

VERMONT AGENCY OF TRANSPORTATION DISTRICT MAINTENANCE AND FLEET DIVISION

WATER QUALITY, STORMWATER MANAGEMENT AND WINTER ROAD TREATMENT PRACTICES

WAYNE B. GAMMELL, DIRECTOR

TODD C. LAW, DEPUTY DIRECTOR

JENNIFER CALLAHAN, STORMWATER TECH IV

2023 LEGISLATIVE SESSION

VTRANS WINTER SALT DASHBOARD FY22

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Vermont Agency of Transportation Winter Maintenance Activities

(Does not include Equipment)

Total Cost

\$17,909,898

District

All

Garage

All

Activity

All

Date

7/1/2021

6/30/2022

Hover over the date slicer and click the eraser icon to reset.

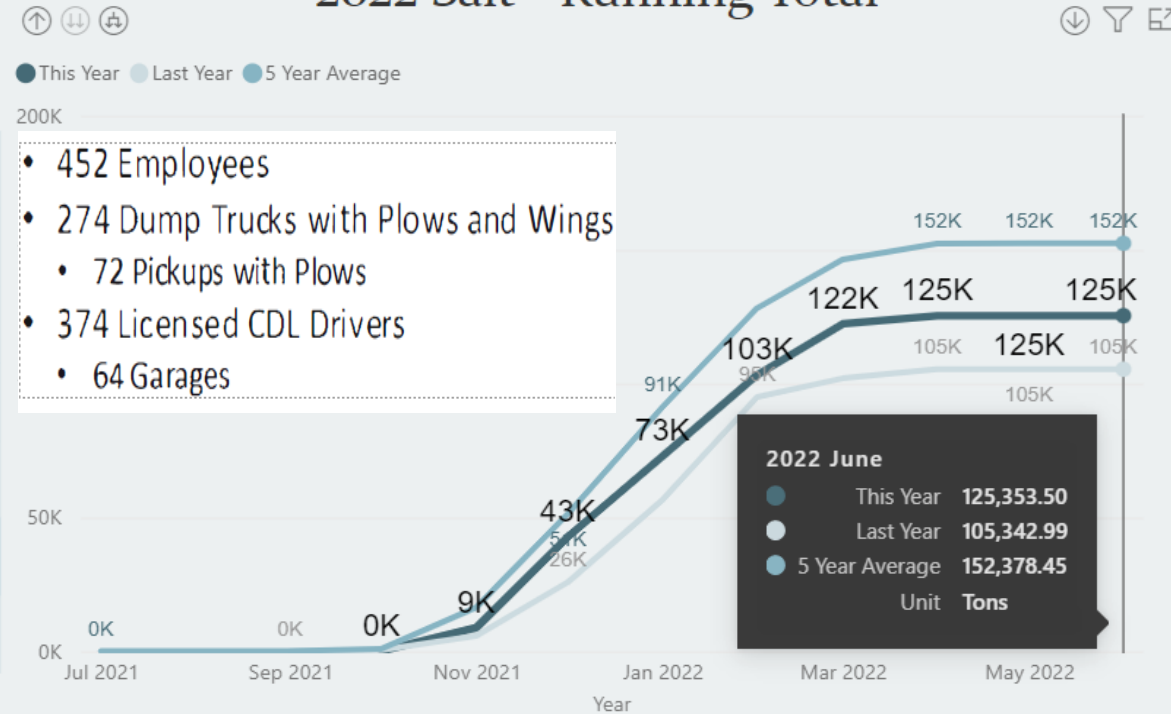


- Series
- Cost
 - Hours
 - Liquid Salt
 - Miles
 - Overtime
 - Salt**
 - Sand

Dimension: Cost, **Quantity**

Style: Total, **Running Total**

2022 Salt - Running Total



Lane Miles
1,661,136

Hours
379,210

Overtime Hours
88,523

Salt (Tons)
125,354

Liquid Salt (Gallons)
1,431,036

Sand (Cubic Yards)
3,112

2013

2014

2015

2016

2017

2018

2019

2020

2021

2022

2023

VTrans Road Salt Pricing FY23

	Estimated Salt Use	FY21 Results	Total w/ FY21 rates	FY22 Results	Total w/ FY22 Rates	FY23 Extension	Total w/ FY23 Rates
AOT 1	11,000	\$54.65	\$601,150.00	\$ 60.41	\$ 664,510.00	\$ 78.53	\$ 863,830.00
AOT 2	17,000	\$55.30	\$940,100.00	\$ 55.30	\$ 940,100.00	\$ 82.25	\$ 1,398,250.00
AOT 3	17,000	\$54.60	\$928,200.00	\$ 72.31	\$ 1,229,270.00	\$ 83.50	\$ 1,419,500.00
AOT 4	20,500	\$52.65	\$1,079,325.00	\$ 73.94	\$ 1,515,770.00	\$ 84.00	\$ 1,722,000.00
AOT 5	17,300	\$50.75	\$877,975.00	\$ 50.75	\$ 877,975.00	\$ 84.00	\$ 1,453,200.00
AOT 6	8,700	\$50.75	\$441,525.00	\$ 50.75	\$ 441,525.00	\$ 84.00	\$ 730,800.00
AOT 6	5,500	\$52.65	\$289,575.00	\$ 62.32	\$ 342,760.00	\$ 84.00	\$ 462,000.00
AOT 6	1,300	\$56.31	\$73,203.00	\$ 62.32	\$ 81,016.00	\$ 84.32	\$ 109,616.00
AOT 6	1,700	\$51.00	\$86,700.00	\$ 62.32	\$ 105,944.00	\$ 107.00	\$ 181,900.00
AOT 6	3,200	\$53.60	\$171,520.00	\$ 54.06	\$ 172,992.00	\$ 70.92	\$ 226,944.00
AOT 7	18,000	\$51.00	\$918,000.00	\$ 76.31	\$ 1,373,580.00	\$ 107.00	\$ 1,926,000.00
AOT 8	16,800	\$53.60	\$900,480.00	\$ 54.06	\$ 908,208.00	\$ 70.92	\$ 1,191,456.00
AOT 9	13,000	\$56.31	\$732,030.00	\$ 56.31	\$ 732,030.00	\$ 78.00	\$ 1,014,000.00
AOT TOTAL	151,000	\$53.32	\$8,039,783.00	\$ 60.86	\$ 9,385,680.00	\$ 84.50	\$ 12,699,496.00
