Welcome to Winter Operations
• The right product
• The right application rate
• The right equipment
Understanding Storm Types
All de-icing products must be in a liquid form to melt snow and ice.
Salt verses Calcium Chloride

At 30 degrees 1 pound of salt will melt 46.3 pounds of ice.

At 30 degrees 1 pound of calcium will melt 31.1 pounds of ice.
Sodium Chloride/Rock Salt

Pro’s: inexpensive, easy to apply, readily available,

Con’s: corrosive, not practical below 15 degrees
Calcium Chloride

Pro’s: melts ice faster than salt and works down to -20 degrees

Con’s: more expensive, draws moisture that can become slippery
Magnesium Chloride

Pro’s: melts ice faster than salt, practical use down to 5 degrees

Con’s: more expensive, attracts moisture that can become slippery
Agricultural Based Products

Pro’s: compatible with other products, less corrosive

Con’s: expensive, environmental concerns
Aggregates

Pro’s: inexpensive, offers some traction

Con’s: has no melting properties, clogs storm drains
No Materials Needed?
• Blowing snow
• Heavy snow
• Dry snow
• Sub zero temperatures
Choosing the Right Material

• Levels of service
• Expectations
• Budget
• Storage Capacity or type
• Equipment capabilities
Levels of Service and Expectations
The Use of Liquids
Why use Liquids?

• Ready to work

• Less material used

• Lower cost

• Easy to apply
Liquid Route
Salt Brine

Dry Route
Dry Salt
Salt Brine Application Rates

- Anti-icing – 40/60 gallon/lane mile
- Pre-wet – 8/12 gallon/ton
- Deicer – 70/100 gallon/lane mile
Combo liquid/granular equipment
Combo liquid/granular equipment
Combo liquid/granular equipment
Equipment Selection

• Level of service
• Budget
• Road width
• Climate
• Labor availability
Brine Anti-icing Equipment
Spreader Dump Truck & Plow
Snow Blower
Tow Plow
Wing Plows
Under Body Plow
V Plow
Maintenance Decision Support System
What is MDSS?

A computer system that integrates weather, road and maintenance information to provide scientifically driven recommendations.
RWIS – Road Weather Information Systems
Strategically Placed
Properly Located
JTRP
Joint Transportation Research Projects
• RWIS
• MDSS
• Performance metrics
• Liquid applications
Performance Metric using cost per weather hour/lane mile/

<table>
<thead>
<tr>
<th>CY11 Cost per Weather Hour per Lane Mile ($/HR-LNM)</th>
<th>(A) Adjusted CY11 $/HR-LNM (30%)</th>
<th>(B) CY11 Adjacent Subdistrict Average (25%)</th>
<th>(C) CY11 District Average (25%)</th>
<th>(D) CY11 State Average (20%)</th>
<th>CY12 Target</th>
<th>% Change from CY11 Actual</th>
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</thead>
<tbody>
<tr>
<td>Statewide</td>
<td>$ 5.69</td>
<td>$ 5.69</td>
<td>$ 5.69</td>
<td>$ 5.66</td>
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Performance Measurements

• Service miles/manhour

• Material usage

• Overtime

• Traffic speed (future)
QUESTIONS
Thank you!

Phil Ivy
INDOT Snow & Ice Program Manager