



# Caleb Dobbins

City of Manchester

**Afternoon Speaker August 2**

*I am an Environmentalist*

*I Want to Cut Trees*





**I Am An Environmentalist**

**I Want To Cut Trees**

**2023 Salt Symposium**

**August 2, 2023**

**Caleb B. Dobbins, PE  
Chief Highway Engineer  
City of Manchester, NH**



# The Good Old Days



- **1941-First direct application of salt in US was on roads in New Hampshire**

# Stool of Sustainability



# RWIS System



# Rte 106 Loudon NH- 3/10/2023

▼ NHDOT-Rt.106 Loudon (show station on map)

**Coordinates**

71° 27' 3" W 43° 24' 16" N

**Altitude**

582 ft

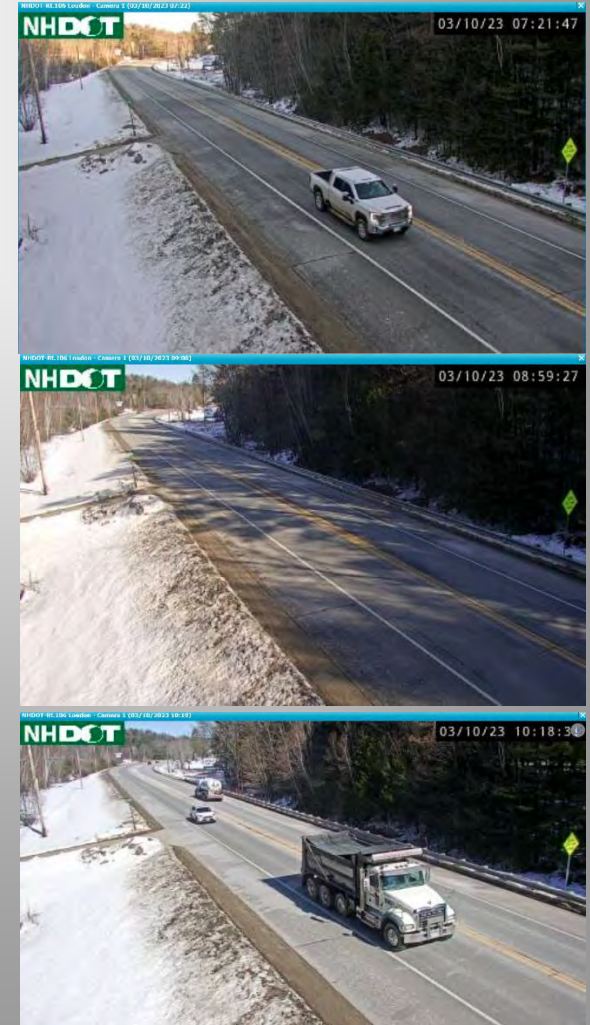
**Nearest stations**

NHDOT-Canterbury I-93	8.3 mi
NHDOT-Sanbornton I-93	9.6 mi
NHDOT-Rt. 4 WB Northwood	16.3 mi
NHDOT-Bow	16.9 mi
NHDOT-Warner I-89	21.0 mi

