MDSS
A LOCAL PERSPECTIVE

Mark DeVries
McHenry County, Illinois
Sensible Salting

THE ENVIRONMENTAL IMPACTS OF TREATING ROADS

Mark DeVries
McHenry County DOT

COMPUTERIZED DISPENSING SYSTEMS
McHenry County DOT

Calibration

Mark DeVries
http://www.dotweatherview.com
McHenry County, Illinois

Approximately 600 Square Miles
AN EVER EXPANDING SYSTEM

19 ROUTES – 22 TRUCKS – 550 LANE MILES
Normal Operations – 22 trucks on 19 routes (includes two smaller trucks)

24 hour Operations - 12 trucks on 12 routes (may include one additional truck)

DIFFERENT LENGTHS AND CYCLE TIMES
BLOWING SNOW ISSUES
WE USE A LOT OF LIQUIDS

MCDOT APPLIES LIQUIDS DIRECTLY TO THE SALT ON BOARD EACH TRUCK (PRE-WETTING) AND DIRECTLY TO THE PAVEMENT PRIOR TO EACH EVENT (ANTI-ICING) AS SHOWN BELOW.
SUPER MIX

Components

Salt Brine  85%
Geo-melt  10%
Calcium Chloride  5%

WE COMBINE DIFFERENT DE-ICING LIQUIDS ON SITE
LONGER RESIDUAL CHANGED THE WAY WE DID OPERATIONS

McHenry County DOT

SUPERMIX - AFTER ONE WEEK
McHenry County DOT

APPLYING LIQUIDS DURING AN EVENT

DE-ICING OPERATIONS

Mark DeVries
HOW WE USE MDSS
CONTRACTED WEATHER SERVICE - DTN
LOOKING AHEAD
McHenry County DOT

Forecast Consultation is the Key!
Zone Forecast

TL2005-006-160330-
MCHENRY-LAKE ILLINOIS-
INCLUDING THE CITIES OF...WOODSTOCK...WAUKESHA
448 AM CST WED MAR 15 2006

...WINTER STORM WATCH IN EFFECT FROM THURSDAY MORNING THROUGH
THURSDAY EVENING...

...TODAY...PARTLY CLOUDY. HIGHS IN THE LOWER 40S. WEST WINDS 10 TO
15 MPH.
...TONIGHT...MOSTLY CLOUDY WITH A 60 PERCENT CHANCE OF SNOW. NOT AS
COLD. LOWS IN THE LOWER 30S. EAST WINDS 10 TO 20 MPH.
...THURSDAY...PERIODS OF SNOW. SNOW ACCUMULATION OF 5 TO 7 INCHES.
SUNSHINE. HIGHS IN THE LOWER 30S. EAST WINDS 15 TO 25 MPH IN THE
MORNING BECOMING NORTHEAST 10 TO 20 MPH IN THE AFTERNOON. CHANCE
OF PRECIPITATION 60 PERCENT.
...THURSDAY NIGHT...MOSTLY CLOUDY. A 50 PERCENT CHANCE OF LIGHT
SNOW IN THE EVENING. COLDER. LOWS IN THE LOWER 20S. NORTH WINDS
10 TO 20 MPH.
...FRIDAY...PARTLY CLOUDY. HIGHS IN THE MID 30S. NORTH WINDS 10 TO
15 MPH.
...FRIDAY NIGHT...PARTLY CLOUDY. LOWS 16 TO 20.
...SATURDAY...PARTLY CLOUDY. HIGHS IN THE MID 30S.
...SATURDAY NIGHT...PARTLY CLOUDY. LOWS IN THE LOWER 20S.
...SUNDAY...PARTLY CLOUDY. HIGHS IN THE UPPER 30S.
...SUNDAY NIGHT...PARTLY CLOUDY. LOWS IN THE MID 20S.
...MONDAY...MOSTLY CLOUDY. HIGHS IN THE UPPER 30S.
...MONDAY NIGHT...MOSTLY CLOUDY. LOWS IN THE MID 20S.
...TUESDAY...PARTLY CLOUDY. HIGHS IN THE UPPER 30S.
## McHenry County DOT

