

Technology Helping with Sustainability

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Supervisor

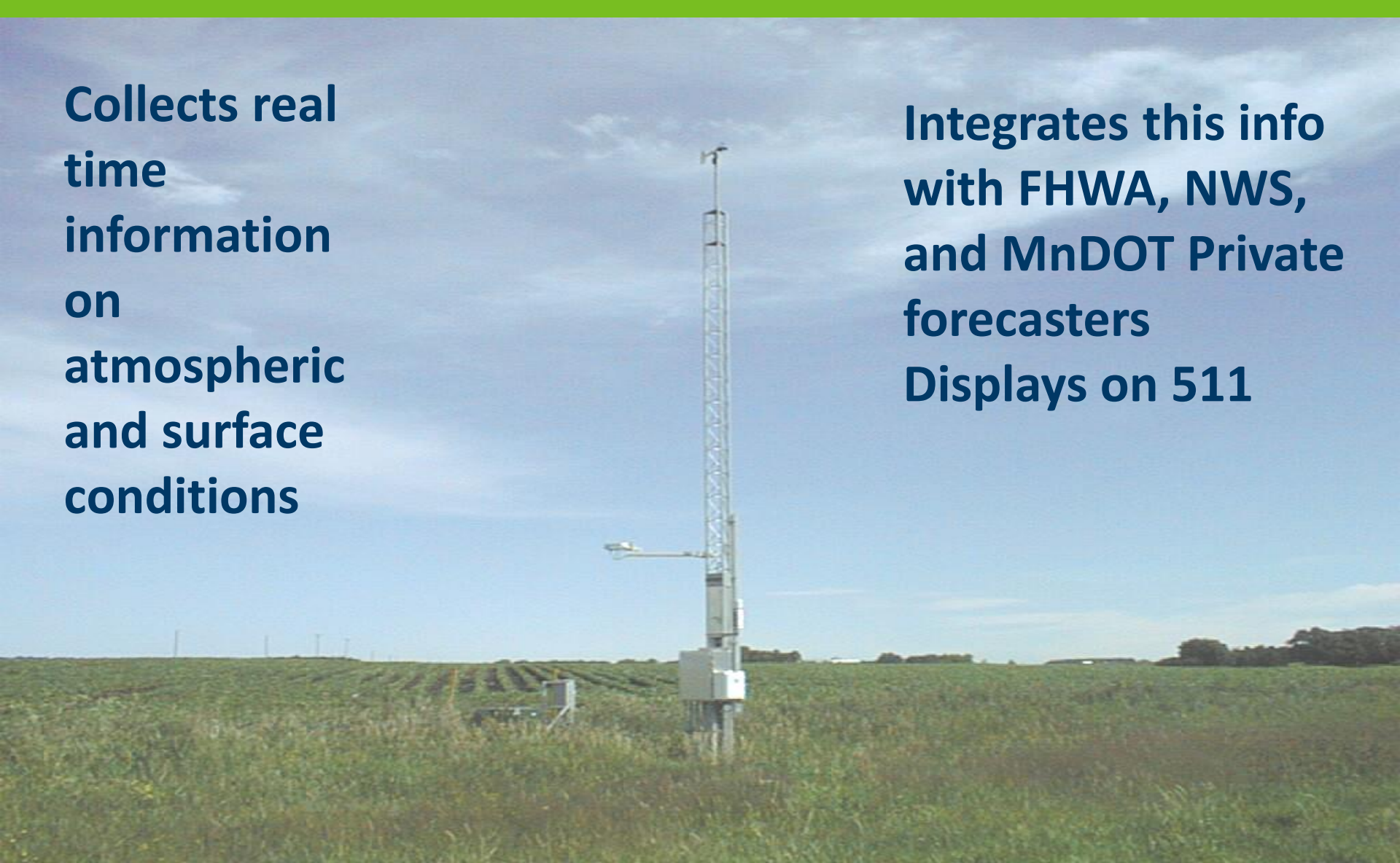
Road Weather Technology

- Four Major components to Road Weather Technology
 - Road Weather Information System (RWIS)
 - Automated Vehicle Location (AVL)
 - Maintenance Decision Support System (MDSS)
 - Salt Sustainability
 - Pathfinder

