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MaineDOT Snow and Ice Control

Maine Department of Transportation

MaineDOT

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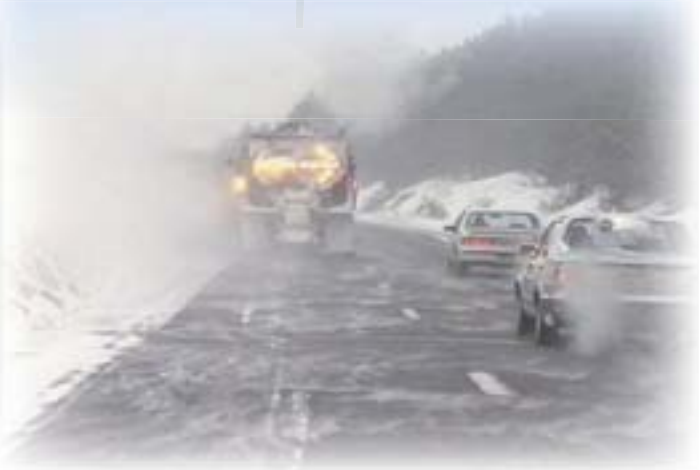
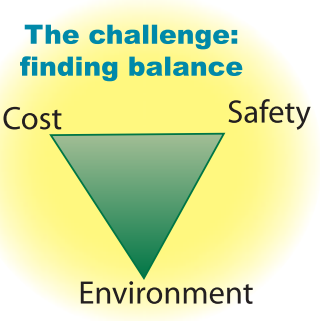


Snow and ice control

Over the past several years, MaineDOT has modified its approach to fighting winter storms. In previous years, an approach known as "de-icing" was primarily used. De-icing was characterized by allowing snow to accumulate on the roads, and then plowing the roads while spreading a mixture of sand and salt to provide traction. While this approach was generally effective, it often resulted in "snow pack"-snow and ice that bonded onto the road. Snow pack would often last for many hours, and sometimes days, after the end of a storm event, and crews would spend many hours of overtime using arge quantities of salt to remove it.

Today, MaineDOT uses a more proactive approach to fighting winter storms, known as "anti-icing." Anti-icing consists of using carefully calibrated equipment to spread a measured amount of salt early in a storm, and as necessary throughout, to prevent the snow and ice from bonding to the road. While anti-icing does require a much more technical approach to fighting winter storms, the end result is bare pavement much sooner after a storm has ended.



De-icing Vs. Anti-icing

De-Icing

- Mostly sand
- Higher operational costs
- Snow pack

Anti-Icing

- Mostly salt
- More technical approach
- Bare pavement sooner after storms

Pre-treating

What is MaineDOT spraying on the roads?

Recently, you may have noticed MaineDOT equipment spraying a liquid onto the pavement just prior to a storm. This is known as "pre-treating the roads" with salt brine. Salt brine is a 23% mixture of salt and water that will dry within approximately 45 minutes, leaving a thin, white film of salt that is ready to start working as soon as the first snowflake falls. Although salt brine has a freezing point of -6 degrees F, pre-treating is generally not used unless the pavement temperatures will be roughly 15 degrees F or higher.

A pretreated highway

The benefits of pre-treating lie in the efficiency and consistency of the salt application, as well as the initial benefit of having an entire highway corridor treated at the start of the storm. Plow trucks still need to continue to apply salt periodically throughout the storm, but salt brine pre-treating provides a good base.

Pre-wetting

Pre-wetting refers to the application of liquids onto either salt or sand as they are applied to the highway surface. Common pre-wetting liquids include: salt brine, liquid calcium chloride, and liquid magnesium chloride. The benefits of pre-wetting are:

- Keeps solid materials on the pavement
- Gets the salt acting more quickly
- Melts snow and ice at lower working temperatures
- Melts snow and ice with less salt

Primary materials used by MaineDOT

SALT (NaCl) Melts snow & ice and prevents bonding (15° +/- and up)	**SAND/SALT MIX** Provides traction (All temps)
SALT BRINE Consistent, early corridor treatment (15° +/- and up)	**CaCl / MgCl** Lower working temperatures (-25° / +5° and up)

Isn't sand a lot cheaper than salt?

