Overview

- Design Practices
- Level of Service
- Comparison of ConnDOT vs. New England States
- Pre-Storm/Planning
- Application Rates
- Inventory Control
- Complaint Procedures
- Moving Forward
Design Process

• Existing - Environmental Screening
  – Setting
  – Receptors
  – Aquifer Protection Areas

• Future
  – MS4 – Impaired Waters
  – Shared Data from DPH
Highway Operations Procedures
# Level of Service

- Roadways are classified by traffic volume:

<table>
<thead>
<tr>
<th>CLASS</th>
<th>DESCRIPTION</th>
<th>TREATMENT</th>
</tr>
</thead>
</table>
| **Class 1** – (Limited Access Highways)- | interstate routes and ramps, and expressway routes and ramps and emergency routes | • continuous service throughout the storm  
• roads and shoulders cleared within reasonable time following storms. |
| **Class 2** – (Primary)-            | major and minor collector highways                                          | • reduced plowing;  
• center generally clear,  
• providing for one-wheel path of traction in either direction     |
| **Class 3** – (Secondary/All Others)- | local roads and lower-volume roadways                                       | • low-level priority;  
• roadway may be snow covered and passable but heavy snow accumulations may develop |
Regional State Application Rates

- ConnDOT does not have a bare and wet pavement policy
- Our state highway system should remain **reasonably safe** and in a **passable** condition by **continuous plowing** and **judicious use** of snow and ice materials

<table>
<thead>
<tr>
<th>State</th>
<th>Conditions</th>
<th>Application Rate (lbs/lane-mile)</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONNECTICUT</td>
<td>Above 29°F</td>
<td>200</td>
<td>3 hours</td>
</tr>
<tr>
<td></td>
<td>20-29°F</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Below 20°F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MAINE</td>
<td>Above 20°F</td>
<td>100-300</td>
<td>Unknown</td>
</tr>
<tr>
<td></td>
<td>Below 20°F</td>
<td>300-800</td>
<td></td>
</tr>
<tr>
<td>MASSACHUSETTS</td>
<td>All</td>
<td>240</td>
<td>Unknown</td>
</tr>
<tr>
<td>NEW HAMPSHIRE</td>
<td>Sleet/Freezing Rain</td>
<td>300</td>
<td>1.5 - 2 hrs - Interstate</td>
</tr>
<tr>
<td></td>
<td>Snow: 20°F</td>
<td>250</td>
<td>2.5 - 3 hrs - State roads</td>
</tr>
<tr>
<td></td>
<td>Snow: &lt; 20°F</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td>NEW YORK</td>
<td>Above 32°F</td>
<td>160</td>
<td>Unknown</td>
</tr>
<tr>
<td></td>
<td>23-32°F</td>
<td>225 - 275</td>
<td></td>
</tr>
<tr>
<td></td>
<td>15-23°F</td>
<td>275 - 360</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Below 15°F</td>
<td>Abrasives</td>
<td></td>
</tr>
<tr>
<td>VERMONT</td>
<td>Above 32°F</td>
<td>0 - 100</td>
<td>Unknown</td>
</tr>
<tr>
<td></td>
<td>25-32°F</td>
<td>100 - 200</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20-25°F</td>
<td>200 - 300</td>
<td></td>
</tr>
<tr>
<td></td>
<td>15-20°F</td>
<td>300 - 400</td>
<td></td>
</tr>
<tr>
<td>RHODE ISLAND</td>
<td>All</td>
<td>320</td>
<td>Unknown</td>
</tr>
</tbody>
</table>
# Regional State Application Rates

