

The background is a blue gradient, transitioning from a lighter blue at the top to a darker blue at the bottom. Several white diagonal lines of varying thicknesses cross the image from the bottom-left towards the top-right.

# **APPLYING LONG-TERM THINKING TO WINTER MAINTENANCE OPERATIONS**

# OBJECTIVES

- ▶ Winter Maintenance operations require long-term thinking because actions which appear good in the short-term can actually be harmful in the long-term. Join us for this "soup to nuts" approach to winter maintenance planning. We'll feature examples for measuring operational performance and deploying sustainable practices.
  
  - ▶ Learning Objectives:
    - 1. Identify winter maintenance operations that need to be measured for more effective performance.
    - 2. Explore how to use operational performance measure to provide useful and actionable feedback.
    - 3. Determine how to gauge the long-term impacts of winter maintenance decisions to ensure a truly sustainable snow and ice control operation.
- 



Long Term Thinking



Resilience and Efficiency in operations



Quantifiable performance measures



Minimizing environmental impacts



Sustainability in Operations



Technology and Innovation

# TODAYS AGENDA



“Past performance is not a predictor of future events”



Expectations are increasing – can we meet them?



We cannot know what will happen, but we can certainly imagine what might happen...

LONG  
TERM  
THINKING



- ▶ What magnitude of events will I likely see in the future?
  - ▶ What will be my new normal?
- ▶ How can I respond to events that exceed my capacity?
- ▶ Do my tools allow me to communicate effectively how I am performing both internally and externally?

## THREE QUESTIONS TO ASK



- ▶ Does our current operational framework reflect best practices?
- ▶ What are those best practices?
- ▶ Where can I find out about them?
- ▶ The Top Ten List...

JOB ONE



Adequate funding for operations and sustainability



Using sustainable winter maintenance practices



Accurate and timely weather forecasts



Optimal route planning



Equipment, equipment calibration, and equipment maintenance program

IN THE TOP  
TEN



Efficiency in operations –  
intelligent use of resources



Communications between  
operations controllers and drivers



Snow plans

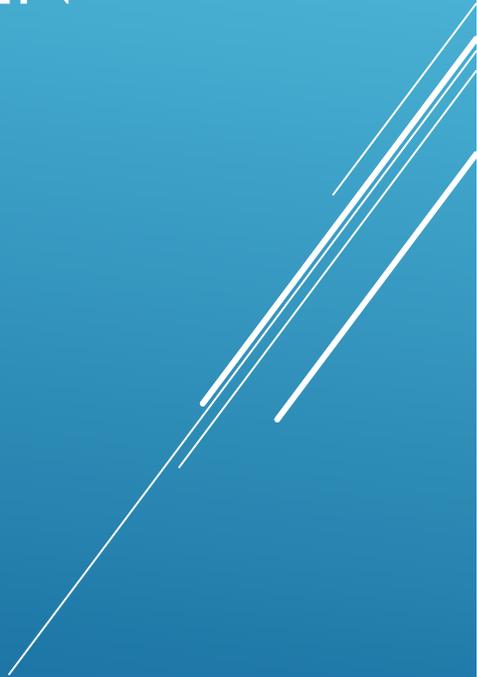


Standards in winter services

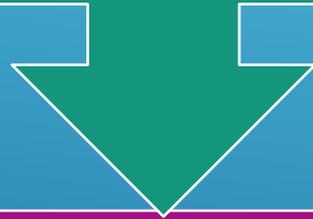


Defined levels of services

MORE TOP  
TEN



Serves as a starting point to figure out operational needs



Used to guide future research (the Winter Maintenance Peer Exchange process)

"winter wins the budget battle"

Efficiency in operations – 46%

Performance standards – 43%

Optimal route planning – 41%

Using sustainable winter maintenance practices – 34%

# HOW THE TOP TEN HELPS

# EFFICIENT OPERATIONS – LONG TERM...

What will the transportation system we care for look like in 20 – 30 years?

- ▶ New, expanded modal responsibilities?
- ▶ Expanding system, or shrinking?
- ▶ Impact of autonomous vehicles?
- ▶ Optimal winter maintenance operations allow maintenance enhancements elsewhere

Do you have clear standards? Were your customers involved in setting them?

- Collected into a snow plan?
- Various forms
  - Time to bare pavement
  - Time to regain speed
  - Time to regain traction or grip
- Different levels for different facilities
- LOS cuts both ways – do not over-perform...

