Technology Helping with Sustainability

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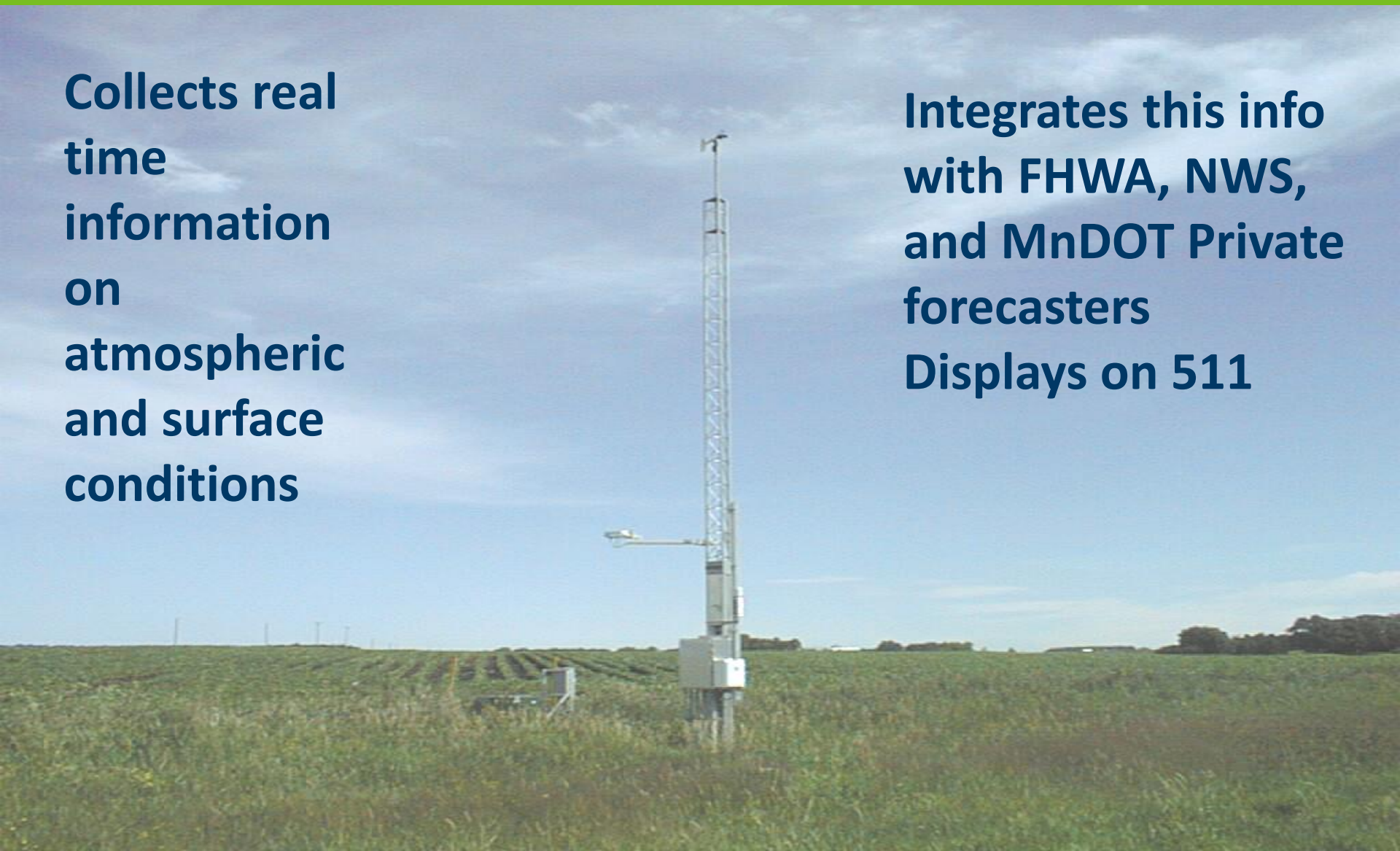
DEPARTMENT OF TRANSPORTATION

