

2020 Michigan Winter Operations Conference

Day 2 – Wednesday, October 14th



Upcoming Trends in Winter Operations



Today's speakers

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Winter road maintenance is evolving

From small towns to large DOTs, the questions are the same:

- What does the evolution mean to operators and managers?
- How can you best apply new technologies and practices to improve efficiency while also ensuring your community is safe?

Today's goal:

- Explain what today's innovations mean to you
- What steps can your agency take to implement these trends



Agencies moving from reactive to proactive operations

For several different reasons:



High expectations from roadway users



Environmental concerns of over salting

Reducing costs while providing the needed levels of service



Agencies moving from reactive to proactive operations

- Generally agencies are achieving it by incorporating these proactive approaches:
 - Use of chemicals and liquids
 - Computerized dispensing systems
 - Weather forecasting
 - Weather tools such as RWIS
 - Mobile sensors
- May also incorporate AVL/GPS route optimization, thermal mapping, and maintenance decision support systems (MDSS) to enhance operations





Liquids, liquids, liquids

- Incorporated in three different ways:
 - Pre-treating a stockpile
 - Pre-wetting materials as they are applied to a roadway
 - Pre-treating of roadway prior to an event
- Each of these methods has great benefits for an agency:
 - Reduces amount of material needed throughout the event
 - Aids in the performance of the chemical
 - Prevents snow and ice from bonding to the roadway
- Requires good knowledge of how they work and the necessary weather data to make informed decisions about how and when to apply them





Implementation of high-performance products



- Examples:
 - New high-performance snowplow blades
 - New snowplow design such as expandable plows and the tow plow
 - New ground-speed computerized dispensing and hydraulic systems
 - New sensors such as mobile RWIS
- Designed to be more efficient and help the operator and agency
- Studies prove ROI despite the initial costs being higher than their predecessors

SUPERIOR SCRAPING AND LESS VIBRATION/NOISE



Mobile sensors

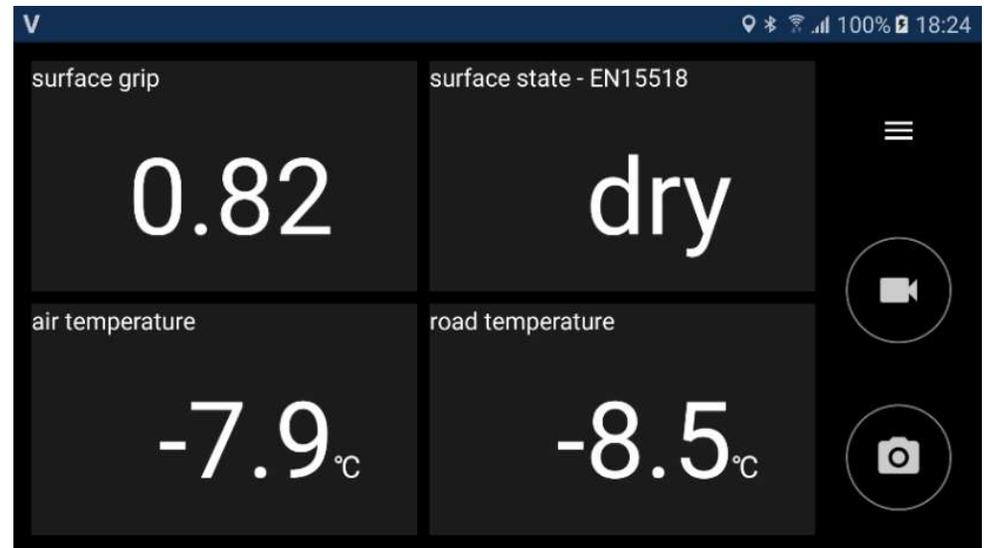
- Help operators and agencies evaluate roadway conditions prior to and during events
- Vehicle-mounted units provide data both to operator and the agency
- Continuous innovation:
 - Traditional units gave pavement and ambient air temperature
 - 2nd generation units added dew point and relative humidity
 - NOW: Mobile units are capable of giving these parameters but also roadway state, thickness, and friction
 - Can be mounted on snowplows and hold up in difficult conditions





Mobile sensors

- Data is vital to the operator for road evaluation, material selection and application rates — make informed decisions based on real-time data.
- Agency can use data to evaluate performance and material usage





Incorporating Big Data into operations



- Agencies today are collecting more data than ever before
- Collecting data that is useful and applicable is often difficult
- Agencies and vendors have worked together to utilize this data to benefit winter operations
- Data that can be visualized into useful products such as road segment forecasting, roadway assessments, traffic and incidents, and even visualization of roadway conditions and snowplow locations
- Data can also help determine and resiliency of an agency and its system



Optimizing routes



- Done using software, consultants, AVL data, or by in-house staffing
- Many agencies look to optimization to improve efficiencies and save money
 - This is not always the outcome
 - Safety and prioritization do not always equal efficiency
 - A combination of operator input, consultation, and optimization is often a better result

- Can also be used to:
 - Determine the proper fleet size and type
 - Site facilities and remote refill sites
 - Determine the need or role of contractors
 - Adjust operations to varying situations like split shifts, congestion, incidents, and blowing snow
- Also trending: The need for in cab equipment with turn-by-turn directions, dynamic optimization, and weather data to adjust operations as storms progress



Agencies incorporating performance measurement



- Vital to assessing and improving an agency
- Environmental concerns and salt management have become as important as budget issues
 - Agencies will be required to manage and document their use
- Management begins with good decisions and performance is measured through historical data
 - We have the tools to help agencies in these areas



A changing workforce



- Agencies struggling to adapt to new younger workforce, who are:
 - Demanding more flexibility and work-life balance
 - Open to incorporating the latest technologies
 - Not as interested in money and overtime
- What does it take to retain them?
 - Incorporate the technologies of interest
 - Learn how best to engage and utilize them



Training



- Vital to the success of individuals and agencies
- A trained employee not only understands how to do their job, they understand why
- Many good training programs exist
 - Some offer certificates such as APWA's Supervisors Workshop
 - May include hands-on calibration training and SPOT (snowplow operator training)
- Training is not just a benefit, but a best practice



Flexibility and innovation in purchasing

- Agencies are striving to find better ways to purchase the goods and services they need for winter maintenance
- Innovative approaches such as leasing or using joint purchasing has allowed agencies to make capital purchases without going through traditional methods
 - Very popular now
 - Offer great flexibility
 - Agencies can purchase the products they really want
- Types of purchases can be equipment, materials such as salt or liquids, and weather systems including RWIS





Environmental concerns and sustainable operations

- Sustainable operations only achieved when best practices are incorporated into an agency **and** accountability is enforced
- Rising chloride levels of primary concern, but all materials and chemicals have impacts on the environment
- Agencies using best practices have seen a reduction in material usage while still meeting level of service goals





Conclusion



The trends we discussed here are changing how agencies approach their jobs

They are disruptions, certainly, but innovation is almost always disruptive

The opportunities and efficiencies they unlock will continue to shape our field for years to come



Thank You