PERFORMANCE  
STANDARDS



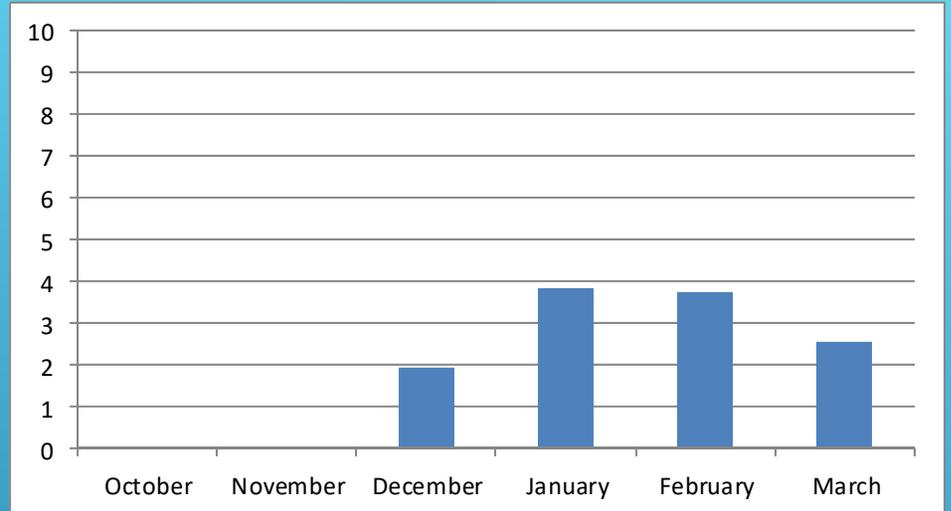
## What gets measured, gets done

- If you only measure tons of salt used, you will use more salt than you need to...
- Use outcome based measures instead of output based ones
- Normalize your measures with winter indices

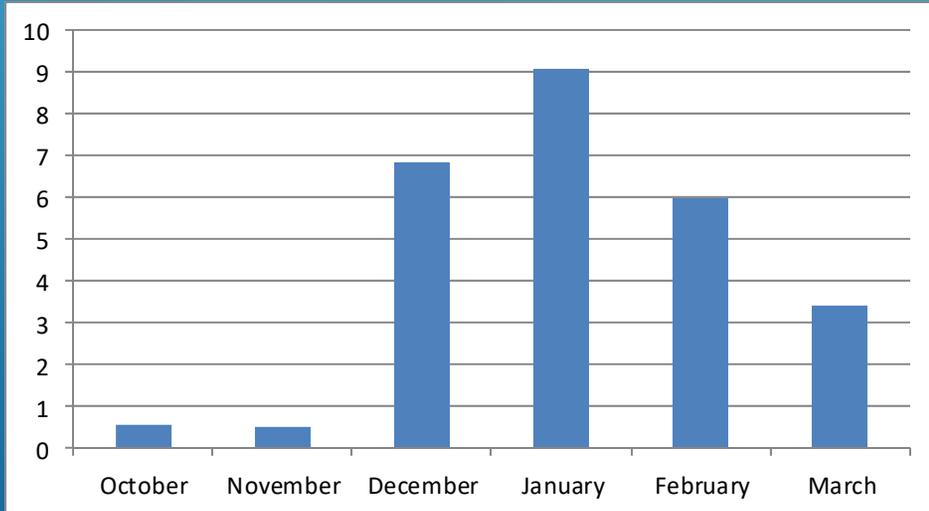
PERFORMANCE  
MEASUREMENTS



Moline 2013-14  
Total Salt Used = 13,420 Tons  
Tons/Index Point = 499



Moline 2012-13  
Total Salt Used = 11,200 Tons  
Tons/Index Point = 848



# USING THE WINTER INDEX

We do not know what the climate will do for our particular location, but it will change...

Have to balance risks and rewards - resilience

Have to break away from what we have always done

Just as being proactive is BMP in winter maintenance, so being proactive in planning is needed

PERFORMANCE TOOLS AND THE LONG TERM

By definition, it is long term thinking!

NOT JUST environmental awareness!

Again a balancing trick

- Social
- Economic
- Environmental

No one sustainable solution

One size **emphatically** does not fit all

But, sustainability does impact all aspects

# SUSTAINABILITY AND THE LONG TERM...

## Not a Means to an End – a Force Multiplier

- Have to make sure that the new technology is tied into changes in practice
- If you get the new technology, but still do the same old thing...
- So, once again tie technology choices into key performance goals

TECHNOLOGY AND THE LONG TERM...

Suppose a data-transmission solution costs you \$1,000 per block of data moved today

- In 18 months, it will cost \$300
- In 36 months it will cost \$100
- In 54 months it will cost \$30
- In 72 months (6 years) it will cost \$10
- Is it affordable then? If so, start planning for it now...

