Winter Maintenance

“Through the Windshield of the Operator”

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McHenry County DOT, Woodstock, IL

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City of West Des Moines, IA
Proactive and Reactive Winter Operations

- **Proactive**
  - Snow fence
  - Forecasting
  - Communication
  - Anti-icing
  - Shift management
  - Pre-wetting salt

- **Reactive**
  - Plowing
  - Salting
  - Winging
  - Technology
Snow Fence: What’s with the bright orange fence everywhere?
**Snow Fence:** What’s with the bright orange fence everywhere?

When – Preseason
**Snow Fence:** What’s with the bright orange fence everywhere?

When – Preseason

Benefit – Limits drifting
**Snow Fence:** What’s with the bright orange fence everywhere?

When – Preseason

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Limitations – 550 Lane miles, Time to install, Man power
Snow Fence: What’s with the bright orange fence everywhere?

When – Preseason

Benefit – Limits drifting

Limitations - Lane miles, Time to install, Man power

What we do – Intersections, trouble areas
**Snow Fence**: What’s with the bright orange fence everywhere?

When – Preseason

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What we do – Intersections, trouble areas

What I think – more, more, more!!!
Snow Fence: What’s with the bright orange fence everywhere?

When – Preseason

Benefit – Limits drifting

Limitations - Lane miles, Time to install, Man power

What we do – Intersections, trouble areas

What I think – more, more, more!!!

Alternatives – Test other types, Vegetation as snow fence
Forecasting – It's not rocket science, or is it?
Forecasting – It's not rocket science, or is it?

When – Pre-event
Forecasting – It's not rocket science, or is it?

When – Pre-event

Benefit – Planning
Forecasting – It's not rocket science, or is it?

When – Pre-event

Benefit – Planning

Limitations – Meteorologist, Radar, Not psychic
Forecasting – Its not rocket science, or is it?

When – Pre-event

Benefit – Planning

Limitations – Meteorologist, Radar, Not psychic

What we do – Private meteorologist, air and road temp sensors, RWIS
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When – Pre-event

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What we do – Private meteorologist, air and road temp sensors, RWIS

What I think – Never perfect, Best we can do
Forecasting – It's not rocket science, or is it?

When – Pre-event

Benefit – Planning

Limitations – Meteorologist, Radar, Not psychic

What we do – Private meteorologist, air and road temp sensors, RWIS

What I think – Never perfect, Best we can do

Alternatives – Guess, Change the weather
Communication – Call me!
Communication – Call me!

When – pre event
Communication – Call me!

When – pre event

Benefit – information about storm, everyone knows plan
Communication – Call me!

When – pre event

Benefit – information about storm, everyone knows plan

Limitations – time, having information
Communication – Call me!

When – pre event

Benefit – information about storm, everyone knows plan

Limitations – time, having information

What we do – pre event meeting, bulletin board, Nextel group calls, text messages
Communication – Call me!

When – pre event

Benefit – information about storm, everyone knows plan

Limitations – time, having information

What we do – pre event meeting, bulletin board, Nextel group calls, text messages

What I think – tell me more
Communication – Call me!

When – pre event

Benefit – information about storm, everyone knows plan

Limitations – time, having information

What we do – pre event meeting, bulletin board, Nextel group calls, text messages

What I think – tell me more

Alternatives – can’t think of more there could be done pre event
Anti-Icing – Keep the roads clear, get ‘em wet
Anti-Icing – Keep the roads clear, get ‘em wet

When - pre event
Anti-Icing – Keep the roads clear, get ‘em wet

When - pre event

Benefit - preventing chemical bond
Anti-Icing – Keep the roads clear, get ‘em wet

When - pre event

Benefit - preventing chemical bond

Limitations – dilution, 15% and rising, man power, time
Anti-Icing – Keep the roads clear, get ‘em wet
When - pre event

Benefit - preventing chemical bond

Limitations – dilution, 15% and rising, man power, time

What we do – three levels of action, 85% brine 10% geomelt 5% chloride

Bridge decks, curves, shaded areas

All roadways
Anti-Icing – Equipment
Anti-Icing – Keep the roads clear, get ‘em wet
When - pre event

