

Less pollution
Safer roads
Lower Costs

What You Should Know About Safe Winter Roads and the Environment

FACTS ABOUT SALT:

Salt contaminates both reservoirs and wells used for drinking water.

Too much salt in streams can harm plants and animals.

Salt corrodes vehicles, road surfaces, and bridges, causing repairs which are not only costly but also have environmental consequences of their own.

Road maintenance crews use salt, sand, and other products to keep roads clear of snow and ice in the winter. But too much salt and sand can harm the environment and contaminate drinking water supplies. Numerous scientific studies indicate that salt and sand can pose health risks to people, plants and animals. Bridges, roads, and automobiles also suffer damage from salt use. With some simple techniques and new equipment, however, crews can use less sand and salt while making roads significantly safer.



What are the effects of salt and sand on the environment?

When spring rains and snowmelt occur, the salt that has accumulated over the winter is carried into storm water catch basins and streams. In surface waters, such as lakes, ponds, and streams, salt can harm or kill aquatic life, including fish and plants. Salt also attracts animals, including moose and deer, to the roadside, where they can be struck by traffic. Along the shoulders of roads, salt damages vegetation and soil, leading to erosion issues.

If salt reaches surface and underground drinking water supplies, it can cause problems in people with hypertension. It can also affect the taste of water and corrode plumbing infrastructure. Salt gets into the drinking water in two ways: it can collect in lakes and reservoirs, or it can infiltrate into the groundwater and contaminate wells. Once in the groundwater, salt remains there for decades.

Sand is easily moved to the side of the road by vehicular traffic, where it collects oil, grease, and other automotive byproducts. If it is collected, it may have to be disposed of as a hazardous waste. If it is not swept up, it clogs storm water catch basins and fills streambeds. It also clouds the water, hurting aquatic animals and leading to an increase in microorganisms. Sand is also ground into a fine dust by traffic. This dust can trigger respiratory problems like asthma.

Safety Concerns of Reduced Salt/Sand Use:

Municipalities justifiably want their roads to be as safe as possible. Because of this, the tendency to think that "more is better" can be difficult to overcome. But several recent studies have shown that by using new techniques, equipment, and chemicals, roads can actually be safer with less salt use. For instance, the city of Kamloops, BC,

STEPS YOU CAN TAKE TO IMPROVE WINTER ROAD MAINTENANCE

1

Train drivers and managers on low-salt techniques and equipment.

2

Calibrate spreading equipment and do spot-checks throughout the year.

3

Start applying salt before a storm hits to reduce waste and improve road safety.

Note: Find a complete list of New England Training centers on the back of this sheet

For more information:

[www.epa.gov/
adminweb/naturalevents/
snow-ice.html#highways](http://www.epa.gov/adminweb/naturalevents/snow-ice.html#highways)



1 Congress Street
Suite 1100
Boston, MA 02114-2023

continued ➔

Canada, saw an overall 8% decrease in accidents after changing to low-salt application techniques. When transportation officials in Idaho switched to liquid magnesium chloride on one stretch of road, the number of accidents fell by 83%. Just as remarkably, that same stretch of road saw crews putting out 83% less salt and sand. Not every story will be this successful, but both travelers and the environment win when municipalities make changes that keep roads bare and use fewer materials.

Recommended actions to reduce salt and sand applications:

Every member of a winter maintenance team can benefit from the training programs offered in every state by the local Technology Transfer center. They will often teach a program known as the “4 R’s.”

- 1. Use the Right Material.** Stop using sand, except for low-speed intersections, curves, and hills. Use a chemical that is effective at current road surface temperatures. Consider using alternate chemicals on bridges and in source water protection areas.
- 2. Use the Right Amount.** The number one factor in applying salt is the surface temperature. Warmer roads need less salt. Consider purchasing inexpensive infrared thermometers for spreading trucks.
- 3. Apply at the Right Place.** Put salt down where it will do most good. Hills, curves/corners, shaded sections of road, bridges, etc., need special attention. A section of road with a surface temp below ~10° F won't benefit from rock salt. Use another chemical instead. Designate sensitive areas as low or no salt zones.
- 4. Apply at the Right Time.** Apply as early as possible! Obtain and use the most up-to-date weather forecasts. Don't wait until snow is falling to get started. It takes much more salt to melt accumulated snow than it does to prevent accumulation. Factor in expected traffic, approaching day/night change in temperatures, etc. Brine can be applied very early, forming a bond with the road that can be effective for days in the right conditions.

Proper Storage of Salt and Sand

Improper storage techniques can cause some of the most severe environmental damage from winter maintenance materials because they can result in highly concentrated runoff. Salt is the big offender, but because sand is mixed with salt to prevent it from freezing, sand piles should also be included in a proper storage program. Salt storage areas should be periodically inspected and well maintained.

A properly stored salt/sand pile is:

- Located away from source water protection areas, floodplains, and wetlands
- Sited on an impermeable (paved) pad, with a drain that directs runoff to proper treatment
- Covered with a roof and at least 3 sides

For More Information:

www.epa.gov/adminweb/naturalevents/snow-ice.html#highways

To find out about training in your state, contact your local Technology Transfer (T2) center:

CT: (860) 486-5400, www.t2center.uconn.edu/

MA: (413) 545-2604, www.ecs.umass.edu/baystate_roads/

ME: (207) 624- 3270, www.state.me.us/mdot/mlrc/mlrc-home.php

NH: (603) 862-2826, www.t2.unh.edu/

RI: (401) 874-9405, www.uritc.uri.edu/t2center/

VT: (802) 654-2652, personalweb.smcvt.edu/vermontlocalroads/welcome.htm

Less pollution
Safer roads
Lower Costs

Too much salt and sand can harm the environment and contaminate drinking water supplies. With some simple techniques and new equipment, however, crews can use less sand and salt while making roads significantly safer.

FACTS ABOUT SAND:

Recent studies have shown that sand loses its effectiveness as a traction enhancer on many roads after as few as 10 vehicles pass.

Sand clogs catch basins, builds up in streambeds, and impairs water quality.

When sand is ground between tires and the road, it forms dust that can affect people with asthma and other respiratory illnesses.