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

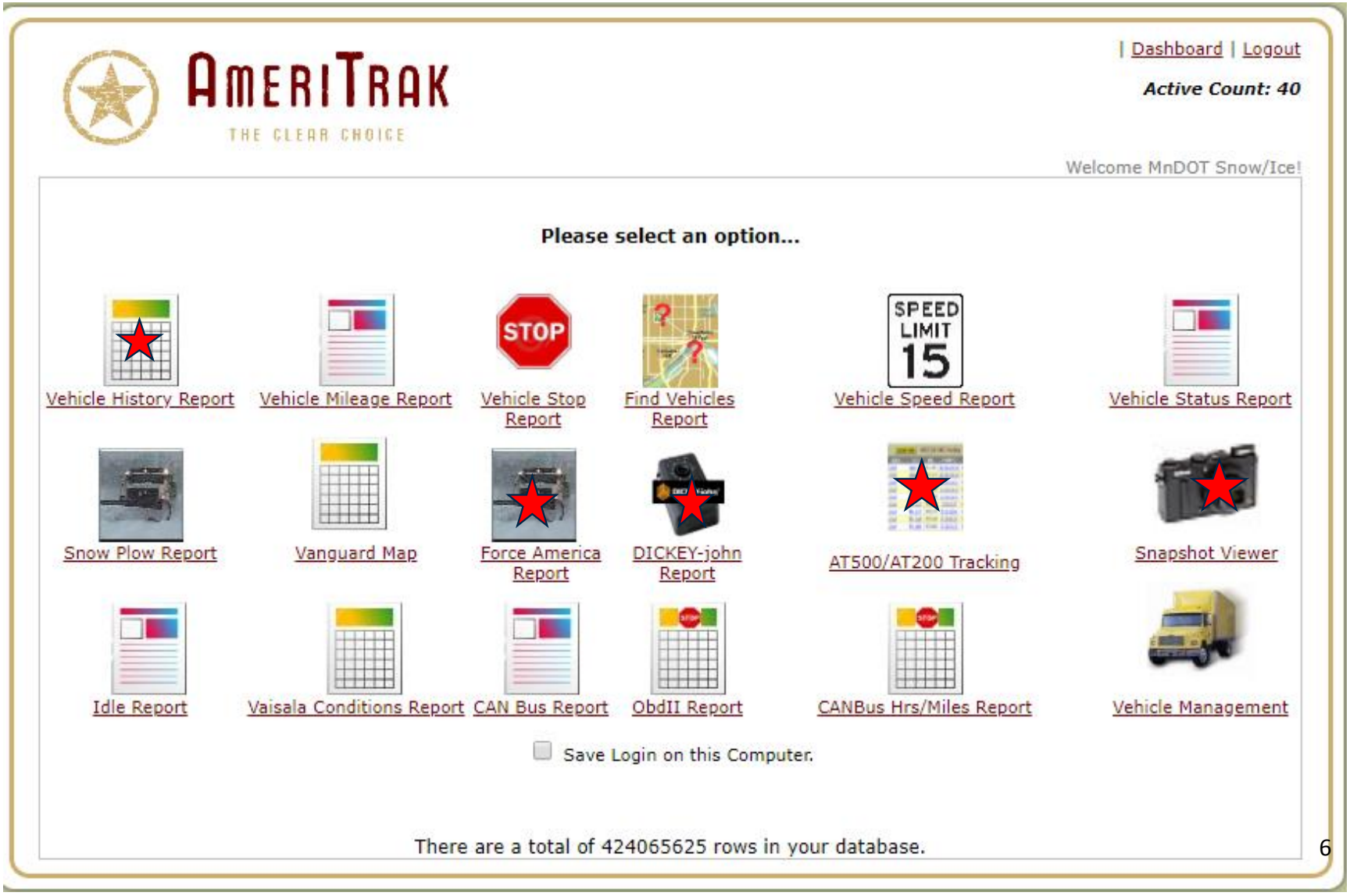
Integrates this info with FHWA, NWS, and MnDOT Private forecasters
Displays on 511

