



Streets Division Snow Response

Salting Operations

Charlie Romines Streets Division Superintendent





Salt Routes

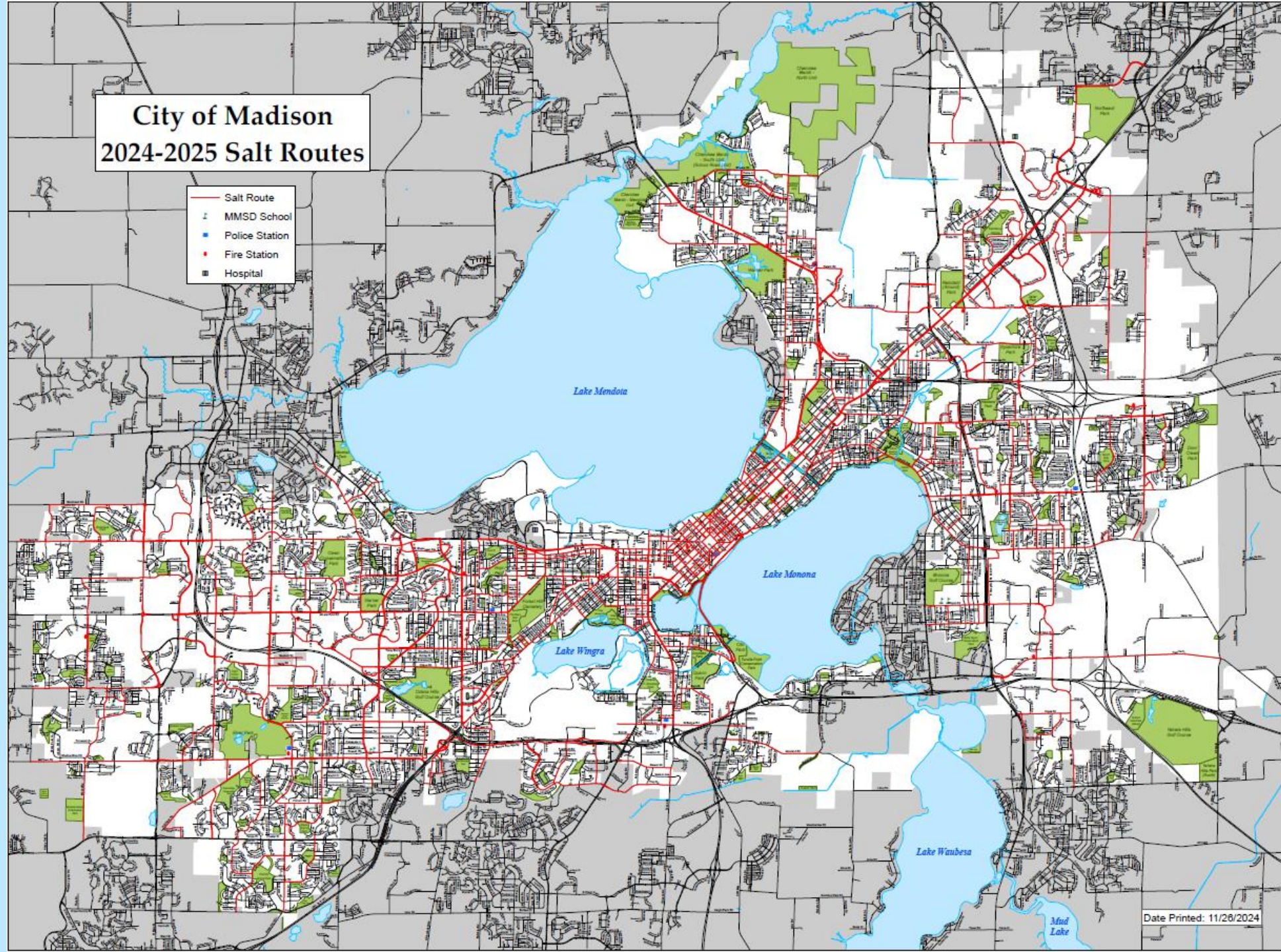
What are salt routes?

782 miles of traffic lanes that make up the main thoroughfares.

32 individual trucks cover these routes. Each truck takes roughly 3 hours to complete 1 lap through route under best case conditions.

Used by Metro Buses, near schools, near emergency services (hospitals, fire stations, etc.)

Map is available at www.cityofmadison.com/winter



The Trouble with Salt

- All the salt put down on sidewalks, parking lots, and roads finds its way into our waters
- Enters the storm drains and out into our lakes & infiltrates our drinking water.
- This has been a known problem *for decades*. See the article in the photo from 1977.
- We **must** be cautious with salt

City wells fail to meet EPA salt standards

By WHITNEY GOULD
Of The Capital Times Staff

Although the city has cut back drastically on its use of de-icing road salt in recent years, the water in several Madison wells still contains salt concentrations above the level at which the Environmental Protection Agency recommends a warning for the sake of hypertension sufferers, University of Wisconsin researchers have found.

Dan Willard, the environmental studies professor who did the study, thinks the city probably should alert residents whose water comes from the affected wells. But City Health Director Karl Mohr says that would upset people needlessly when there is no real cause for alarm.

Using data collected by the city, Willard, Prince Beach and Tim Diehl traced the rise in sodium and chloride levels in 13 of the city's 27 wells between 1951 and 1975.

The increases, also reflected in the water in our lakes, parallel what until recently was a continuous growth of road salt use dating back to the '50s, Willard concluded. Much of the salt flushed off the streets seeps through soil into ground water which is the source of our drinking water.

