

## RESULTS SUMMARY

Researchers developed a set of training tools—two videos and two quick reference guides—to promote liquid roadway treatments and provide practical guidance for agencies implementing a liquid anti-icing/deicing program.

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# LIQUID ROADWAY TREATMENTS: INFORMATIONAL AND TRAINING VIDEOS

Many agencies use liquids such as salt brine as anti-icing treatments to prevent ice from forming on roadways. But the application of salt brine as a deicing treatment during or after a winter storm has been slower to catch on. When used in the right conditions, liquid deicing treatments are as effective as granular sodium chloride while using less salt, but liquid-only routes are used by only a minority of winter maintenance agencies. To get the word out about the benefits of using salt brine and other liquids as both anti-icing and deicing treatments, as well as provide practical information about liquid application procedures, Clear Roads initiated this project.

## PROJECT DETAILS

**Project Title:** Training Video for the Implementation of Liquid-Only Plow Routes

**Project Number:** CR16-06

**Project Cost:** \$71,162

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## Need for Research

While there is a wide range of information available about the use of brine and other liquids for anti-icing and deicing, there was a need to offer clear, comprehensive guidance in a single resource and to provide training tools for implementation.

A 2010 Clear Roads [project](#) helped lay the groundwork for this effort by identifying the parameters for effective implementation of liquid-only plow routes. That project produced a quick reference guide that outlined the conditions when liquid deicing treatments are most effective and provided application rates and implementation recommendations. A follow-up study was needed to update this guidance and to develop tools to facilitate the implementation of liquid-only plow routes.

## Objectives and Methodology

This project's goal was to produce a set of training tools—two videos and two quick reference guides—explaining the benefits of liquid-only plow routes, outlining procedures for implementation, and addressing misinformation and misconceptions. The project had two objectives:



Researchers created two videos that clearly explain the benefits of liquid roadway treatments and provide practical guidance on implementing liquid-only programs.

- Inform agency decision-makers and the general public about the benefits of liquid roadway treatments while dispelling common myths.
- Provide practical guidance for maintenance managers and plow operators, and for agencies looking to start a liquid-only program.

Researchers began by conducting a literature review of research and practices related to liquid-only plow routes. They then sent an online survey to agencies in 27 states to determine which agencies used liquid-only roadway treatments. The survey yielded 92 responses from state DOTs and county and municipal highway departments. Follow-up interviews with 14 survey respondents gathered information about types of roads where liquid-only routes are used, application rates and material usage, brine making and storage, cycle times and loading times, and public perception and environmental concerns.

## Results

Of the 92 survey respondents, 30 indicated that their agency had a liquid-only route. In general, these respondents reported that liquids are more effective than solid deicers in the right circumstances.

Based on the information gathered in the survey, interviews and literature review, researchers created two videos:

- A [shorter video](#) for agency decision-makers and the general public that discusses the benefits of liquid-only treatments while addressing common misconceptions (particularly misinformation about corrosion and salts in the environment).
- A [full-length video](#) for practitioners that includes information from the short video as well as tips for starting a liquid-only program, discussion of equipment types, and recommended usage parameters and application rates.

To complement the videos, researchers created two 2-page quick reference guides—a [Start-Up Reference Guide](#) to help agencies gain buy-in for a liquid-only program and a [Technical Reference Guide](#) with more detailed usage parameters, application rates and general tips.

The videos and quick reference guides communicate key information about liquid-only routes, including:

- **Appropriate use:** Liquids are especially effective during light snowfalls and at milder temperatures. Agencies also use liquids to loosen packed snow for plowing; during high winds when granular salt may blow off the roadway; and as anti-icing treatments before freezing rain.
- **Benefits:** Liquid deicing treatments use less salt, which leads to cost savings and reduced environmental impact. Liquids begin to work immediately, and they stay on the roadway (no bounce or scatter).
- **Misconceptions:** Liquid applications of salt brine do not cause more corrosion damage to vehicles than granular salt. Granular salt must dissolve into brine on the roadway in order to melt snow and ice, so either approach exposes vehicles to salt brine. Corrosion inhibitors can help; some studies show they are more effective with liquids than solids.

## Benefits and Further Research

The videos give agencies modern communication tools to help target specific audiences: The shorter video is more appropriate for social media distribution and sharing, while the longer video is more useful for agency staff training and cross-agency communication. Both the quick reference guides and the videos will help agencies garner support for liquid-only programs and provide practical guidance for implementing them.

“To effectively get the word out about liquid-only road treatments, there was a need to put the right message in front of the right audience in a compelling way and to dispel myths and misconceptions. These guides and videos do just that.”

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