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

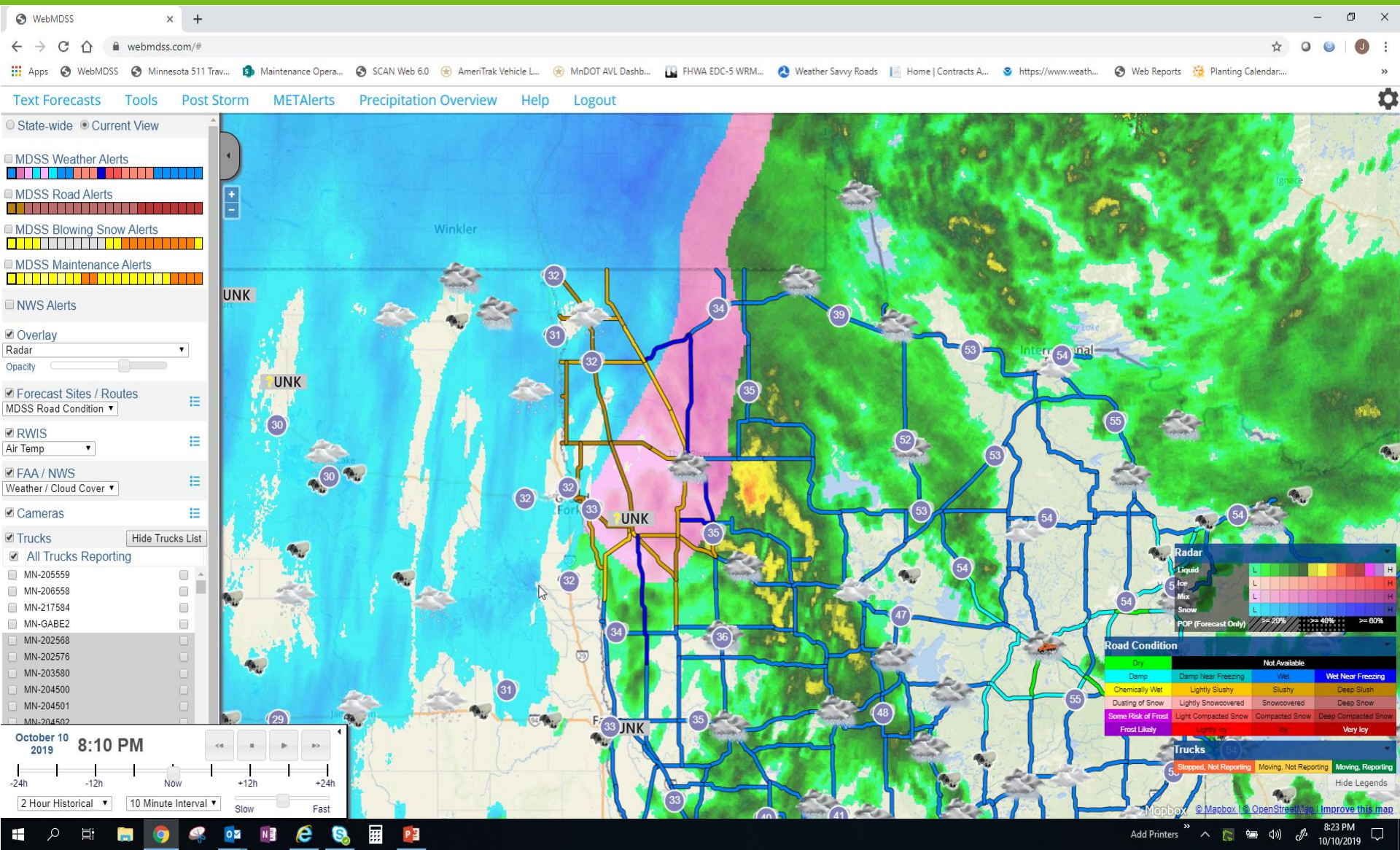
Collected Data



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.