The most dramatic jump was in Well No. 5 on North Randall Avenue, where sodium levels rose from three to 25 parts-per-million (ppm) in the 24-year period and chloride escalated from 19 to 55 ppm.

Two other wells of 14 tested had sodium levels above 20 ppm, the level at which the EPA advises a warning for those with high blood pressure, which is linked to the water-retention properties of sodium.

They were Well No. 2 on Vilas Avenue and Well No. 17 on South Hancock Street, according to Willard. Well No. 2 near Lake Wingra showed an increase in sodium from 10 ppm in 1951 to 35 ppm in 1972 and an increase in chloride of 3 ppm in 1951 to 23 ppm in 1975.

(The wells throughout the city are all interconnected. But in most cases, people living in a given area are getting their water from the nearest well, according to Water Utility officials.)

The elevated salt levels are well
(Continued on Page 4, Col. 3)

MADISON, WIS., Monday, June 27, 1977

City wells rather salty

(Continued on Page 4, Col. 3)

within the 250 ppm safety limit set by the U.S. Public Health Service for drinking water, and Willard stresses there is "no cause for alarm."

But he thinks it might be a good idea for the city to include a note in the water bills of people whose water supply comes from the affected wells, to alert those on low-salt diets.

"It probably should be something more than the warnings on cigarette packages, which nobody pays any attention to, and something less than 'Everybody should get out of town,'" he said.

But Mohr said he saw no need for such a notice. "I hate to do something like that unless it's absolutely necessary," he said. "In many cases you just alarm people for no reason. And in most instances where people have been diagnosed as hypertensive, their physicians are taking these things into account" in recommending limits on salt intake.

City Water Utility Manager Larry Russell agrees with Mohr. "Any kind of a general warning would be more of a scare than anything else," he says, noting, however, that at one point the city did send out a note to dieticians advising them of the rise in salt levels.

At the current levels, a person would have to consume huge quantities of water to be affected by the salt content, Russell said, and short of drinking distilled water, there's not much that anybody can do about the situation.

But Russell added that the city is watching the salt figures as indicators of ground water quality.

In the meantime, warns Russell, a larger health hazard for some people is softened drinking water, which contains salt concentrations as high as 100 ppm.

In most cases, the cold water coming out of a home faucet is not softened. But city inspectors, according to Russell, occasionally come upon a home where a water softener has been attached directly to the incoming water line, thus adding softening salts to the drinking water as well as that used for washing.

"It's not a large problem," he said, "but there probably are some people who are drinking softened water and don't know it."

Willard expects salt concentrations in the wells to decline in the next few years, to reflect reductions in the use of road salt. But it won't happen right away, he said, because ground water moves very slowly.

In the winter of 1972-73, the city dumped some 3,891 tons of de-icing salt on its streets, according to streets supervisor Lloyd Sarbacher. Concern about salt contamination prompted the City Council to order a program of gradual reduction. And by last winter, salt use had been cut back to 1,519 tons — a drop of 73 per cent.

"A rare example of protective legislation in time," Willard said of the salt cutbacks.

Salt Problems Isn't a Uniquely Madison Problem

The Washington Post

Scientists have found a 'sleeping giant' of environmental problems: Earth is getting saltier

Salt used to de-ice roads is the single biggest source of salt in the U.S.

October 31, 2023

milwaukee **journal sentinel** Wisconsin waters have a road salt problem. Here's what to know, and how to help.

Jan. 14, 2025

Kitchener-Waterloo



Reducing road salt use 'not something that can wait' as Ontario lakes see oxygen depletion, researcher says

Waterloo region's salt philosophy is 'applying the right amount in the right area,' manager says

Nov 26, 2023

Detroit Free Press

Michigan lakes are getting saltier; road salt to blame

If trend continues, study predicts, salt levels will present risk to aquatic ecosystem in inland lakes

April 13, 2017

How the Streets Division Controls Salt Use

- Operators go through salt usage trainings
- Careful evaluation of which streets are salted
- Deploying what is appropriate for road conditions & temperatures
- Pre-treating roads when possible with saltwater brine
- Salt scales



What Salt Routes Look Like (Eventually)

Salt, time, temperature, and traffic combine to help make roads free from snow (mostly).

This is Olin Ave between S. Park Street and John Nolen Drive.



When it's it's too cold to salt.

This is Colony Drive between Inner and Gammon. It's part of the salt route for John Muir Elementary. Sand was used for traction since temperatures were below 20 degrees.



Magnesium Chloride (New for 2024-2025)



This is a plowed residential street.





Streams and Rivers

Bodies of water in Dane Co are chloride impaired, as defined by the Wisconsin DNR.

Local Name

Pheasant Branch (segments 1 & 2)

Starkweather Creek (segment 1)

W. Br. Starkweather Creek (Airport Road Creek) (segment 1)

Yahara River (segment 6)



Chloride Effects on Vegetation





Chloride Effects on Infrastructure

Road salt corrodes steel and damages pavement leading to costly repairs to infrastructure including pothole patching and repaving.



Life cycle cost of 1 ton of salt 800 - \$3300



Other Potential Chloride Cost

Madison Metropolitan Sewage District:

They must meet a chloride discharge standard.

Removing chloride at the plant is estimated to cost

\$400 million to \$1.3 billion

Rate increase of 50%-500%

<https://www.pca.state.mn.us/sites/default/files/wq-iw11-06bb.pdf>





www.cityofmadison.com/Winter

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