Road Weather Information System (RWIS)

Collects real time information on atmospheric and surface conditions

**Integrates this info with FHWA, NWS, and MnDOT Private forecasters
Displays on 511**



Automated Vehicle Location (AVL)

- 750 plow trucks equipped with Automated Vehicle Location (AVL)
- Mobile data collected
 - Air Temperature/Surface Temperature
 - Spreader controller information
 - Camera Images (250 plow cams)
 - 511 feed
 - Road/Weather conditions
 - Surface condition/Friction (mobile RWIS integration)

Operator Interface

9:51 AM
215568 GPS Time

Road
55 F
Air 49 F

Road Conditions Dry

Weather Conditions No Precip

Set Mark

Radar & Forecast

Cur Winds

Off Road

Bare Lane

Camera

End Shift

Bright

Collected Data



AMERITRAK
THE CLEAR CHOICE

| [Dashboard](#) | [Logout](#)

Active Count: 40

Welcome MnDOT Snow/Ice!

Please select an option...



[Vehicle History Report](#)



[Vehicle Mileage Report](#)



[Vehicle Stop Report](#)



[Find Vehicles Report](#)



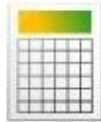
[Vehicle Speed Report](#)



[Vehicle Status Report](#)



[Snow Plow Report](#)



[Vanguard Map](#)



[Force America Report](#)



[DICKY-john Report](#)



[AT500/AT200 Tracking](#)



[Snapshot Viewer](#)



[Idle Report](#)



[Vaisala Conditions Report](#)



[CAN Bus Report](#)



[ObdII Report](#)



[CANBus Hrs/Miles Report](#)



[Vehicle Management](#)