Benefit - preventing chemical bond

Limitations – dilution, 15% and rising, man power, time

What we do – three levels of action, 40 gal/lane mile

What I think – it’s catching on
Anti-Icing – Keep the roads clear, get ‘em wet

When - pre event

Benefit - preventing chemical bond

Limitations – dilution, 15% and rising, man power, time

What we do – three levels of action, 40 gal/lane mile

What I think – it’s catching on

Alternatives - hot water pipes under roadway
Shift Management - Put me in coach

Proactive Operations

When – pre event

Benefit

- rested drivers

24

Benefit

rested drivers

24

hour coverage

Limitations – cdl laws, drivers wear, level of service change

What we do – split shifts to best cover forecasted event

What I think – split it up

Alternatives – work straight through, pull off all together
Shift Management - Put me in coach

When – pre event
Shift Management - Put me in coach

When – pre event

Benefit – rested drivers, 24 hour coverage
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Alternatives – work straight through, pull off all together
Pre-wetting - a running head start
Pre-wetting - a running head start

When – during event

Benefit – activates salt, lowers bounce, reduces working temps

Limitations – pre-wet/salt ratio, volume, freeze/clump in pan

What we do – Supermix on every truck, 10 gal Supermix/1 ton salt in auger

What I think – great asset helps greatly in salt activation, reducing salt bounce, temps too low for salt alone.

Alternatives – all liquid, use salt for…
Pre-wetting - a running head start

When – during event
Benefit – activates salt, limits bounce, lowers working temps
Pre-wetting - a running head start

When – during event
Benefit – activates salt, limits bounce, lowers working temps
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Pre-wetting - a running head start

When – during event
Benefit – activates salt, limits bounce, lowers working temps
Limitations – prewet/salt ratio, volume, freeze/clump in pan
What we do – Supermix on every truck, 10 gal Supermix/1 ton salt in auger
100 gal
250 gal
800 gal
Pre-wetting - a running head start

When – during event
Benefit – activates salt, limits bounce, lowers working temps
Limitations – prewet/salt ratio, volume, freeze/clump in pan
What we do – Supermix on every truck, 10 gal Supermix/1 ton salt in auger
What I think – great asset. helps greatly in salt activation, reducing salt bounce, temps too low for salt alone.
wetting - a running head start

- during event fit – activates salt, limits ice, lowers working temps
- activations – prewet/salt ratio, saline, freeze/clump in pan
- we do – Supermix on every 10 gal Supermix/1 ton salt
- I think – great asset. helps primarily in salt activation, reducing bounce, temps too low for salt
- natives – heated augers to
wing – we sure put ‘em to the test this winter!
wing – we sure put ‘em to the test this winter!

— during snow accumulation
wing – we sure put ‘em to the test this winter!

On – during snow accumulation

Bait – most effective way of spreading snow
Reactive Operations

wing – we sure put ‘em to the test this winter!

n – during snow accumulation

fit – most effective way of

ving snow

ations – width of plow, plow bite,

c
The Show For Snow!
The Windshield of the Operator

Reactive Operations

wing – we sure put ‘em to the test this winter!

on – during snow accumulation

fit – most effective way of
ving snow

ations – width of plow, plow bite, etc.

t we do – Joma blades on funnel
boards, 25 mph optimal
Steel Blade vs. Rubber Encased Carbide Blade
wing – we sure put ‘em to the test this winter!

- during snow accumulation

- most effective way of moving snow

- width of plow, plow bite, etc

- we do – Joma blades on funnel boards, 25 mph optimal

- I think – Joma plow blades are...
wning – we sure put ‘em to the test this winter!

- during snow accumulation

- fitted – most effective way of removing snow

- configurations – width of plow, plow bite, etc.

- what we do – Joma blades on funnel boards, 25 mph optimal

- I think – Joma plow blades are

- alternatives – laser beams that instantly vaporize snow as you pass

Wouldn’t it be nice
Reactive Operations

- just a sprinkle during/after plowing
- melts existing snow, keeps from bonding to the road,

- temperature inventory
- we do – conserve

I think – 200-300 lbs per lane

- going all liquid and
Reactive Operations

- just a sprinkle – during/after plowing

I think – 200-300 lbs per lane
Reactive Operations

just a sprinkle – during/after plowing

fit – melts existing snow, keeps from bonding to the road, conservation

I think – 200-300 lbs per lane
Reactive Operations

- just a sprinkle

- during/after plowing

Salt – melts existing snow, keeps from bonding to the road,

- temperature inventory

- temperature, inventory
Reactive Operations

- just a sprinkle

- during/after plowing

- fits – melts existing snow, keeps from bonding to the road,

- sections – temperature, inventory

- we do – conserve conserve

- we do – conserve conserve
Reactive Operations

- just a sprinkle

- during/after plowing

- fits – melts existing snow, keeps from bonding to the road, on

- conditions – temperature, inventory

- we do – conserve conserve conserve.