No, not when you consider the full costs required right up to the time when the truck applies the materials. Sand is relatively inexpensive in the pit, but it must be screened, hauled off to the maintenance yard, mixed with salt (to keep it from freezing), and stored in a very large building. When we consider the high application rate, and the constant reapplication, we have a material that costs more than straight salt, even before spring clean-up costs are factored in. In short, sand certainly has a place in a snow and ice control program, but its costs cannot be overlooked.

Disadvantages of Abrasives (Sand):

- Good quality sand is scarce
- Sand has no ice-melting ability
- Sand use requires constant reapplication
- Sand can cause skidding on dry pavement
- Sand causes paint chipping and broken windshields
- Sand build-up creates major drainage problems
- Sand can smother roadside vegetation
- Sand contributes to air quality problems
- Sand causes siltation of waterways

The most important factor

While sand, salt, and other materials are important, the most important element in any snow- and ice-removal program is the plow. In fact, when storms are cold, (say, below 15 degrees F), often the best approach to fighting a storm is plowing alone- NO materials are applied. The reason is that snow, in cold temperatures, is usually very dry, (i.e. you cannot make a snowball), and it will either blow clear of the road or the plows will push it aside. Applying chlorides (including winter sand which has salt in it) in this type of weather will only cause snow to "wet up" and stick to the road, forming ice. If icing developes on the roads during a cold storm, the storm is then fought using salt and/or sand, combined with other materials, such as magnesium chloride and calcium chloride, to lower the effective working temperatures and help the grit remain on the road.

Last, but certainly not least...

The snow-fighting equipment and materials are worthless without the skill and dedication of the snow fighter. It is these men and women who spend their nights, week-ends, and holidays fighting winter storms, who truly keep the roads safe for us all.

Winter operations and the environment

Balancing safe winter travel with impacts to the environment is a priority for MaineDOT. We strive to minimize salt's adverse effects on the environment by using the latest technologies, providing training for drivers, reducing materials usage, and monitoring groundwater. With conversion to anti-icing resulting in a big reduction in sand use, roadside ditches are now able to handle stormwater runoff more efficiently, since they are virtually sand-free. Waterways no longer receive the annual surges of salt and sand that smother aquatic habitat. Reduction of airborne particulates from left-over sand improves air quality. Another benefit to using smaller amounts of sand is that smaller stockpiles are easier and less expensive to cover, making them safer for the environment.

MaineDOT has staff experts trained to deal with salt-related effects that occasionally result in landscaping, surface water, and ground-water impacts. The Water Resources Section of MaineDOT's Environmental Office responds to inquires about salt-related effects on properties along state-plowed roads, monitors long-term impacts of salt in the environment, and provides education and technical assistance for the dept.

Looking Back...

Obtain Winter Road Conditions with 511

Drivers should "Know Before They Go" by checking with MaineDOT's 511 traveler information system before taking to the road.

In 2003, the Maine Department of Transportation introduced the Maine 511 Travel Information and Alert system to help commuters and travelers access information regarding weather-related road conditions, accidents, delays, and construction, via the web or phone 24/7. With the 511 telephone line, travelers are able to access accurate, up-to-the-minute information about local highway and public transportation options, current travel/road conditions, and more.

Using the system is easy. Drivers simply dial 511 and follow the voice-activated prompts, or log on to our website *www.511maine.gov*, for important information.

More About 511 Travel Information Service

- No charge to land-based callers
- Normal airtime and roaming charges apply to wireless callers
- Coverage on all interstate & major routes
- Up-to-the-minute information - available 24/7
- Information for entire state, region, city or highway