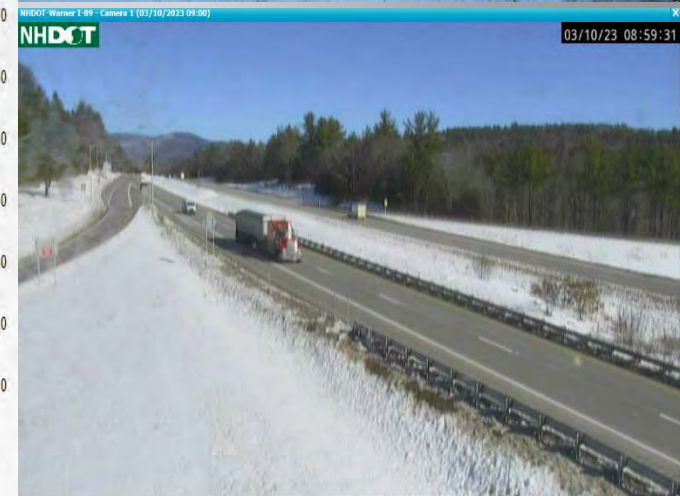
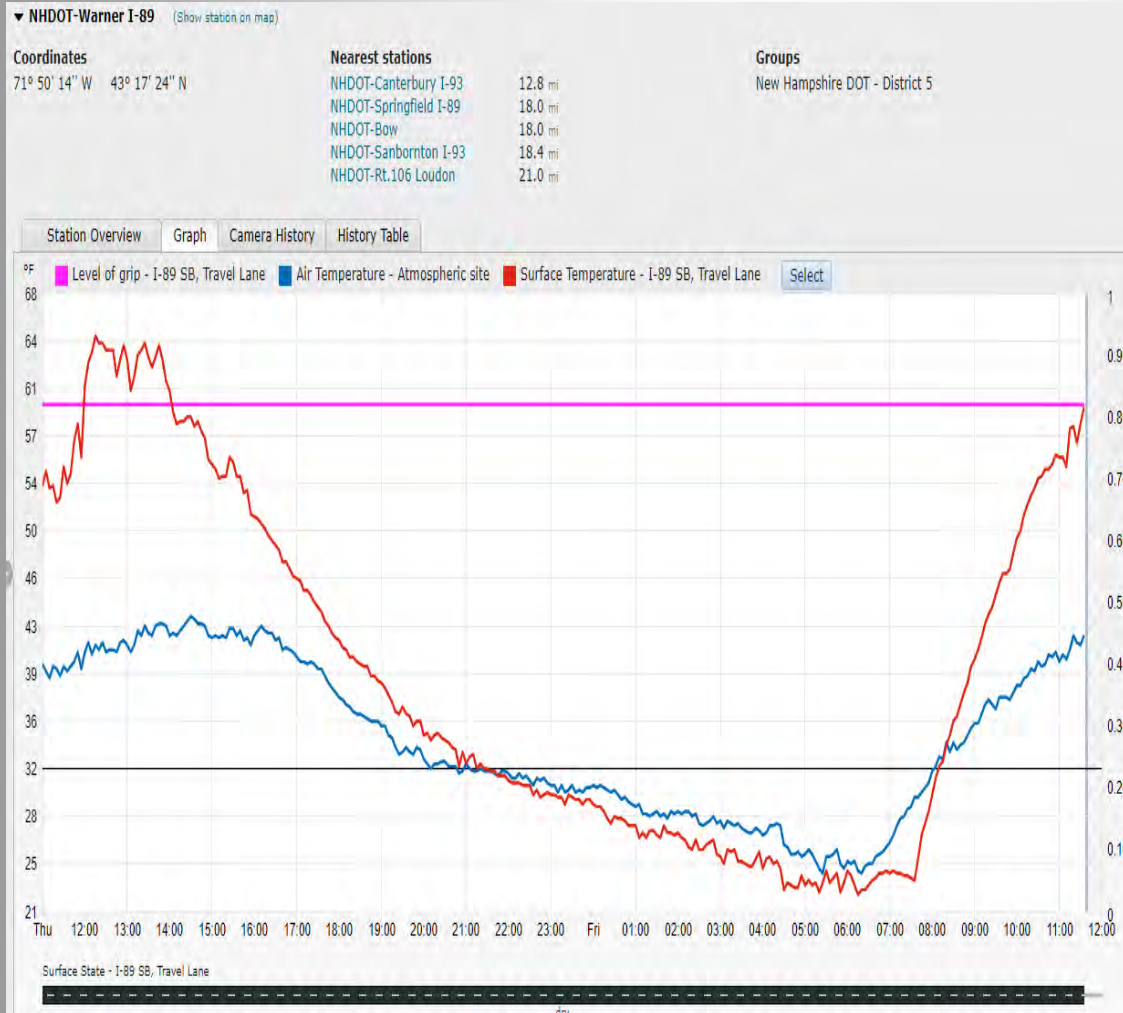
**Groups**