I think – 200-300 lbs per lane
Reactive Operations

- just a sprinkle

- during/after plowing

- fits – melts existing snow, keeps from bonding to the road, on

- inventories – temperature, inventory

- we do – conserve conserve

- I think – 200-300 lbs per lane

- alternatives – going all liquid and

Power Tower- solar energy melts salt granuals which runs a turbine producing electricity
 ging – wingded, wang, wung?

Reactive Operations

...after snow accumulation

blocks drifting, clears

s

s

a

s

ations – wing length, 5-10

frozen windrows

we do – wing back large

falls wing drifting areas

I think – huge benefit!

n

atives – huge snow blowers
Reactive Operations

- after snow accumulation

I think – huge benefit!
Reactive Operations – after snow accumulation

fit – blocks drifting, clears

I think – huge benefit!

I think – huge snow blowers
Reactive Operations

- after snow accumulation
- blocks drifting, clears

- wing length, 5-10
- frozen windrows

I think – huge benefit!

hug – huge snow blowers
Winging – wingded, wang, wung?

Winging – after snow accumulation

Winging fits – blocks drifting, clears雅思

Winging fits – wing length, 5-10

Winging fits – frozen windrows

Winging fits – we do – wing back large

Winging fits – falls, wing drifting areas
Wing – wingded, wang, wung?

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- wing length, 5-10
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- wing length, 5-10

- frozen windrows

- we do – wing back large

- falls, wing drifting areas

- I think – huge benefit!

- alternatives – huge snow blowers

Lind County Iowa
Technology – What’s this… video games?
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- Right now!
Technology – What’s this… video games?

- Right now!

- Ease of use, Less wear, Efficiency
Technology – What’s this… video games?

- Right now!
- Ease of use, Less wear, Efficiency
- Quality of product, Operator ability to adjust
Technology – What’s this… video games?

Right now!

Benefit – Ease of use, Less wear, Greater, Efficiency

Specifications – Quality of product, Operator ability to adjust

we do – drive by download, 840 unit
Drive by download system
<table>
<thead>
<tr>
<th>Truck ID</th>
<th>File Name</th>
<th>Out of Range</th>
<th>Last Download</th>
</tr>
</thead>
<tbody>
<tr>
<td>P20</td>
<td></td>
<td>0%</td>
<td></td>
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<tr>
<td>P17</td>
<td></td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>P21</td>
<td></td>
<td>0%</td>
<td>03/24/08 07:36:51</td>
</tr>
<tr>
<td>P12</td>
<td></td>
<td>0%</td>
<td>03/24/08 09:17:23</td>
</tr>
<tr>
<td>P23</td>
<td></td>
<td>0%</td>
<td>03/24/08 11:56:45</td>
</tr>
<tr>
<td>P31</td>
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<td></td>
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<td>P25</td>
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<td>0%</td>
<td></td>
</tr>
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<td>P36</td>
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<td>0%</td>
<td></td>
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<td>0%</td>
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<td>03/24/08 07:16:28</td>
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<td>P28</td>
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<td>0%</td>
<td>03/24/08 12:31:28</td>
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<tr>
<td>P22</td>
<td></td>
<td>0%</td>
<td>03/24/08 09:30:10</td>
</tr>
</tbody>
</table>
Snow and Spreader Controls
Touch screen for initial setup

Joystick for adjustments on the go
Technology – What’s this… video games?

- Right now!
- Ease of use, Less wear, Efficiency
- Quality of product, Operator ability to adjust
- Drive by download, 840 unit
- I think – People are ready, Product needs time
Technology – What’s this... video games?

- Right now!

