Brine Panel Discussion: Research, Instillation & Implementation
October 16, 2019
TOOLS IN THE TOOL BOX

Versatile
Flexible
Efficient

BEST PRACTICES
Winter Maintenance/Best Practices

- Planning
- Training
- Equipment
- Calibration
- Salt
- Sand
- Liquids

- Environment
- Travel Speed
- Infrastructure
- Pavement Temp
- Policy and Procedure
- Communication

Baby Steps
25% to 45% of Maintenance Budget nationally for the average year for Winter Maintenance

Diminishing Return on Investment other than Public Safety!
Key Talking Points

- Manufactured Salt Brine
- Water Supply
- Salt Gradation, Inert Ingredients
- Cleanout Issues
- Electrical Infrastructure
- Pumps
- Plumbing
- Fill Points
- Storage-Containment
Your Costs....

- **Staff**
- **Equipment**
- **Materials**
Your Costs....

H2O & Size/Volume of Water Supply

Electrical Supply
CONTAINMENT

- If you use less salt you will save $$$
- If you use less salt you do less damage to the infrastructure
- If you use less salt you do less damage to your equipment
- If you use less salt it is better for the environment

Expectations Remain The Same
Level-of-Service should improve
Salt Brine in Winter Maintenance

- Pre-Wetting
- Anti-Icing
- Direct Liquid application
- All Divisions of Maintenance (Roadways, Sidewalks & Parking lots)
Locations of Agencies on Panel

Emmet County Road Commission

City of Orchard Lake Village
Anti-Icing Operations
City of Orchard Lake Village

DIRECTOR OF CITY SERVICES
GERRY MCCALLUM
Orchard Lake was carved out of West Bloomfield as its own village in 1928 and became a city in 1964. We just had to keep the “Village” though!

- Population of about 2,600
- Orchard Lake is four square miles, but nearly half of that is underwater!
- Orchard Lake’s 8.5 miles of shoreline borders Orchard Lake, Cass Lake, and Upper Straits Lake.
City of Orchard Lake Village

- **MAJOR ROAD (1.8 MILES)**
- **RCOC ROADS (X MILES)**
- **ALL OTHER LOCAL ROADS (15.2 MILES)**
THANK YOU

SPECIAL THANKS
~
CITY OF FARMINGTON HILLS – BRYAN PICKWORTH & WEST BLOOMFIELD PARKS AND REC
EMMET COUNTY ROAD COMMISSION

NEW BRINE FACILITY
Emmet County Road Commission Facts

833 miles of County Roads (247 primary, 586 local)

216 lane miles of State Highway
LIQUID USEAGE

2017-2018: 59,000 gallons mineral well brine

2018-2019: 93,700 gallons mineral well brine
           10,400 gallons organic additive

102,100 gallons
QUESTIONS
MDOT

- Steven Wessels is a Transportation Maintenance Supervisor, Hastings-MI
- Started his career in 1997
Making Liquids Doesn’t Have to Be a Multimillion Dollar Project

However automation is nice
BRINE MAKERS
## Unit Costs

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<th>$/1000 cft</th>
<th>gal/cft</th>
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<tr>
<td>Water</td>
<td>$33.62</td>
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<td>Salt</td>
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<td>Beet</td>
<td>$1.50</td>
<td>$0.23</td>
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<tr>
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<th>$/gal (15%)</th>
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<tr>
<td>Salt</td>
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<tr>
<td>Beet</td>
<td>$0.30</td>
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<th>$/gal (32%)</th>
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<tbody>
<tr>
<td>Liq Calc. Chloride-Delivered</td>
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<tr>
<th></th>
<th>$/hr</th>
<th>gal/hr</th>
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<tbody>
<tr>
<td>Labor</td>
<td>$44.11</td>
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<td>$0.044</td>
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### Pure Brine Cost

- $/gal: $0.08

### 85/15 Blended Brine

- $/gal: $0.31

### 80/20 Blended Brine

- $/gal: $0.38

Operator 2 – loaded (electrical costs etc.)
Farmington Hills’ Lessons Learned

- Walk before you run – Shared Services / Vendors
- Careful of over promising clear roads 24/7 – Expectations
- Staff #1 resource – Train, Train, Train, Empower, Buy In
- Network – don’t reinvent the wheel, attend webinars, conf’s
- You will fail – Learn from your trials & pilot programs
- Brine is the most forgiving - if starting a program or blending. When used with organics can help environment.
- Brine is a cost effective way to start with liquids
- Communicate and take the time to tour other municipalities
THANK YOU – Questions ???
Single Axle/5 TONS - SALT= $300+

EVERYTIME YOU LOAD UP !!
(1) 5 YD cap. Truck = 4k Gal’s BRINE
Tandem Axle - 10 TONS of SALT = $600+

EVERYTIME YOU LOAD UP !!
PRE-WET PROGRAM

- The application of brine, calcium, or a mixture directly onto the salt at the spinner.
- Reduces salt bounce and amount required.
- Best results are achieved with 10 + gallons per ton applied.
- Achieves ‘wet pavement’ faster.
- Accelerates the brine process.
PRE-WET PROGRAM

- Overhead spray bar (for older equipment, trucks w/small tanks or pre-wet pump failures)
- Pile treat
Factoid: It Takes 10 Times More Resource to De-Ice than to Anti-Ice!

ADD UP ALL THE INTANGIBLES - SAFETY, EQUIP. WEAR & TEAR, LABOR, SALT, FUEL, etc. $$$
LIQUIDS IN OUR PROGRAM

- Reduced annual granular salt use (30% - 50%)
- High year before liquid = over 9,000 tons/yr.
- 2013 snow-mageddon only 6,400 tons used
- Avg. annual use about 5,000 tons
- Production of 100,000 gallons of brine/yr. to 1,000,000 gal. of brine now.
DLA- Direct Liquid Application

- Use on Freezing Fog, light snow events
- Use when pavement temps are 20 deg. and rising
- Completed entire routes with DLA
- Water main breaks
- Used instead of benching
- Consider route completion cycle time