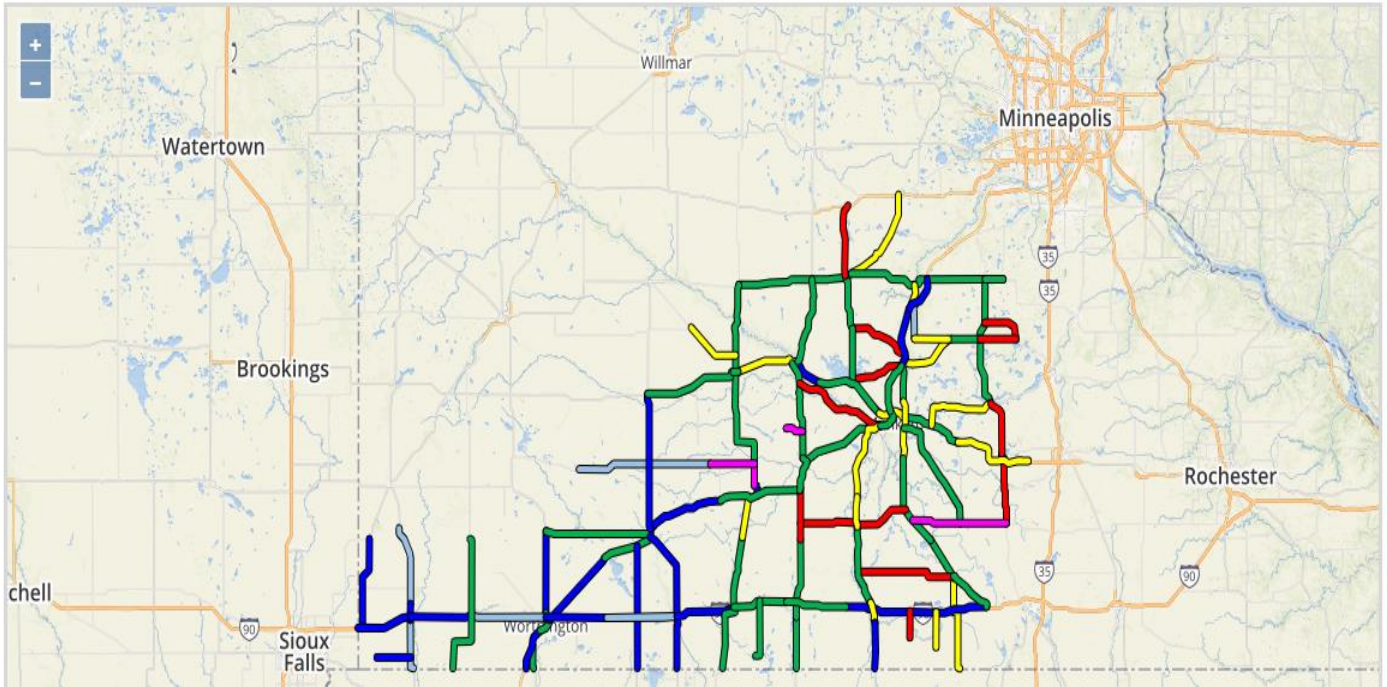
Reports Interface
Salt Usage vs. Recommended

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

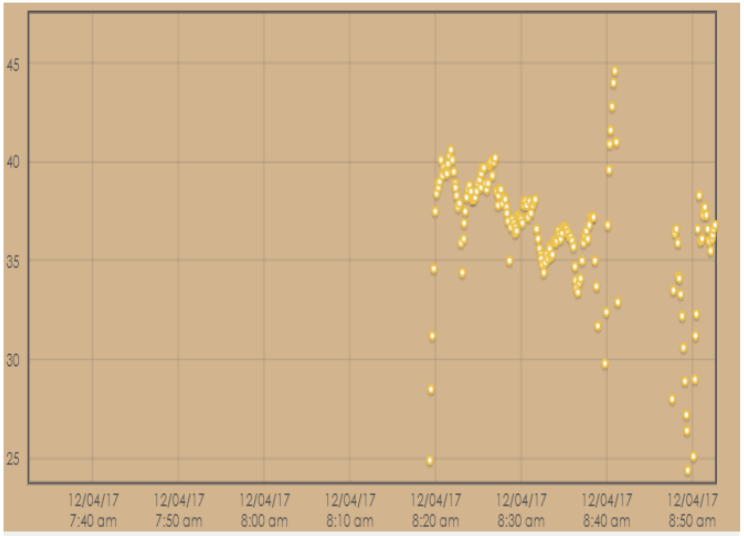
12/4/2017, 7:00:00 AM - 12/4/2017, 9:00:00 AM