		FY22 Anticipated Increases			\$ 1,345,897.00		
		FY23 Anticipated increases					\$ 3,313,816.00
		Total increase from FY21 to FY23					\$ 4,659,713.00

VTRANS SNOW AND ICE CONTROL PLAN

[Snow and Ice Control Plan.pdf \(vermont.gov\)](#)

MATERIALS

1. Road Salt (granular)

Road salt (Sodium Chloride) is the primary snow and ice control material. Road salt prevents snow and ice from bonding to the pavement surface and melts snow and ice that cannot be removed by plowing. Unless combined with other chemicals, sodium chloride is only effective down to approximately 15 degrees F. While rock salt is the most commonly used and cheapest deicer, it is harmful to both the environment and to physical structures. This is why the use of Best Management Practices (BMPs) to reduce the amount of overall salt used is imperative to our operations. (See Slide 6 for more on BMPs)

2. Liquids

- a) Liquid Salt is Sodium Chloride dissolved in water. This can be combined with commercially available deicing liquids and is a tool used to melt snow and ice more effectively, reduce the “scatter and bounce” and start the melting process immediately without the need for moisture.
- b) Liquid Magnesium Chloride is a commercially available deicing liquid used to melt snow and ice more effectively at lower temperatures and can be utilized with liquid salt to make liquid salt more effective at lower temperatures. Liquid Magnesium Chloride can include a corrosion inhibitor which makes it less corrosive than granular road salt- *we purchase this product with the corrosion inhibitor.*

3. Winter Sand

Winter sand is coarse, clean, sharp sand used to provide traction. It has no melting capabilities. Sand may be appropriate for steep hills, sharp curves, and some intersections where temporary traction is needed or when pavement temperatures are too low for salt to work properly.

Excessive use of sand can have detrimental impacts to the road and environment. Sand can insulate snow and ice and slow its melting. Sand can create roadway drainage issues, clog ditches and receiving waters, and is expensive to clean up in the spring. Much of the impairment of streams, rivers and brooks in Vermont is due to sediment impairment. Accordingly, the use of winter sand is generally minimized.