### MCDOT (MX0015)

<table>
<thead>
<tr>
<th>Hour</th>
<th>West 10PM</th>
<th>West 11PM</th>
<th>Thu 12AM</th>
<th>Thu 01AM</th>
<th>Thu 02AM</th>
<th>Thu 03AM</th>
<th>Thu 04AM</th>
<th>Thu 05AM</th>
<th>Thu 06AM</th>
<th>Thu 07AM</th>
<th>Thu 08AM</th>
<th>Thu 09AM</th>
<th>Thu 10AM</th>
<th>Thu 11AM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weather Condition</td>
<td>Mostly Cloudy</td>
<td>Mostly Cloudy</td>
<td>Cloudy</td>
<td>Snow Possible</td>
<td>Snow Likely</td>
<td>Snow Likely</td>
<td>Snow Likely</td>
<td>Snow Likely</td>
<td>Snow Likely</td>
<td>Snow Likely</td>
<td>Snow Likely</td>
<td>Snow Likely</td>
<td>Snow Likely</td>
<td>Snow Likely</td>
</tr>
<tr>
<td>Temperature (°F)</td>
<td>30</td>
<td>29</td>
<td>29</td>
<td>28</td>
<td>28</td>
<td>27</td>
<td>27</td>
<td>29</td>
<td>30</td>
<td>31</td>
<td>33</td>
<td>34</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>Humidity (%)</td>
<td>78</td>
<td>65</td>
<td>60</td>
<td>89</td>
<td>89</td>
<td>92</td>
<td>92</td>
<td>90</td>
<td>89</td>
<td>88</td>
<td>89</td>
<td>87</td>
<td>84</td>
<td></td>
</tr>
<tr>
<td>Wind Speed (mph)</td>
<td>5</td>
<td>6</td>
<td>6</td>
<td>7</td>
<td>9</td>
<td>11</td>
<td>12.0</td>
<td>13.0</td>
<td>20</td>
<td>14.0</td>
<td>21</td>
<td>15.0</td>
<td>22</td>
<td>17.0</td>
</tr>
</tbody>
</table>

### Additional Data

- Dew Point (°F): 24
- Precipitation Type: Wet Snow
- Precipitation Amount: None
- Bridge Temp (°F): 35
- Road Temp (°F): 38
- 24H Snow Accum (05AM-08AM): 0.00
- Bridge Frost Likely? No
- Road Frost Likely? No

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**Mark DeVries**
## Light Snow Storm (Above 32°F steady or rising)

<table>
<thead>
<tr>
<th>Initial Operations</th>
<th>Subsequent Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initial Pavement Surface Conditions</strong></td>
<td><strong>Dry Chemical Spread Rate kg/lane-km (lb/acre-mi)</strong></td>
</tr>
<tr>
<td>Maintenance Action</td>
<td>Liquid</td>
</tr>
<tr>
<td>Dry, wet, slush, or light snow cover</td>
<td>None, see comments</td>
</tr>
</tbody>
</table>

### Comments

1. Monitor pavement temperature closely for drops toward 0°C (32°F) and below
2. Treat icy patches if needed with chemical at 28kg/lane-km (100 lb/acre-mi), plow if needed

### Notes:

**CHEMICAL APPLICATIONS.**
1. Time initial and subsequent chemical applications to prevent deteriorating conditions or development of packed and bonded snow.
2. Apply chemical ahead of traffic rush periods occurring during storm.