New Hampshire DOT - District 3

Station Overview Graph Camera History History Table



# Warner I-89 Exit 9- 3/10/2023



# By the #'s

**VAISALA**

**Observations for NHDOT-Rt.106 Loudon**

03/09/2023 00:00 → 03/10/2023 00:00

Timestamp	Surface Temperature (°F) Surface site 1	Surface State Surface site 1	Air Temperature (°F) Atmospheric site	
03/09/2023 06:00	26.6	dry	26.8	-0.2
03/09/2023 06:30	26.6	dry	26.4	0.2
03/09/2023 07:00	27.7	dry	27.1	0.6
03/09/2023 07:30	28.8	dry	28.6	0.2
03/09/2023 08:00	30.2	dry	30.4	-0.2
03/09/2023 08:30	31.5	dry	32	-0.5
03/09/2023 09:00	31.1	dry	33.8	-2.7
03/09/2023 09:30	34.9	dry	35.1	-0.2
03/09/2023 10:00	40.3	dry	37.4	2.9
03/09/2023 10:30	42.4	dry	38.5	3.9
03/09/2023 11:00	42.4	dry	38.7	3.7
03/09/2023 11:30	49.5	dry	39.9	9.6
03/09/2023 12:00	50.5	dry	40.8	9.7
03/09/2023 12:30	54.5	dry	41.4	13.1
03/09/2023 13:00	57.4	dry	41.9	15.5
03/09/2023 13:30	50	dry	41.9	8.1
03/09/2023 14:00	47.3	dry	42.4	4.9
03/09/2023 14:30	50.4	dry	42.4	8
03/09/2023 15:00	48.9	dry	43	5.9
03/09/2023 15:30	47.8	dry	43.3	4.5
03/09/2023 16:00	47.1	dry	43	4.1
03/09/2023 16:30	45.3	dry	42.1	3.2
03/09/2023 17:00	43.9	dry	41.2	2.7
03/09/2023 17:30	42.4	dry	40.3	2.1
03/09/2023 18:00	40.1	dry	38.5	1.6