THE FORCE MULTIPLIER



Liaise with other agencies  
– multiagency agreements  
and planning are key



A dynamic outlook  
requires you to look  
forward – capital  
expenditures need to be  
this way



Performance measures  
can build a case for long  
term changes



Sustainability provides a  
method to involve  
customers

# DEALING WITH “BEYOND DESIGN” EVENTS





- ▶ Do you do EOC exercises on winter events?
- ▶ So the players know who is who
- ▶ So the available equipment is known to all
- ▶ So you know your capabilities when EOC is deployed
- ▶ So you can practice using the command process established by NIMS

## EOC AS A TOOL

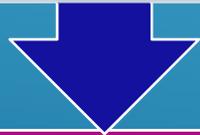
We have to use imagination to deal with possible new scenarios

Trains us away from "the way we have always done things"



All capital purchases are long term in their implications

That new truck will be with you for 15 years or more



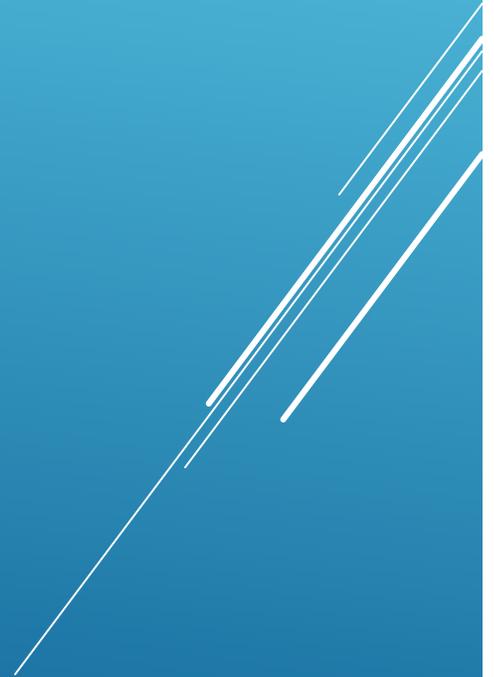
How can we extend the use of our resources?

Use water trucks to anti-ice

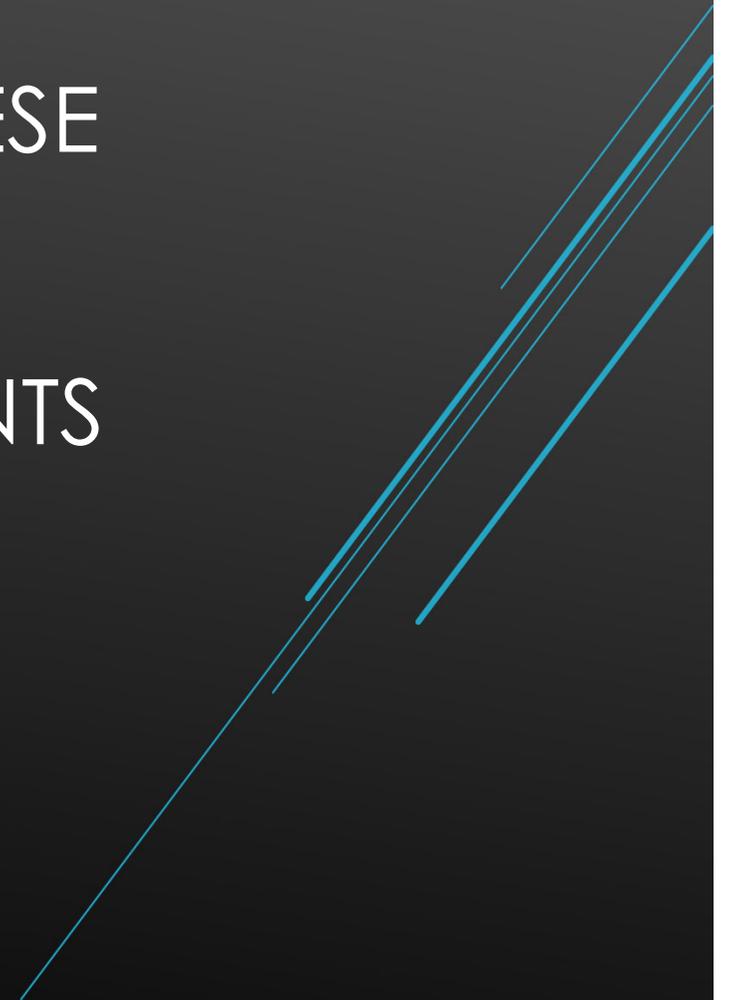
Use heavy GVW vehicles to plow (garbage trucks)