**PLOWING.**
If needed, plow before chemical applications so that excess snow, slush, or ice is removed and pavement is wet, slushy, or lightly snow-covered when treated.
### Storm Planner

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Weather Event</th>
<th>Weather Forecast Pre-Storm</th>
<th>Surface Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>6/6/2007</td>
<td>Route 1</td>
<td>Heavy Snow</td>
<td>No Rain</td>
<td>32 to 25°F</td>
</tr>
</tbody>
</table>

#### Weather Forecast Post-Storm
- No Rain
- Wind over 15 MPH

#### Surface Temperature Post-Storm
- Surface Temp, Dropping

#### Updated Treatment Strategies

**Strategy - Pre-Storm**

Pre-treat roadway surface with Supermix 35 gal./lane-mile prior to onset of snow.

**Strategy - During Storm**

Plow and apply pre-wet solid chemical at 200 lbs./lane-mile when snow event begins. Plow and reaply solid chemical as needed to keep pavement bare. Monitor pavement temperature and increase application rate to 250-300 lbs./lane-mile if temperature drops below 25°F.

**Strategy - Post Storm**

Monitor pavement temperature. Continue to treat wet pavement with solid chemicals until the pavement is dry to prevent the formation of ice. Watch areas prone to drifting.

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To Do What If Scenarios: (1) Complete the Forecast and Click Update (2) Click on the Duplicate Record Button (3) Change the fields with "What If Data" (4) Check the What If Scenarios Checkbox (5) Click on the Update Button (6) To do another What If Scenario return to Step # 2 and repeat the steps.

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1/9 - 1/10 6" - 9" Snow

w/Blowing "Split Shift"

Blue - 4A - 330P
Orange - 330P - 330A
Blue - 330A - 230P
Orange - 230P - 12A

Check treatment recommendations
Subject to change

ECM
Pavement Temperature
# Deicing Application Rate Guidelines

24' of pavement (typical two-lane road)

These rates are not fixed values, but rather the middle of a range to be selected and adjusted by an agency according to its local conditions and experience.

<table>
<thead>
<tr>
<th>Pavement Temp. (°F) and Trend (T)</th>
<th>Weather Condition</th>
<th>Maintenance Actions</th>
<th>Salt Prewetted/Pretreated With Salt Brine (Lbs/2-lane mile)</th>
<th>Salt Prewetted/Pretreated With Other Blends (Lbs/2-lane mile)</th>
<th>Dry Salt* (Lbs/2-lane mile)</th>
<th>Winter Sand {abrasives}</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;30°F</td>
<td>Snow</td>
<td>Plow, treat intersections only</td>
<td>80</td>
<td>70</td>
<td>100*</td>
<td>Not recommended</td>
</tr>
<tr>
<td></td>
<td>Frz. rain</td>
<td>Apply chemical</td>
<td>80 – 160</td>
<td>70 – 140</td>
<td>100 – 200*</td>
<td>Not recommended</td>
</tr>
<tr>
<td>30°F - 25°F</td>
<td>Snow</td>
<td>Plow &amp; apply chemical</td>
<td>120 – 180</td>
<td>100 – 160</td>
<td>150 – 200*</td>
<td>Not recommended</td>
</tr>
<tr>
<td></td>
<td>Frz. rain</td>
<td>Apply chemical</td>
<td>160 – 200</td>
<td>130 – 180</td>
<td>180 – 240*</td>
<td>Not recommended</td>
</tr>
<tr>
<td>25°F - 30°F</td>
<td>Snow</td>
<td>Plow &amp; apply chemical</td>
<td>120 – 150</td>
<td>100 – 140</td>
<td>150 – 200*</td>
<td>Not recommended</td>
</tr>
<tr>
<td></td>
<td>Frz. rain</td>
<td>Apply chemical</td>
<td>160 – 240</td>
<td>140 – 210</td>
<td>200 – 300*</td>
<td>400</td>
</tr>
<tr>
<td>20°F - 25°F</td>
<td>Snow or frz. rain</td>
<td>Plow &amp; apply chemical</td>
<td>200 – 280</td>
<td>175 – 250</td>
<td>250 – 350*</td>
<td>400</td>
</tr>
<tr>
<td></td>
<td>Frz. rain</td>
<td>Apply chemical</td>
<td>240 – 320</td>
<td>210 – 280</td>
<td>300 – 400*</td>
<td>400</td>
</tr>
<tr>
<td>15°F - 20°F</td>
<td>Snow</td>
<td>Plow &amp; apply chemical</td>
<td>200 – 280</td>
<td>175 – 250</td>
<td>250 – 350*</td>
<td>Not recommended</td>
</tr>
<tr>
<td></td>
<td>Frz. rain</td>
<td>Apply chemical</td>
<td>240 – 320</td>
<td>210 – 280</td>
<td>300 – 400*</td>
<td>400</td>
</tr>
<tr>
<td>15°F - 20°F</td>
<td>Snow or frz. rain</td>
<td>Plow &amp; apply chemical</td>
<td>240 – 320</td>
<td>210 – 280</td>
<td>300 – 400*</td>
<td>500 for frz. rain</td>
</tr>
<tr>
<td>0°F to 15°F</td>
<td>Snow</td>
<td>Plow, treat with blends, sand hazardous areas</td>
<td>Not recommended</td>
<td>Not recommended</td>
<td>Not recommended</td>
<td>500 – 750 spot treat as needed</td>
</tr>
<tr>
<td>&lt;0°F</td>
<td>Snow</td>
<td>Plow, treat with blends, sand hazardous areas</td>
<td>Not recommended</td>
<td>Not recommended</td>
<td>Not recommended</td>
<td>500 – 750 spot treat as needed</td>
</tr>
</tbody>
</table>

