

## Safe Winter Travel for People, Goods and Services

In the Pacific Northwest, severe weather is a fact of life during winter. Transportation agencies face a difficult challenge to keep roadways open and safe during heavy snowfall, low visibility, and icy conditions. Snow and ice control methods allow these agencies to keep the road system safe, mobile and productive, striving to ensure that:

- Traveler safety is maximized by the reduction of vehicular accidents and associated fatalities and injuries
- Transport of goods (or merchandise) and services is less impeded by inclement weather, thus it can arrive to scheduled destinations throughout the winter
- Emergency service vehicles can continue to provide timely response and assistance
- Travelers can access winter recreational activities and support the local tourist economy
- Daily routines are uninterrupted

Snow and ice control methods have had a major, positive impact on traveler safety. In a case study in Iowa, it was found that during severe winter weather events, accidents increased by 1,300 percent and traffic volume decreased by 29 percent on a 30-mile roadway segment. In the State of Washington, it was found that the crash frequency rate was five times higher in the presence of snow than under clear roadway conditions.

## What methods are used for snow and ice control?

Transportation Agencies use a combination of traditional (e.g., snowplowing, sanding and de-icing) and improved (e.g., anti-icing and pre-wetting) methods to clear the roads and to provide traction during the winter.

### Mechanical Methods

- To quickly remove ice and snow build-up  
*e.g., snow plows and blowers*

### Abrasives

- To provide temporary traction in slippery conditions  
*e.g., sand (sometimes mixed with salt)*

### Chemicals

- Anti-icing or De-icing: to prevent or melt ice or snowpack
- Pre-wetting: to help abrasives and salts perform better  
*e.g., sodium chloride, calcium chloride and magnesium chloride*

## Do snow and ice control products have a significant impact on my health, my vehicle or the environment?

NO - PNS-approved chemical products pose no significant damage to human health, vehicles, or the environment, when used correctly. However, chemicals such as road salt are generally corrosive. The PNS has established stringent corrosion inhibited salt specifications to reduce their negative impact. PNS also recommends that vehicles should be washed on a regular basis to further minimize chemical corrosiveness.

Air quality, water quality along with endangered species can be harmed by the traditional use of abrasives, especially when used in large quantities or in sensitive locations:

- Abrasives increase the amount of particulate matter in the air, which can increase breathing difficulties for sensitive populations
- As snowpack melts, abrasives may run off into nearby fields and streams and affect plant and fish populations
- Abrasives may cause damage to vehicles, particularly to paint and windshields

- The use of abrasives requires at least seven times more material to treat a section of roadway than chemical products

New products are continually tested and introduced so that agencies can provide safer alternatives. For example, many transportation agencies have moved toward the use of more advanced chemical products in response to public and environmental concerns about abrasives and road salt. Compared to traditional methods of using abrasives and road salt, extensive research and testing has shown that these chemical products:

- Do not damage car windshields and paint like abrasives
- Do not have a negative impact on air quality
- Do not negatively impact water quality through run-off
- Are less corrosive to vehicles and infrastructure than salt, especially when blended with corrosion inhibitors