Equip all small trucks with (small) plows

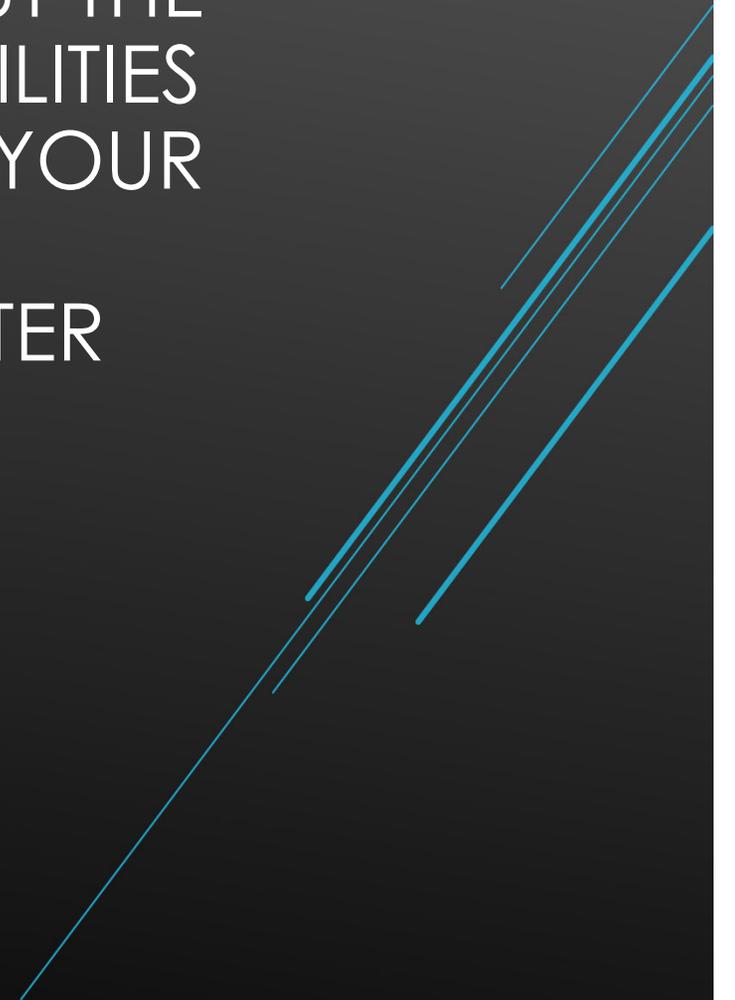
WHAT IFS AND IMPLEMENTATION



RELYING ON THE PAST TO  
PLAN FOR WINTER MIGHT  
NOT BE SUFFICIENT IN THESE  
TIMES OF CHANGING  
CLIMATE AND MORE  
FREQUENT EXTREME EVENTS



LONG-TERM THINKING ABOUT THE  
CLIMATE AND YOUR CAPABILITIES  
ALLOWS YOU TO CONTROL YOUR  
OWN DESTINY RATHER THAN  
REACTING TO CHANGES AFTER  
THE FACT





PERFORMANCE  
STANDARDS AND  
PERFORMANCE  
MEASURES CREATE A  
VOCABULARY FOR  
DISCUSSING WINTER  
MAINTENANCE WITH  
EMPLOYEES AND THE  
PUBLIC

PERFORMANCE  
MEASURES CAN  
HELP MAKE THE  
CASE FOR  
CHANGES IN  
OPERATIONS BY  
PLAYING “WHAT-  
IF” SCENARIOS



SUSTAINABLE SOLUTIONS  
PROVIDE THE BALANCE  
BETWEEN THE  
ENVIRONMENT, BUDGET  
AND PUBLIC EXPECTATIONS  
AND CREATE THE  
FRAMEWORK FOR  
DISCUSSIONS BETWEEN THE  
DIFFERENT GROUPS WITH  
COMPETING INTERESTS



TECHNOLOGY IS  
ALWAYS OFFERING  
NEW SOLUTIONS, BUT  
REMEMBER,  
TECHNOLOGY IS ONLY  
A FORCE MULTIPLIER  
TO ACHIEVE  
EFFICIENCIES IN  
ACTIVITIES

UTILIZE SOCIAL  
MEDIA AND OTHER  
FORMS OF  
COMMUNICATION  
WITH EMPLOYEES  
AND THE PUBLIC –  
THEY THIRST FOR  
INFORMATION

PRACTICE FOR THE “BEYOND  
DESIGN” EVENTS WITH OTHER  
AGENCIES SO WHEN THEY  
REALLY HAPPEN YOU ALREADY  
HAVE A RELATIONSHIP WITH THE  
OTHERS WHO ARE THERE TO  
“HELP” YOU



QUESTIONS?