*Dry salt is not recommended. It is likely to blow off the road before it melts ice.

**A blend of 6 – 8 gal/ton MgCl₂ or CaCl₂ added to NaCl can melt ice as low as -10°F.
HOLD A POST EVENT MEETING AS WELL!
McHenry County DOT

OUR OWN RWIS SITES
Transportation Agency Sharing of Data
Iowa - 71 sites

WI - 75 sites

Mark DeVries
<table>
<thead>
<tr>
<th>Timestamp (UTC)</th>
<th>Observation Type</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>2008-12-14 15:14</td>
<td>essAirTemperature (F)</td>
<td>39.02</td>
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<tr>
<td>2008-12-14 15:14</td>
<td>essDewpointTemp (F)</td>
<td>34.34</td>
</tr>
<tr>
<td>2008-12-14 15:14</td>
<td>essRelativeHumidity (%)</td>
<td>83.00</td>
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<tr>
<td>2008-12-14 15:14</td>
<td>essSubSurfaceTemperature (F)</td>
<td>31.46</td>
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<tr>
<td>2008-12-14 05:14</td>
<td>essSurfaceFreezePoint (F)</td>
<td>29.66</td>
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<tr>
<td>2008-12-14 15:14</td>
<td>essSurfaceFreezePoint (F)</td>
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<td>2008-12-14 15:14</td>
<td>essSurfaceTemperature (F)</td>
<td>42.44</td>
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<td>essSurfaceTemperature (F)</td>
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<td>essSurfaceTemperature (F)</td>
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<tr>
<td>2008-12-14 15:14</td>
<td>essSurfaceTemperature (F)</td>
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<td>2008-12-14 15:14</td>
<td>essVisibility (ft)</td>
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<tr>
<td>2008-12-14 05:14</td>
<td>icePercent (%)</td>
<td>0.00</td>
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<tr>
<td>2008-12-14 15:14</td>
<td>icePercent (%)</td>
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<tr>
<td>2008-12-14 15:14</td>
<td>windSensorAvgDirection (deg)</td>
<td>155.00</td>
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<tr>
<td>2008-12-14 15:14</td>
<td>windSensorAvgSpeed (mph)</td>
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<tr>
<td>2008-12-14 15:14</td>
<td>windSensorGustDirection (deg)</td>
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<tr>
<td>2008-12-14 15:14</td>
<td>windSensorGustSpeed (mph)</td>
<td>26.10</td>
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</tbody>
</table>
THANK YOU!

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rmdevries@co.mchenry.il.us