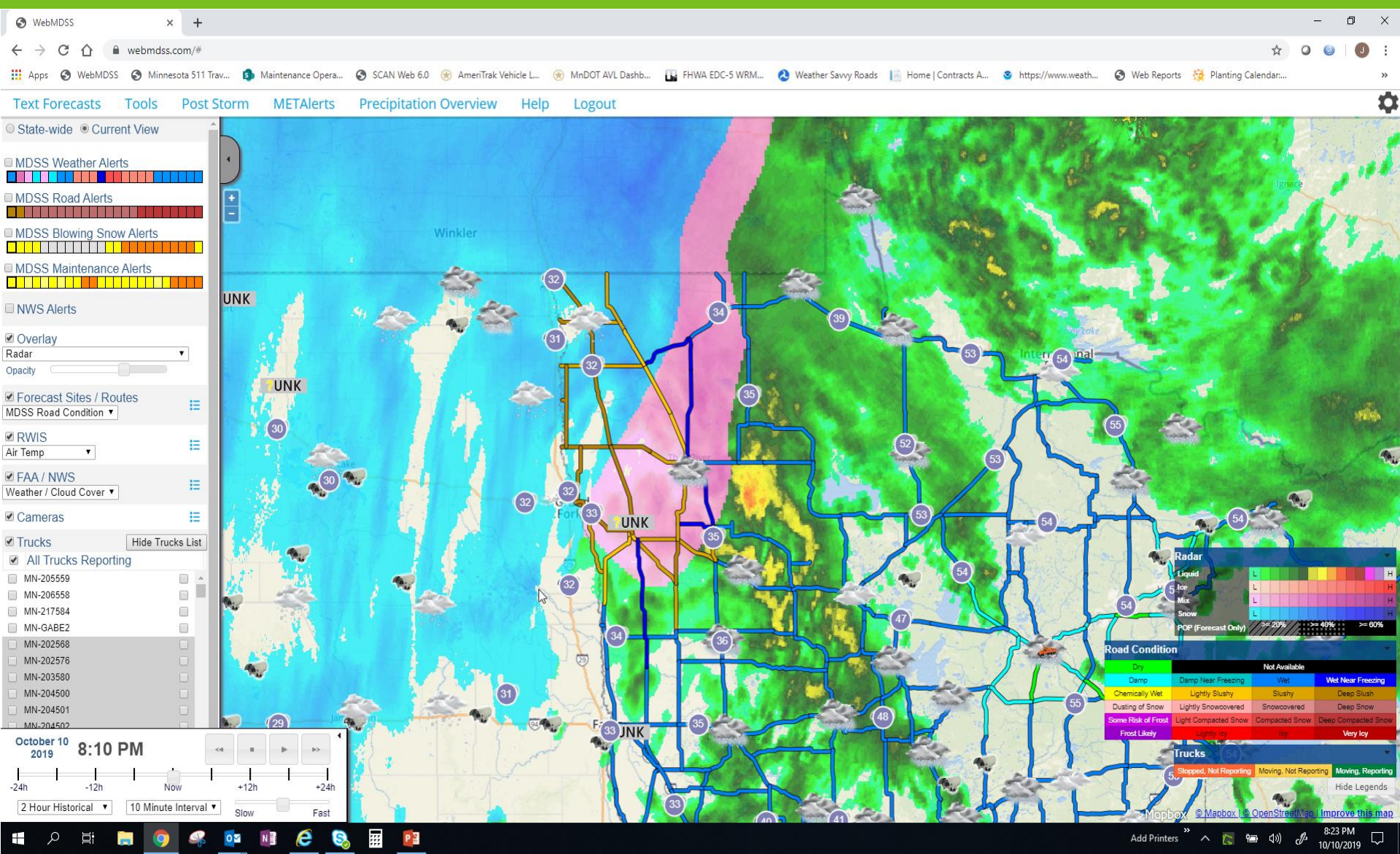
Save Login on this Computer.

There are a total of 424065625 rows in your database.

Maintenance Decision Support System (MDSS)

- WebMDSS
 - Maintenance Decision Support System
 - Provides detailed, hour by hour weather and pavement forecasts at the maintenance route level
 - Provides live, near real time map of current operations in the network
 - User interface provides truck, route, forecast, recommendation, images, and long range forecast data, to name a few
 - MnDOT's Reports interface

Maintenance Decision Support System (MDSS)



WebMDSS/Reports

Salt Usage
vs. MDSS
Recommended

Salt usage reported by operators vs. recommended by MDSS

Vehicle
Speed While
Applying
Chemical

Puts data points in bins based on speed while spreader is running

Average
Precipitation

Average precipitation by route and also sort by Sub Area/district

End of Shift
Report

Provides same end of shift data received in truck in reports application

Material
Usage By
Route

Details of all winter materials based on route as reported by RCA

AVL Status
Report

Reports AVL status for quick reference for supervisors

Sander
Status

Reports quick reference of sander, Auto, manual, conveyer, etc.