Export to CSV

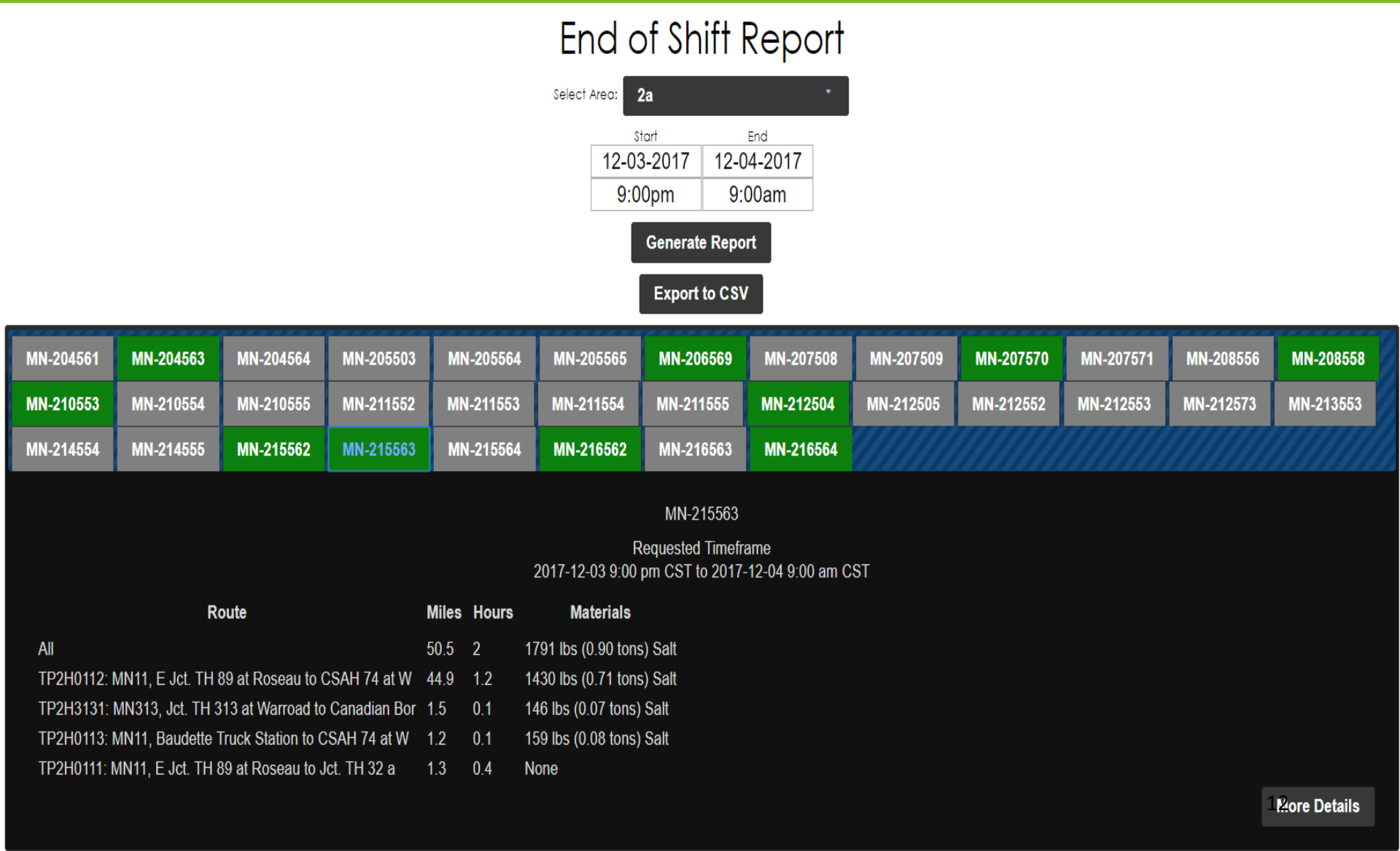
Statewide

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



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

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Thank you!

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