MATERIALS (CONT)

Consideration of other de-icing materials for snow and ice control.

- Salt alternatives work to reduce these negative impacts and could potentially provide more efficient snow and ice removal.
- Some salt alternatives like acetates, formates, and beet juice have been found to be more effective at lower temperatures when compared to chlorides.
- Acetates and Formates (primary used for airport runways because they are less corrosive than salt) cost \$1,433.25 - \$1,632.56/ Metric Ton
- Average Salt Usage – 151,000 tons = 137,024 metric tons (\$84.50/ ton = \$93.14/ MT)
- Using Acetates or Formates for de-icing roadways would cost \$196,389,648 in an average winter.
- Road salt average costs \$12.8M

VTRANS SNOW AND ICE CONTROL PLAN BEST MANAGEMENT PRACTICES

Chloride Reduction BMP	Definition	Potential % Chloride Reduction
Pre-Wetting	Application of liquids or proprietary chemical to dry salt as it is being applied to the roadway.	20% - 30%
Pre-Treating	Application of liquids or proprietary chemical to dry salt either before, during, or after it has been loaded into the truck.	10% - 30%
Anti-Icing	Application of liquids or proprietary chemical in advance of onset of winter storm in problem areas such as steep grades and curves.	10% - 30%
Equipment Calibration/ Ground speed control	Ensures equipment application of Chlorides is accurate. Ground speed control provides more accurate control over the salt application based on vehicle speed.	5% - 20%
In-Cab Air/Ground Temperature Sensor	Installation and monitoring of pavement and air temperature sensors with in-cab readout.	1% - 10%
Training, Storage and Handling	Annual training of staff about various BMPs, improving storage and handling practices for loading and unloading salt.	10% - 25%

[W~Corrina Parnapy~Major Impacts of Road Salt~1-19-2017.pdf \(vermont.gov\)](#)