# By the #'s

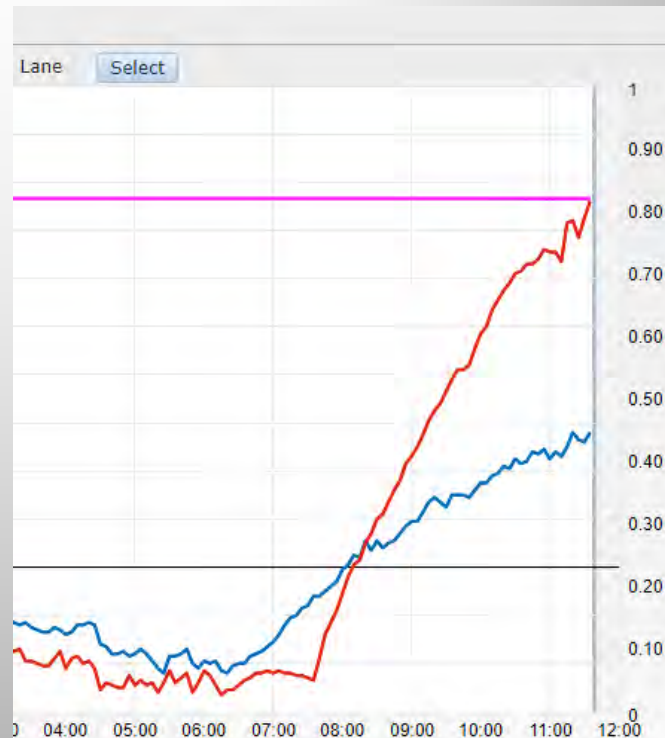
**VAISALA**

**Observations for NHDOT-Warner I-89**

03/09/2023 00:00 → 03/10/2023 00:00

Timestamp	Surface Temperature (°F) I-89 SB, Travel Lane	Surface State I-89 SB, Travel Lane	Air Temperature (°F) Atmospheric site	Surface Temp- Air Temp
03/09/2023 06:30	26.1	dry	30	-3.9
03/09/2023 07:00	27.3	dry	30.6	-3.3
03/09/2023 07:30	28.2	dry	31.1	-2.9
03/09/2023 08:00	31.8	dry	32.5	-0.7
03/09/2023 08:30	34.2	dry	33.4	0.8
03/09/2023 09:00	37	dry	34.3	2.7
03/09/2023 09:30	41.2	dry	35.6	5.6
03/09/2023 10:00	47.7	dry	37.2	10.5
03/09/2023 10:30	48.4	dry	37.6	10.8
03/09/2023 11:00	53.4	dry	39.9	13.5
03/09/2023 11:30	54.9	dry	39.7	15.2
03/09/2023 12:00	61	dry	40.8	20.2
03/09/2023 12:30	63.7	dry	40.8	22.9
03/09/2023 13:00	63	dry	41.4	21.6
03/09/2023 13:30	63.1	dry	42.3	20.8
03/09/2023 14:00	60.6	dry	42.1	18.5
03/09/2023 14:30	58.6	dry	43.5	15.1
03/09/2023 15:00	55	dry	41.9	13.1
03/09/2023 15:30	55.2	dry	42.6	12.6
03/09/2023 16:00	51.1	dry	42.1	9
03/09/2023 16:30	48.9	dry	41.7	7.2
03/09/2023 17:00	46.4	dry	40.5	5.9
03/09/2023 17:30	44.2	dry	39.6	4.6
03/09/2023 18:00	41.7	dry	37.4	4.3
03/09/2023 18:30	39.9	dry	36.1	3.8
03/09/2023 19:00	38.5	dry	35.2	3.3
03/09/2023 19:30	36.7	dry	33.3	3.4
03/09/2023 20:00	34.5	dry	32.7	1.8
03/09/2023 20:30	34.2	dry	32.5	1.7
03/09/2023 21:00	32.4	dry	32.4	0
03/09/2023 21:30	32	dry	31.8	0.2
03/09/2023 21:35	31.8	dry	31.8	0

# Timing, Timing, Timing



# Shade Removal- Before / After



# Shade Removal- Connecticut



# Helpful Guidance

- **Identify your tree species- Shade in the summer is different than the winter depending on tree species (Evergreen versus Deciduous)**
- **Most beneficial cardinal direction of slopes (South and East slopes for clearing)**

# Southerly vs. Northerly Slopes



# Can't Manage What You Don't Measure

- If you are over performing then most likely you are expending more money and damaging the environment to a greater extent than required.

<http://www.trb.org/Main/Blurbs/178901.aspx>

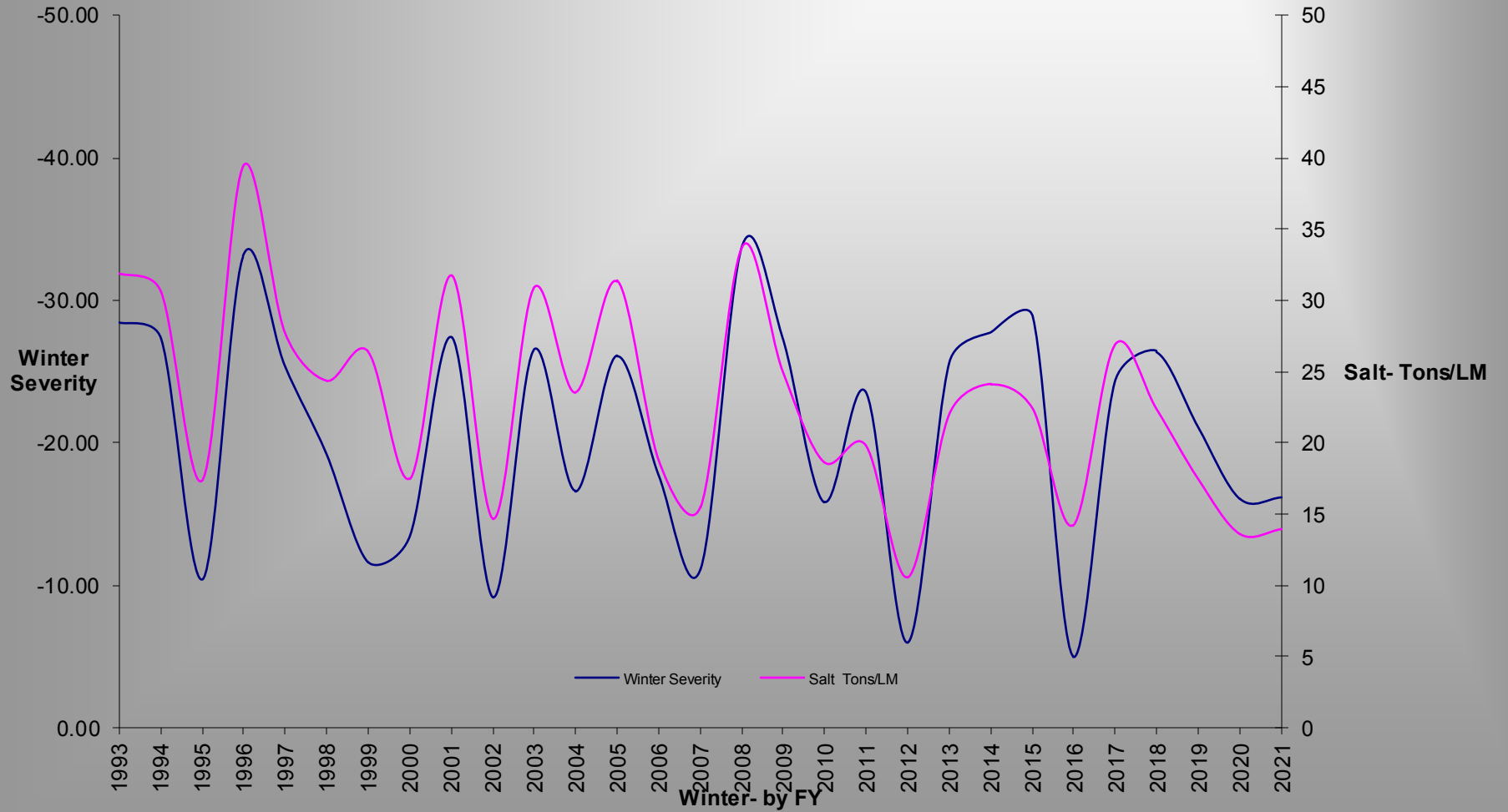
Or Google:

NCHRP Winter Performance Measures



# Winter Severity vs. Salt Usage

Derry- PS 528  
*Winter Severity and Salt Use*







# Winter Severity vs. Salt Usage

Derry- Patrol Shed 528

FY	Average WI	Salt Usage-Total Tons	MOA Formula	Lane Miles	Salt Usage-Tons/LM	Predicted Usage/LM	% Diff/LM
1993	-28.47	3285	3383	103.16	31.8	32.8	-2.9%
1994	-27.36	3155	3277	103.16	30.6	31.8	-3.7%
1995	-10.45	1800	1665	103.16	17.4	16.1	8.1%
1996	-33.09	4065	3823	103.16	39.4	37.1	6.3%
1997	-25.40	2860	3091	103.16	27.7	30.0	-7.5%
1998	-19.23	2510	2502	103.16	24.3	24.3	0.3%
1999	-11.64	2725	1779	103.16	26.4	17.2	53.2%
2000	-13.43	1805	1950	103.16	17.5	18.9	-7.4%
2001	-27.39	3275	3280	103.16	31.7	31.8	-0.1%
2002	-9.14	1510	1541	103.16	14.6	14.9	-2.0%
2003	-26.48	3180	3193	103.16	30.8	31.0	-0.4%
2004	-16.61	2425	2253	103.16	23.5	21.8	7.6%
2005	-26.10	3235	3157	103.16	31.4	30.6	2.5%
2006	-17.67	1930	2354	103.16	18.7	22.8	-18.0%
2007	-11.11	1599	1729	103.16	15.5	16.8	-7.5%
2008	-33.89	3480	3900	103.16	33.7	37.8	-10.8%
2009	-27.41	2584	3282	103.16	25.0	31.8	-21.3%
2010	-15.87	1921	2182	103.16	18.6	21.2	-12.0%
2011	-23.57	2041	2916	103.16	19.8	28.3	-30.0%
2012	-6.05	1135	1294	107.05	10.6	12.1	-12.3%
2013	-25.71	2442	3355	110.94	22.0	30.2	-27.2%
2014	-27.82	2767	3697	114.83	24.1	32.2	-25.2%
2015	-28.88	2651	3938	118.71	22.3	33.2	-32.7%
2016	-5	1741	1363	122.60	14.2	11.1	27.8%
2017	-24.27	3395	3658	126.49	26.8	28.9	-7.2%
2018	-26.42	2953	4079	132.00	22.4	30.9	-27.6%
2019	-21.15	2447	3645	140.00	17.5	26.0	-32.9%
2020	-16.1	1965	3077	144	13.6	21.4	-36.1%
2021	-16.2	2490	3820	178	14.0	21.5	-34.8%

01/17/2017 21:42:28



**Any Questions?**

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