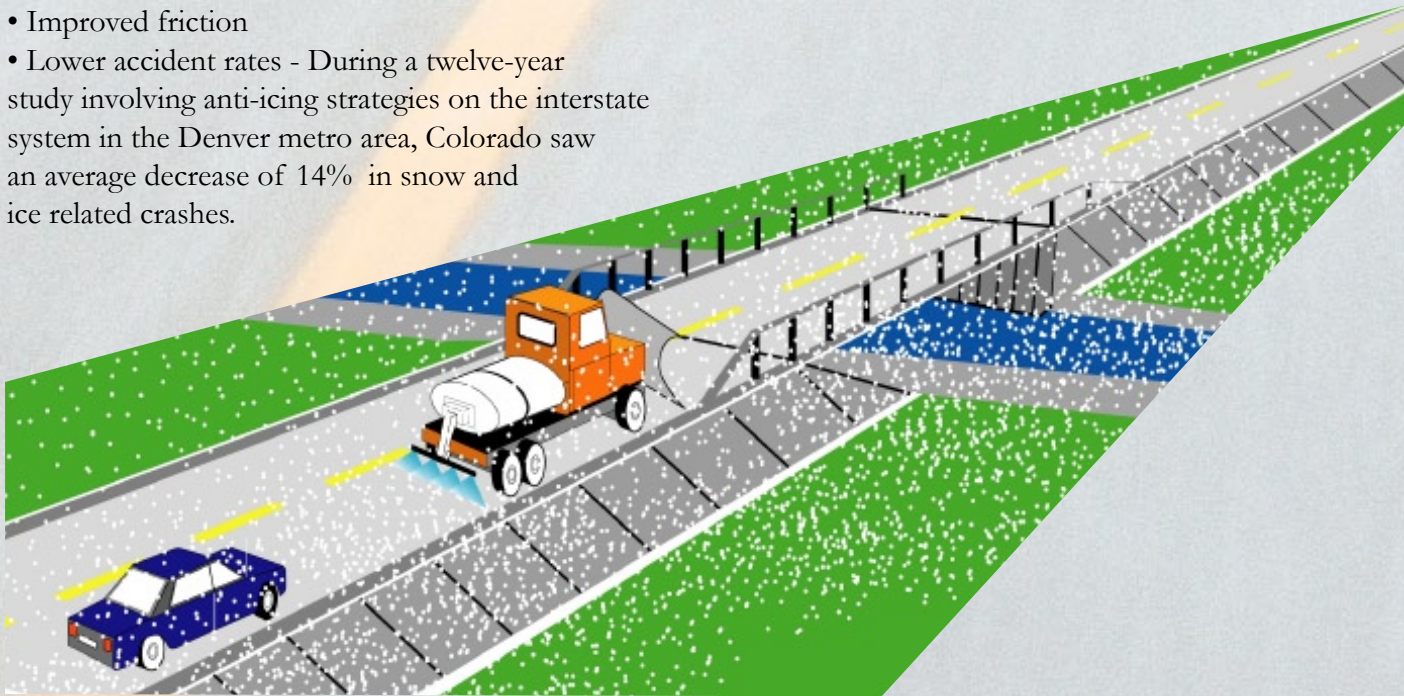


## Why Anti-icing and Pre-wetting?

- Anti-icing is the early application of chemicals to the roadway in advance of changing weather conditions. It helps prevent black ice formation, and to prevent or weaken the bond between ice and the road surface which allows for clear road conditions sooner. Anti-icing is a pro-active approach to winter driver safety. When used in conjunction with available weather information, anti-icing reduces the amount of chemicals and abrasives required.
- Pre-wetting is the addition of a liquid chemical to an abrasive or solid chemical before it is applied to the road. Pre-wetting has shown to increase their performance and longevity on the roadway surface, thereby reducing the amount of materials required.

## Benefits of Anti-icing and Pre-wetting Compared to Traditional Methods

- Decreased applications of chemical products
- Reduced use of abrasives
- Decreased maintenance costs
- Improved friction
- Lower accident rates - During a twelve-year study involving anti-icing strategies on the interstate system in the Denver metro area, Colorado saw an average decrease of 14% in snow and ice related crashes.



## The Pacific Northwest Snowfighters Association

### *Ensuring the safety of winter maintenance products*

The members of the Pacific Northwest Snowfighters Association (PNS) are the transportation agencies in the states of Washington, Oregon, Montana, Idaho, Colorado, and British Columbia.

The association's mission is to "strive to serve the traveling public by evaluating and establishing specifications for products used in winter maintenance that emphasize safety, environmental preservation, infrastructure protection, cost-effectiveness and performance."

PNS has developed specifications that can guide transportation agencies in the selection of chemical products for snow and ice control. Products that meet PNS specifications must:

- Pass a series of tests for chemical, frictional, toxicological, and corrosion;
- Meet environmental and health standards;
- Be at least 70% less corrosive than road salt.

PNS has become a recognized pioneer in establishing and standardizing chemical products for snow and ice control. Numerous states and provinces outside the Pacific Northwest have adopted the PNS specifications.

This brochure was produced by the Pacific Northwest Snowfighters Association, based on research conducted by the Western Transportation Institute at Montana State University. For contact information or more details on anti-icing and pre-wetting, please visit the PNS website at <http://www.wsdot.wa.gov/partners/pns/>.



**Pacific Northwest Snowfighters**  
Pacific Northwest Chemical Deicer Buyer and User Group

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**Clearing the way:**

Using improved  
methods and  
chemicals to  
keep roads safe