CLEAR ROADS SALT USE VS WINTER SEVERITY FY22

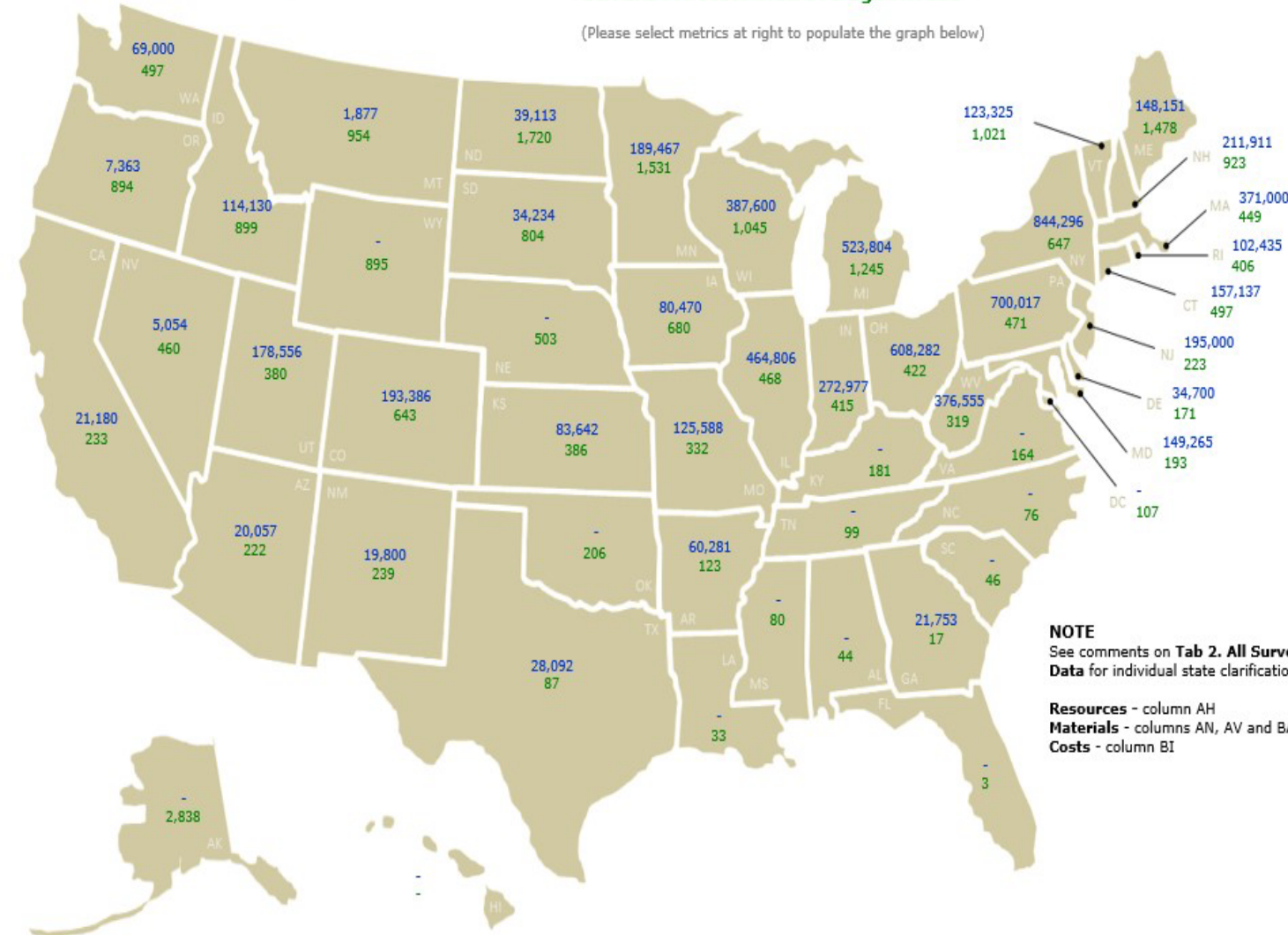


State Winter Maintenance Data and Statistics

Winter 2021-22
DRY MATERIALS: Salt applied (tons)

Winter 2021-22
SEVERITY: Statewide average AWSSI

(Please select metrics at right to populate the graph below)



NOTE
 See comments on **Tab 2. All Survey Data** for individual state clarifications:
Resources - column AH
Materials - columns AN, AV and BA
Costs - column BI

Timeframe for Blue Metric

- Winter 2021-22
- Winter 2020-21
- Winter 2019-20
- Winter 2018-19
- Winter 2017-18
- Winter 2016-17
- Winter 2015-16
- Winter 2014-15
- 5-Year Average (2017-18 to 2021-22)
- Change 2020-21 to 2021-22
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Blue Metric to Map

- SYSTEM: Total lane miles
- HUMAN RESOURCES: State workers (full-time)
- HUMAN RESOURCES: State workers (part-time and seasonal)
- VEHICLE RESOURCES: Plow trucks (owned and contracted units)
- VEHICLE RESOURCES: Road graders (owned and contracted units)
- VEHICLE RESOURCES: Blowers (owned and contracted units)
- FACILITY RESOURCES: Salt storage facilities (count)
- FACILITY RESOURCES: Salt storage capacity (tons)
- FACILITY RESOURCES: Liquid storage facilities (count)
- FACILITY RESOURCES: Liquid storage capacity (gallons)
- DRY MATERIALS: Salt applied (tons)**
- DRY MATERIALS: Total chemicals applied (tons)
- DRY MATERIALS: Abrasives (non-chemical) applied (tons)
- LIQUID MATERIALS: Salt brine applied (gallons)
- LIQUID MATERIALS: Total liquid applied (gallons)
- COST: Total labor cost (\$)
- COST: Total equipment cost (\$)
- COST: Total materials cost (\$)
- COSTS: Snow and ice total expenditure (\$)
- COSTS: Average salt price mid-winter (Jan. 1) (\$/ton)
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- (Do not display a second parameter)

CLEAR ROADS SALT USE VS LIQUIDS USE FY22



State Winter Maintenance
Data and Statistics

Winter 2021-22
DRY MATERIALS: Salt applied (tons)

Winter 2021-22
LIQUID MATERIALS: Total liquid applied (gallons)

(Please select metrics at right to populate the graph below)



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Wayne Gammell, Director
Wayne.Gammell@vermont.gov or 802-461-7291

Todd Law, Deputy Director
Todd.Law@vermont.gov or 802-839-0274