St. Louis Park
MINNESOTA
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City of St. Louis Park Salting Strategies

The City of St. Louis Park has developed a strategy on salt usage in its winter maintenance plan. According to Environmental Protections Agency standards and the Minnehaha Creek Watershed District, a higher chloride level has been noticed in Minnehaha Creek that is contributed by salt usage. As a result of increased public sentiment of environmental and costs (taxes) concerns, the City of St. Louis Park has created a plan to reduce the amount of chlorides released into the creek, while still providing the traveling public a safe, cost-effective driving surface.

Salt tracking equipment

The city closely monitors the amount of salt applied to all streets and parking lots throughout the city. Using Automated Vehicle Location (AVL) the city can monitor how much salt is being applied, as well as where it was applied. We can then adjust application rates of salt using real-time data to be most effective for both cost and environmental concerns.

Proactive prior to snow events by "anti-icing"

When appropriate, the city will apply a diluted liquid (23% salt brine) to the streets prior to a snow event. This is the faint white lines you may see on the street a day or two before a storm. Anti-icing has proven to help prevent the bond between the driving surface and the ice buildup or hard pack during a snow event. This allows for easier snow removal and use of less salt during the storm. It must be applied to a dry road surface prior to storm. If applied on a wet surface or freezing rain, the solution is diluted and the product becomes ineffective.

Pre-wetting salt

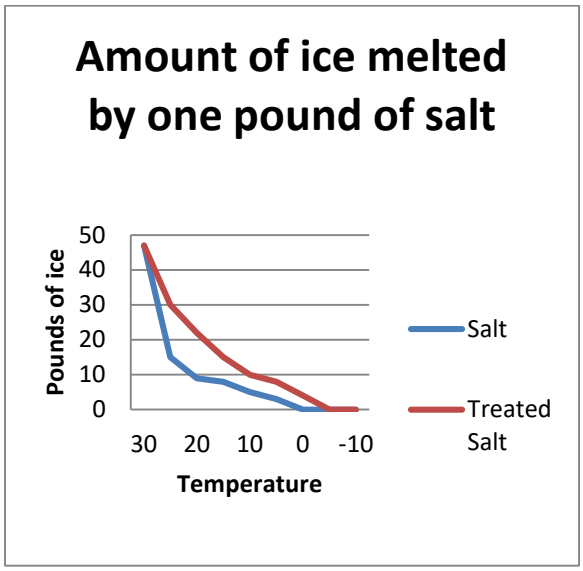
Wetting the salt provides additional moisture to start the brine making process. City trucks carry between 100-180 gallons of salt brine in tanks attached to the plow truck. By introducing a 23% solution of salt brine into the sander to mix and coat the salt with liquid prior to hitting the streets helps to:

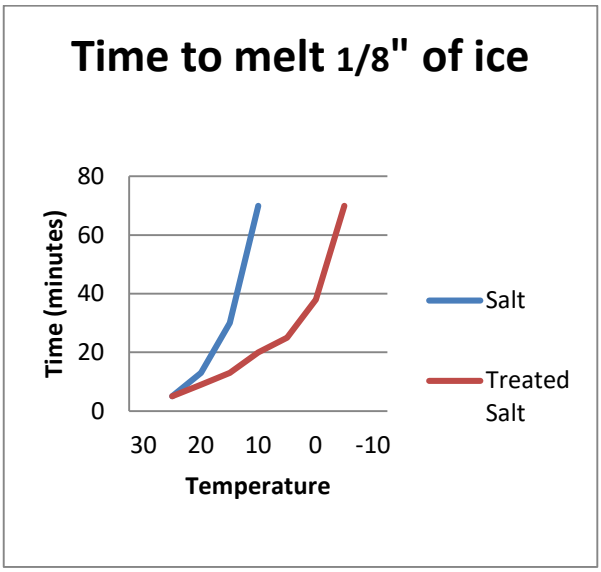
1. Prevent bounce and scatter. It keeps more salt in the drive lanes where it is needed to create the brine instead of bouncing into the gutter where there is no value.
2. Jump start the brine making process, making the salt work more quickly.

Deicing chemicals work by lowering the freezing point of water.

Salt, the most common deicer, uses moisture from water, snow or slush on the road surface to create the brine solution to begin the melting process. The effectiveness of salt in removing ice and snow from roads depends on several factors, including the moisture content of the snow, chemical concentration, pavement temperature, weather conditions, pavement type, traffic volume and width of application. The city uses accepted industry guidelines which determine the amount of salt required to create brine for various weather conditions.

The concentration of the brine and the temperature of the pavement are key variables in determining whether and how fast the salt will work. When salt dissolves in water, the resulting brine is generated at a saturation level, 25-26%. The brine can be quickly diluted by the snow or ice it contacts. As it becomes diluted, there is less salt to lower the water's freezing point, and the freezing point will rise. If temperatures continue to fall, the loss of melting power accelerates and the amount of salt needed create the brine to melt snow and ice increases significantly. Multiple applications of salt may be required to keep the brine solution at 25% to continue the melting process.





Fact: Salt can melt four times as much ice at 30 degrees as at 20 degrees. The colder it gets, the more time and material will be needed to get the same results.

15 degrees required for salt

The city uses a three-pronged approach to prevent or remove snow and ice from the roadways.

1. **Standard Road Salt** —Standard road salt is a great tool to use, but it is not a cure-all for all things icy and does not work well on its own. Salt is used citywide to create the brine needed with temperatures down to 15 degrees. The mixing action of vehicle traffic will spread this brine up and down the street to promote melting.

2. **Treated Salt** — Treated salt is used at temperatures below 15 degrees. The salt is treated with calcium chloride or magnesium chloride to help lower the freeze point of water to 0-5 degrees. A heat source (friction by traffic) is still needed to create the brine and promote melting. Treated salt is 30 percent more costly than standard road salt, so it is only used on main streets and intersections in the neighborhoods.

3. **Sand and Salt** — Once the temperature is below 0 degrees, a chemical/sand mix is used. It is the industry standard treatment for extended low temperature conditions (less than

0 degrees F). The sand provides an immediate improvement in traction, and the salt is available to melt the ice should pavement temperatures reach 15 degrees during the day. The sand/salt mixture is a temporary solution for, at best, a few hours before vehicle traffic will cause the mixture to move to the curb lines. Sand is also an environmental concern for the waterways, and must be swept up in the spring time to prevent it from entering the storm water system.

Why are some road bare and others not?

Higher volume roads, such as interstates or highways, have the greatest possibility to create the brine needed to melt snow and ice due to the number of vehicles that travel the roadway. Major streets throughout the city have less traffic volume than major interestates and highways, but there is still enough traffic to provide some melting below 15 degrees. Whereas residential streets have fewer than 100 cars a day, which is not enough traffic to create the brine needed to melt the snow and ice. Residential streets will stay hard packed until temperatures climb into the upper teens to low 20s, when the salt can use the sunlight or air temperatures to create the brine needed.