Benefits – Ease of use, Less wear and tear, Efficiency

Innovations – Quality of product, Operator ability to adjust

What we do – drive by download, 840 it

I think – People are ready for change, Product needs time
Proactive and Reactive Winter Operations

Proactive
- Snow fence
- Forecasting
- Communication
- Anti-icing
- Shift management
- Pre-wetting salt

Reactive
- Plowing
- Salting
- Winging
Thank you for your attention…
and don’t worry spring’s coming!
City of West Des Moines

Equipment
Versatility
Controllers - What we see as the good, bad and the ugly!
Wing Plow Guidance Laser
Trailer Units +/-’s
Streamer Nozzles – Why?
Plowing While Anti-Icing

Plowing Is The Most Effective Means Of Removing Snow
Brine Maker Issues
AVL – Why we like it!

Collect Information → Send & Receive Information → Record, Store & Display Information

- Temperature
- Location
- Salter
- Plow up/down

Wireless Systems: Radio, Cellular, Satellite

Data

Workstation
Discrete Sensors

- Hydraulic Switch
- Whisker Switch
- Metal Proximity Switch
- Magnetic Switch
# Material Usage Report

<table>
<thead>
<tr>
<th>Truck: 68</th>
<th>Amount</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Granular Used</td>
<td>12,455</td>
<td>Pounds</td>
</tr>
<tr>
<td>Total Pre-Wet Used</td>
<td>165.3</td>
<td>Gallons</td>
</tr>
<tr>
<td>Total Direct Liquid Used</td>
<td>245.7</td>
<td>Gallons</td>
</tr>
<tr>
<td>Total Other Used</td>
<td>0</td>
<td>Other</td>
</tr>
</tbody>
</table>
# Report Generation

Usage data for Snowplows during month of January 1998

<table>
<thead>
<tr>
<th>Garage</th>
<th>Maintenance</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Truck</th>
<th>Deadhead</th>
<th>Operation</th>
<th>Total</th>
<th>Percent Op</th>
<th>Material</th>
<th>Fuel</th>
</tr>
</thead>
<tbody>
<tr>
<td>1151</td>
<td>32</td>
<td>44</td>
<td>76</td>
<td>57.9%</td>
<td>6.5</td>
<td>145.6</td>
</tr>
<tr>
<td>1153</td>
<td>2</td>
<td>8</td>
<td>10</td>
<td>80.0%</td>
<td>1.1</td>
<td>27.0</td>
</tr>
<tr>
<td>1157</td>
<td>56</td>
<td>112</td>
<td>168</td>
<td>66.7%</td>
<td>8.9</td>
<td>265.0</td>
</tr>
<tr>
<td>1108</td>
<td>23</td>
<td>71</td>
<td>94</td>
<td>75.5%</td>
<td>5.8</td>
<td>187.3</td>
</tr>
</tbody>
</table>
Individual Routes
Plow Up/Down Indicator
Spread Rates
Spread Rates/Snow Zones
Playback Mode
New Spreader Design
Speed: 15 mph
Spreader: 14 Pulses/S
Prewet: 15 Pulses/S
Anti-Ice: 0 Pulses/S

SPREADER

300 LBS/MILE

1.5
Coated Salt/Effectiveness
Sharing our Experience
Development of Technology
Laser Guidance System
Training – Is it important?
SPOT Training
Simulators
TranSim VS III Driver Training Simulator with SnowPlow Training Software

- Smooth flow of crisp video images provided by 70 Hz update rates and 1024 x 768 display resolution.
- Realistic training at intersections available with our 180° Field of View.
- Bright driving environment offered by State-of-the-Art Plasma screens.
- Glass Dash offers flexible gauge placement common to common truck models.
- Repay capability is an excellent teaching tool.
- Touchscreen interface allows operational controls, gauges, and displays common to common.
- Heavy Duty Transmissions to simulate manual and automatic transmissions.
- Training Scenario and Vehicle Package option (See rear for Details).

www.i-sim.com
866-239-4746
COMPUTER BASED TRAINING
PERIODIC MAINTENANCE

You've performed pre-season maintenance, pre-tlip maintenance, within-event maintenance, and post-event maintenance. Still, some vehicle and equipment areas that should be given a thorough inspection periodically during the season to ensure proper and safe operation.

UNIT 4: Reporting for Each Event

CHECK FORMS SUPPLY

Verify that you have a supply of current accident forms in the cab as well as the supply of towing rig forms.
Importance of Good Relationships

Supervisors
Mechanics
Police
Dispatchers
Co-Workers
Importance of Input

Vehicle Specifications
Snow Shifts/Procedures
Storm Critiques
Processes