

# 2020 Michigan Winter Operations Conference

Day 2 – Wednesday, October 14<sup>th</sup>



# Upcoming Trends in Winter Operations



## Today's speakers

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**VAISALA**

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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

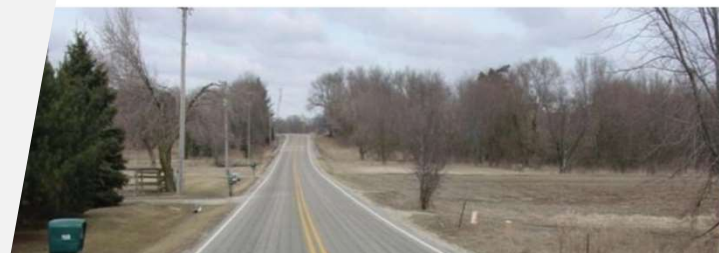
Reducing costs while providing  
the needed levels of service





## 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

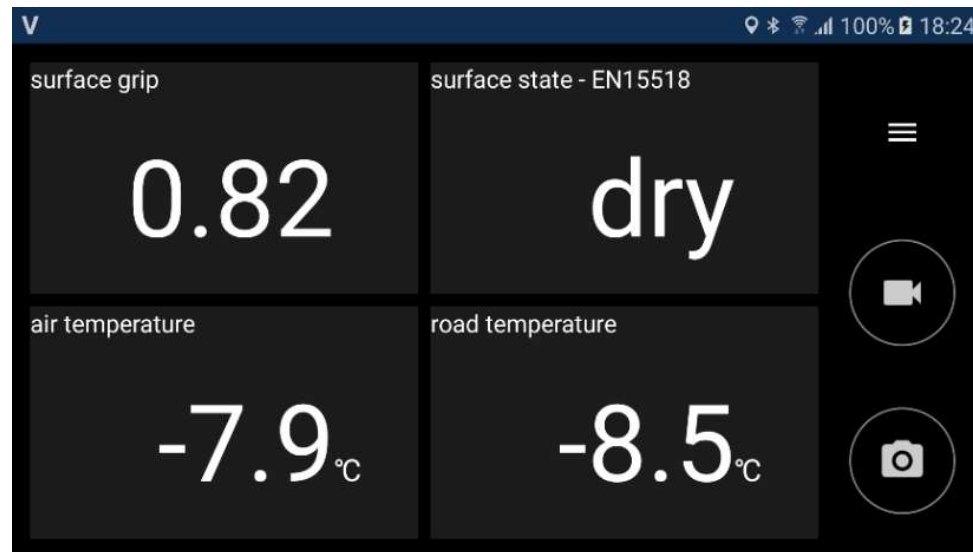
- Help operators and agencies evaluate roadway conditions prior to and during events
- Vehicle-mounted units provide data both to operator and the agency
- Continuous innovation:
  - Traditional units gave pavement and ambient air temperature
  - 2<sup>nd</sup> generation units added dew point and relative 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