<table>
<thead>
<tr>
<th>State</th>
<th>Total Lane Miles</th>
<th>Liquid Materials applied (gallons)</th>
<th>Average Liquid Materials applied (gallons) per Lane Mile</th>
<th>Relative Rank</th>
<th>Dry Materials applied (tons)</th>
<th>Average Dry Materials applied (tons) per Lane Mile</th>
<th>Relative Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONNECTICUT</td>
<td>10,870</td>
<td>1,606,170</td>
<td>148</td>
<td>3</td>
<td>188,610</td>
<td>17</td>
<td>4</td>
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<tr>
<td>MAINE</td>
<td>8,300</td>
<td>1,197,494</td>
<td>144</td>
<td>4</td>
<td>142,192</td>
<td>17</td>
<td>4</td>
</tr>
<tr>
<td>MASSACHUSETTS</td>
<td>16,000</td>
<td>3,340,000</td>
<td>209</td>
<td>2</td>
<td>516,327</td>
<td>32</td>
<td>1</td>
</tr>
<tr>
<td>NEW HAMPSHIRE</td>
<td>9,366</td>
<td>226,280</td>
<td>24</td>
<td>6</td>
<td>87,030</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>NEW YORK</td>
<td>43,716</td>
<td>1,537,170</td>
<td>35</td>
<td>5</td>
<td>1,090,000</td>
<td>25</td>
<td>2</td>
</tr>
<tr>
<td>VERMONT</td>
<td>6,511</td>
<td>2,833,669</td>
<td>435</td>
<td>1</td>
<td>127,382</td>
<td>20</td>
<td>3</td>
</tr>
<tr>
<td>RHODE ISLAND</td>
<td>3,300</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Pre-Storm/Planning

• Calibration
  – Spreaders
  – Pre-wetting Systems

• Training
  – Annual Operator Training
  – Tailgate Talks
Pre-Treating/Anti-Icing

• Proactive strategy
  – maintains a sufficient quantity of ice control chemicals on the pavement surface
  – before or very soon after precipitation or ice formation begins.

• Salt Brine (23%)
  – Bridge Decks
  – frost prone areas
    • Valleys
    • Shaded Areas
    • History
Application Rates

- Based upon Field Conditions
  - Type of precipitation
  - Roadway/Pavement temperature
- Road Weather Information Systems (RWIS)
- Solid Material – Sodium Chloride
- Liquid Material
  - > 25°F pre-wet with sodium chloride (brine)
  - < 25°F pre-wet with magnesium chloride
RWIS - Road Weather Information Systems

Pavement Sensors
Inventory Control

• Amount loaded onto trucks
  – Documented by Bucket
  – Loadrite® System

• Application Tracking by each storm route
  – Material Allotted – by storm conditions
  – Material Used
  – Material Returned
  – Supervisor Review
Complaint Procedures

• Complaints are typically received via:
  – Sister state agency (DEEP, DPH)
  – Directly from well owner
  – Local Health Department
  – Internal ConnDOT units (e.g., ConnDOT Maintenance).

• Property owner’s initial water sample is reviewed by ConnDOT.

• Bottled water is provided to homeowner as an interim drinking supply.

• ConnDOT then conducts investigation to determine the appropriate remedial solutions.
Trends & Solutions

Winter Severity & NaCl Concentrations

- Sodium
- Chloride
- Winter Severity

https://mrcc.illinois.edu/research/awssi/indexAwssi.jsp
Trends & Solutions

- Common issues with wells
  - Shallow overburden
  - Dug wells
  - Well zone of influence includes roadway network
- Well Siting
  - Near snow shelf
  - Near drainage
- Solutions are unique to each location
Moving Forward

• Siting of new wells:
  – Recognize that roadways are a potential source of pollution and there should be a 75 foot minimum separation distance

• Recognizing that private contractors are a large contributing factor
  – Green SnoPro – New Hampshire Model
  – Liability Relief

• Training
UCONN T2 Training

• Training targeting municipalities being put together by UCONN Technology Transfer Center.
  – Similar to New Hampshire Green SnowPro Certification.

• Will promote reduction of total salt usage through calibration of equipment and other ConnDOT best practices.

• UCONN T2 Center expects to preview the training course in Fall of 2018.
QUESTIONS

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