Reports Interface

Salt Usage vs. Recommended

Salt Usage vs. MDSS Recommended

Start

2018-10-01

End

2019-04-30

Area

District: 7

Line Width

4

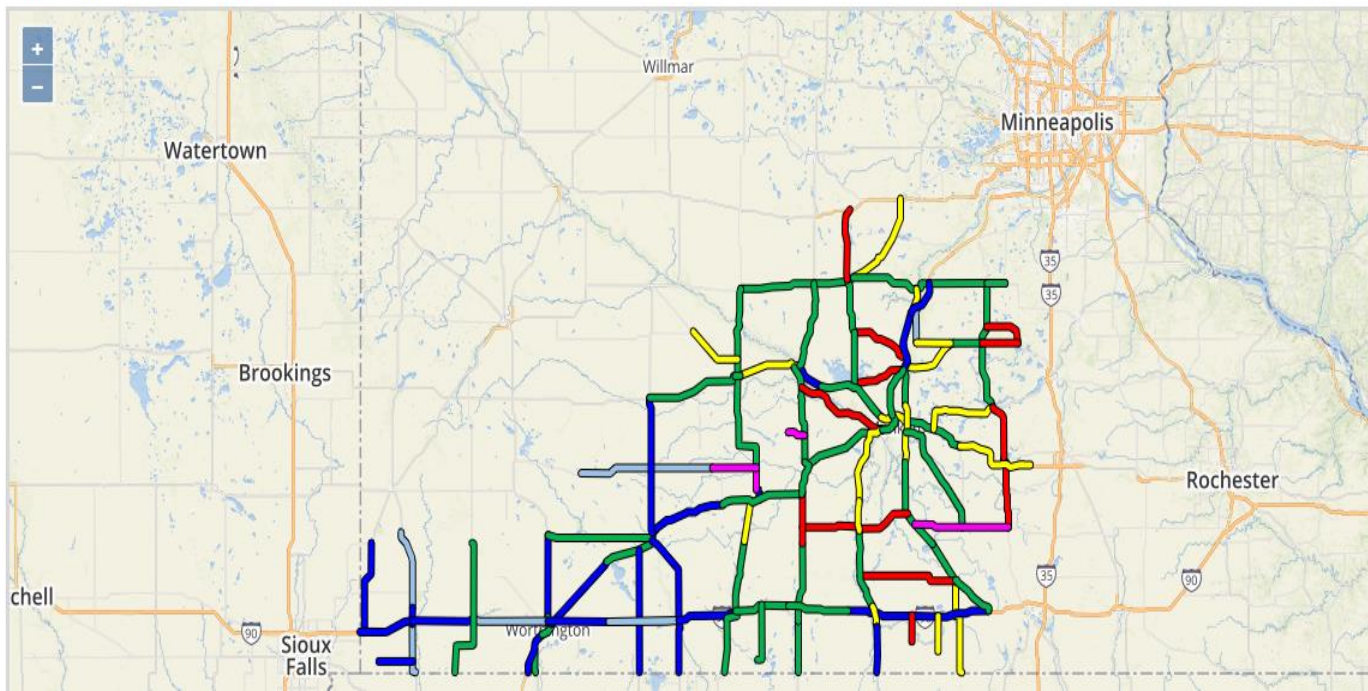
Tons

lbs/ln mile

Refresh Report

Material Usage vs. MDSS Recommended

Export CSV



- Error
- Recommended Without Application
- < 50% Recommended
- 51% - 79% Recommended
- 80% - 120% Recommended
- 121% - 149% Recommended
- 150% - 249% Recommended
- > 250% Recommended
- Application Without Recommendation

Vehicle Speed While Applying Chemical

Vehicle Speed While Applying Chemical

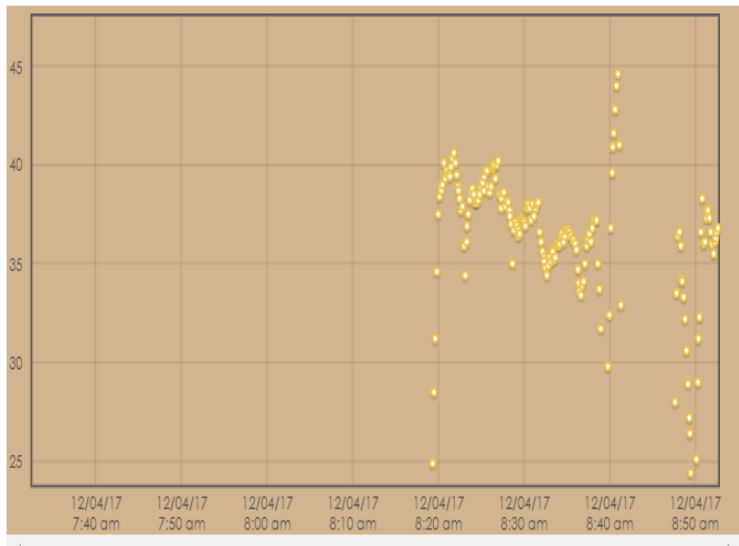
12/4/2017, 7:00:00 AM - 12/4/2017, 9:00:00 AM

