


## Liquid Deicer Selection and Application

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Jason Bagley  
Dan Williams



### A Proactive Approach

Liquid anti-icing is *pro-active*



Salt/sand are generally *re-active*

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### The Value of Anti-icing

Snow and ice will never build up, if conditions allow, and you possess the right tools to use liquids.





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### Why Use Liquids?

**Liquids cost less**

- Liquids stay on the road better than solids
- Liquids keep salt/sand on the road plus bounce and scatter reduction
- Montana study: liquids reduce overall costs by 37%
- Oregon DOT: \$96/lane mile without liquids and \$24/lane mile with liquids (per storm)
- Colorado DOT: Seasonal costs of \$2.5k per mile, down from \$5.2k without liquids




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### Why Use Liquids?


**Improved Safety/Fewer Accidents**

- Snow/ice accumulation prevention
- Faster reaction time
- Achieves bare roads
- Fewer windshield damage claims



**Better for the environment and your equipment**


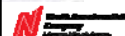
- Materials reduction
- Less corrosion with proper liquids



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### Liquid Use

- Anti-Icing
- De-icing/Direct Liquid Application (DLA)
- Combination techniques
  - Pre-wetting: liquid sprayed on salt at the spinner (5-10 gallon per ton)
  - Treated salt: liquid benefits without the liquid infrastructure (5-10 gpt)
  - Slurries: new technique with higher liquid pre-wetting use on salt (10-30 gpt)





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### How to Use Liquids?

Match the tool to the conditions

- Temperature of snow/ice events
  - Road temperature
  - Direction of temperature movement and time of day
- Amount of precipitation predicted
- Humidity
- Road conditions – Refreeze?
- Transition temperatures and tool changes mid-storm




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### How to Use Liquids?

Identify the level of service requirements

- Who's complaining? Are you meeting expectations?
- NCHRP handbook on deicer selection (2007)
  - [http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp\\_rpt\\_577.pdf](http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_577.pdf)
- Other reports on anti-icing and pre-wetting
  - Guide for Selecting Anti-Icing Chemicals (2001), Nixon/Williams
  - Anti-Icing and Pre-wetting for Winter Highway Maintenance Practices in North America (2005), O'Keefe/Shi


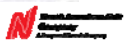


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### How to Use Liquids?

Other considerations

- Monitor weather forecasts
- Keep equipment calibrated and maintained
- Train employees on capabilities and expectations with liquid deicers
- Educate the public





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### How to Use Liquids?

Talk with experienced users

- "McHenry County has found that liquids improve level of service, reduce our overall cost and have a positive environmental impact."
  - Mark DeVries, McHenry County, IL
- "Liquid chemicals have proven to be a valuable asset with regards to increasing level of service sooner, optimizing solid material placement and retention and limiting negative impacts on air quality and sediment loading."
  - Justun Juelfs, Montana DOT Winter Maintenance Specialist





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### Scenarios

"You be the supervisor" group activity

Scenario #1:

- Road temp at 20° F
- Temperature falling
- Snow is imminent
- Road is currently clear
- Level 1 road.

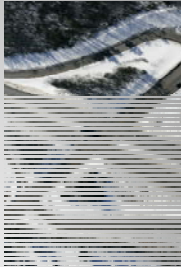

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### Scenarios

"You be the supervisor" group activity

Scenario #2:

- Road temp at 25° F
- Temp holding
- Storm is over
- Light snow pack on road
- Level 1 road





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## Scenarios

“You be the supervisor” group activity

Scenario #3:  
Road temp at  $-20^{\circ}\text{F}$   
Blowing snow  
Level 3 road



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## Takeaways

- Liquids are proactive
- Safer roads, less cost
- Positive impact on environment
- Not as tough as you think

Jason Bagley, North American Salt Company/Sifto Canada  
(913) 344-9390; [jbagley@compassminerals.com](mailto:jbagley@compassminerals.com)

Dan Williams, former Winter Maintenance Specialist at Montana DOT  
(406) 465-0761; [dwilliams@hughes.net](mailto:dwilliams@hughes.net)

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