient than delivered fine-grained salt or liquid salt brine for various anti-icing or deicing applications?
14	Best practices for equipment preventative maintenance during winter operations. During winter operations performing preventative maintenance on the fleet often comes into conflict with the need for the equipment to be in service doing winter maintenance. How do agencies balance the down time for preventative maintenance with the pressure to keep the fleet in service?
15	Comparison of winter maintenance equipment procurement methods. DOT's are utilizing a variety of methods to procure winter maintenance equipment; lowest initial purchase price, lowest life cycle cost, lease-buy back, just to name a few. In many cases the purchase method is dictated by local procurement rules and regulations. Understanding how the various methods evolved and comparing these various methods with respect to fleet reliability and cost and will help determine options and opportunities for DOT's.
16	Evaluate spreading equipment to determine if they can reliability apply anti-icing and deicing materials at the target application rates. With the pressure to optimize the utilization of anti-icing and deicing chemicals and reduce the amount of abrasives (particularly in non-attainment areas) can the current spreaders (auger and chain-drag types) reliably achieve the target application rates?

Breakout C: Strategies, Workforce, and Public Relations

17	<p>Literature search of snow plow route planning. Several studies and research papers have been published regarding route planning. Even though snowplow routes have developed over many years of experience there may be opportunities to provide optimization based on new equipment capabilities and material effectiveness.</p>
18	<p>Develop a guide or tool to capture winter maintenance costs and benefits. Each element of the winter maintenance operation should have a well-defined way to describe and capture costs. This is critical in calculating benefits and costs and measuring operational efficiencies.</p>
19	<p>Risk analysis for winter maintenance budgeting. Some agencies budget for winter maintenance utilizing the average of X years where next years budget is based on what was spent in previous years. This leads to a “use it or loose it” mentality. Other agencies utilize zero-based budgeting where you justify your budget every year. In periods of high weather variability understanding the risks associated with variable weather vs. the benefits would be helpful.</p>
20	<p>Winter contracting methods to augment agency resources While some states completely outsource winter maintenance others could benefit from contracting for service on a limited basis to augment their resources in time of need. Examples of “contractor auxiliaries” or other prearranged agreements may help in extreme situations.</p>
21	<p>Syntheses of how agencies are addressing driver rest periods during winter operations. This synthesis would look at agency snow plans and see how they are addressing the employee rest period requirements.</p>
22	<p>Evaluate templates for creating Snow Plans Snow plans are an invaluable tool for winter maintenance. There are several templates available to help agencies create customized snow plans. This will evaluate the various offerings and comment on the effectiveness of covering all the bases.</p>
23	<p>Study how social media can be used in winter maintenance. Social media has the potential to help agencies support achieving their level of service, provide education and feedback to maintenance operations.</p>
24	<p>Determine the benefits of public information for winter maintenance. Every agency has a public information mission that relies heavily on information provided by maintenance. Determining the benefits of the various public information programs will provide assistance in implementing future programs and securing funding.</p>
25	<p>Determine what information and in what form the public needs /wants to make informed decisions about winter travel. When the public makes informed decisions about winter travel there is a clear benefit to the delivery of winter maintenance. There may be opportunities for partnerships with private information providers like Google, Inrex, and Waze.</p>

Breakout D: Weather, Information, and Traffic Operations

26	<p>Create a tool to determine the accuracy of RWIS Defining the accuracy of RWIS is often handled on an ad hoc basis. Having a tool to utilize would take the subjectivity out of the analysis.</p>
27	<p>Guidelines for forecaster quality control. Develop guidelines for agencies to utilize in developing a forecaster quality control program.</p>
28	<p>Best practices for forecast delivery. Document the best practices for delivering forecasts to maintenance personnel, models for communication between the forecast staff and the field staff, and how to achieve forecast feedback and continuous improvement.</p>
29	<p>Case studies of RWIS utilization during non-winter periods RWIS represents a considerable investment and could provide important weather information for non-winter weather sensitive activities such as traffic management, construction, or maintenance projects.</p>
30	<p>Case studies of how to deal with forecasts that bust. Eventually every agency will have to deal with a forecast that busts. These case studies will highlight effective ways to deal with the fall out internally, with service providers, and externally.</p>
31	<p>Request For Proposal best practices when securing value added meteorological services. For agencies to obtain the best service to meet their needs from VAM services they need to know what is possible, what is reasonable, and what is acceptable.</p>
32	<p>Best practices for use of forecasts and RWIS data Forecasts and RWIS data have value that extends beyond operational winter maintenance decision-making. The public is increasingly interested in RWIS data as they plan outdoor activities, it is an important element of traveler information systems like 511, and has value to private information providers.</p>
33	<p>Study opportunities for partnership between agencies and private information providers. Private information providers are another opportunity to get information in the hands of motorists to make decisions regarding winter travel.</p>
34	<p>Best practices or training template for VAM to understand the DOT customer. Bringing maintenance field personnel and meteorologists together is a tricky endeavor. To obtain the most value from the relationship each must have an understanding of the others language, needs, and limitations.</p>
35	<p>Literature survey on ways to manage and use big data. More and more data elements are being collected and gathered from other sources. This trend is only going to increase particularly with the introduction of connected vehicle data platforms. Forecasters and agencies alike need insight into big data.</p>

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Information to the snowplow driver.

Demands on the snowplow driver are particularly high during winter operations. Determining what information the need, if there is different information available that would be useful and are there better sources of information would be useful to help them with their duties.