Export to CSV

Statewide

Search:

| Truck ID | 0-4 MPH | 5-9 MPH | 10-14 MPH | 15-19 MPH | 20-24 MPH | 25-29 MPH | 30-34 MPH | > 35 MPH |
|-----------|---------|---------|-----------|-----------|-----------|-----------|-----------|----------|
| MN-204558 | 0 | 1 | 0 | 1 | 4 | 4 | 23 | 20 |
| MN-204578 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MN-205566 | 1 | 1 | 1 | 2 | 1 | 5 | 7 | 6 |
| MN-205574 | 0 | 1 | 5 | 2 | 4 | 8 | 39 | 184 |



End of Shift Report

End of Shift Report

Select Area: **2a**

| Start | End |
|------------|------------|
| 12-03-2017 | 12-04-2017 |
| 9:00pm | 9:00am |

Generate Report

Export to CSV

| | | | | | | | | | | | | |
|------------------|------------------|------------------|------------------|-----------|------------------|------------------|------------------|-----------|------------------|-----------|-----------|------------------|
| MN-204561 | MN-204563 | MN-204564 | MN-205503 | MN-205564 | MN-205565 | MN-206569 | MN-207508 | MN-207509 | MN-207570 | MN-207571 | MN-208556 | MN-208558 |
| MN-210553 | MN-210554 | MN-210555 | MN-211552 | MN-211553 | MN-211554 | MN-211555 | MN-212504 | MN-212505 | MN-212552 | MN-212553 | MN-212573 | MN-213553 |
| MN-214554 | MN-214555 | MN-215562 | MN-215563 | MN-215564 | MN-216562 | MN-216563 | MN-216564 | | | | | |

MN-215563

Requested Timeframe

2017-12-03 9:00 pm CST to 2017-12-04 9:00 am CST

| Route | Miles | Hours | Materials |
|---|-------|-------|---------------------------|
| All | 50.5 | 2 | 1791 lbs (0.90 tons) Salt |
| TP2H0112: MN11, E Jct. TH 89 at Roseau to CSAH 74 at W | 44.9 | 1.2 | 1430 lbs (0.71 tons) Salt |
| TP2H3131: MN313, Jct. TH 313 at Warroad to Canadian Bor | 1.5 | 0.1 | 146 lbs (0.07 tons) Salt |
| TP2H0113: MN11, Baudette Truck Station to CSAH 74 at W | 1.2 | 0.1 | 159 lbs (0.08 tons) Salt |
| TP2H0111: MN11, E Jct. TH 89 at Roseau to Jct. TH 32 a | 1.3 | 0.4 | None |

More Details

MnDOT Results

- Reduced speeds while applying chemical
 - Operators understanding the benefits
- Better data reporting by using “End of Shift Report”
- Recommendations are becoming a trusted source of information to operators
- Salt usage vs. recommended is a key performance measure for our Salt Sustainability Effort

Sustainability Tools



Salt Sustainability/Reduction

- Goal
 - MnDOT's immediate target is to reduce or mitigate chloride use based on calculated levels from its Maintenance Decision Support System, which is driven by winter weather data
 - Actual/reported usage by route to be not more than 10% over what is recommended by MDSS
 - Data integrity is critical for accurate measure
 - Equipment calibration is critical
 - Proper reporting of material is critical
 - MDSS enhancements

Thank you!

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