

Twenty ways to save on salt

New Clear Roads guide highlights best practices in procurement, storage and application

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The harsh winter season of 2013-14 had a significant impact on winter maintenance agencies throughout the country. The cold temperatures and frequent heavy snowfalls led to a shortage of road salt that hampered snowfighting efforts that season and increased demand and prices for the 2014-15 winter season.

While no one can control the weather, there are winter maintenance practices that can help to reduce salt costs. “When the FHWA (Federal Highway Administration) learned that state DOTs (departments of transportation) were running out of resources to fight snow, we began to work with states to find ways to help solve the problem,” said Gabriel Guevara, transportation specialist at the FHWA Office of Operations.

FHWA partnered with the Clear Roads winter maintenance pooled fund to create the *Manual of Best Management Practices for Road Salt in Winter Maintenance*. This manual, published earlier this year, collects best management practices (BMPs) related to buying, storing and applying salt that can help winter maintenance agencies meet their performance goals at the lowest possible cost.

A flexible guide

The guide reviews about 20 BMPs related to road salt, but it’s not a traditional, bulky manual that sits on a bookshelf collecting dust. “It’s really

a bunch of individual handbooks put together for convenience,” said Wilfrid Nixon, vice president of science and the environment at the Salt Institute and a co-author of the manual with Mark DeVries, lead consultant for Vaisala and chair of APWA’s Winter Maintenance Subcommittee.

Each practice is described on a single page, front and back. That format makes it easy to separate information about each practice and share it with the relevant personnel in easily digestible chunks—or laminate the sheet and put it in a common room for people to review on their breaks. “There’s a lot going on in winter maintenance, and it’s difficult to change practices when everyone’s so busy,” Nixon said. “We’re hoping the format of the manual will help to make change as easy as possible.”

The broad scope of the guide means that every winter maintenance agency should find information that addresses its specific challenges. “One state may need to address its procurement processes while another may need to look at storage,” said Clay Adams, bureau chief of maintenance at the Kansas Department of Transportation. Kansas, for example, didn’t face the same supply issues as many other states because there are three salt mines within the state’s borders and the DOT has storage for 150 percent of its average annual salt needs. “There’s always interest in reducing application

rates, though, so there’s something in the manual for everyone,” Adams said.

Best practices in review

In the procurement phase, agency practices can have an immediate impact on the price of salt. Offering vendors flexibility in delivery times, offering multi-year contracts, requesting bids early in the year and accepting salt deliveries before the winter season are all practices that can lower costs. Minimizing vendor risk by tightly specifying salt quantities (thus reducing the range between a minimum guaranteed amount of salt that the agency agrees to purchase and a maximum that the vendor promises to supply if needed but that the agency is not obligated to buy) will also typically reduce salt prices. Midwinter deliveries typically increase costs since demand is at its highest and weather conditions can hamper deliveries.

Naturally, these practices require adequate storage capacity to implement. Additional emergency stockpiles can also reduce costs by giving agencies the flexibility to buy salt when prices are low and rely on their existing supplies when prices rise. Facilities shared among multiple agencies can, in some circumstances, allow for larger facilities than the agencies could build independently, although partnership agreements need to be carefully defined (see photo #1).



Photo#1: This facility in Washburn County, Wisconsin, houses both state and county salt supplies, with a wall in the center of the building to keep the stockpiles distinct.

“We’re trying to increase our salt storage capacity, so this guide is going to inform that process and hopefully provide ideas of how to do so,” said Jeff Pifer, operations section leader at the West Virginia Division of Highways Maintenance Division.

The benefits of having adequate storage capacity can be undone if the salt isn’t stored properly, so the manual addresses BMPs for salt storage facilities. Best practices require salt to be covered and stored on an impermeable pad to avoid negative environmental impacts. A conveyor system that fills the storage facility from the top is the only way to utilize the facility’s maximum storage capacity and is safer than simply pushing salt into the building (see photo #2). Newer facility design options include multiple access points, stations for brine making, liquid storage and equipment for reusing wash water.

The third section of the manual collects BMPs related to road salt application. These practices have the potential to produce significant material savings: Prewetting salt can reduce consumption by 30 percent in some circumstances, and anti-icing

can reduce use by up to 75 percent (see photo #3). A flowchart in the manual helps users determine the situations in which anti-icing is likely to be effective.

The final section provides a brief overview of the procedures necessary to obtain federal reimbursement after storms that are severe enough to be declared disasters.

Spreading practices by spreading information

There’s nothing radical in the manual. “I think it’s fair to say that most of this information is already well-known,” Nixon noted, and the benefits of the BMPs have been demonstrated. But change in any organization can be a challenge, so these practices aren’t yet universal. Clear Roads and the researchers hope collecting the information in one place can help spread the practices by keeping information readily available and easily accessible.

“Different states operate in different environments and under different



Photo#2: Conveyor systems that fill a salt storage facility from its highest point maximize the facility’s capacity and are safer and more efficient than simply pushing salt into a stockpile.

constraints,” Pifer said. “This is a one-stop shop to learn what’s happening in other states and a place to start researching when you’re looking to make a change.”

The application guidelines in particular should be valuable to DOTs on an ongoing basis as well. “A lot of agencies, including my own, conduct winter training,” said Tim Peters, local policy and technology engineer at the Illinois Department of Transportation and manager of the Clear Roads project. “This manual should be useful in a training environment as DOTs prepare for winter.”

While Clear Roads comprises state DOTs, the guide is also applicable to local agencies. The DuPage River Salt Creek Workgroup (DRSCW), an organization of wastewater treatment agencies in northeastern Illinois administered by The Conservation Foundation, has shared the guide with its members through its website and will be discussing it in technical workshops. “What I really like about it is that you can point a public works department to the guide so they can start the learning process,” said Stephen McCracken, DRSCW project manager. While the information is available in bits and pieces elsewhere, “I don’t have another single resource that can do that.” That information can help encourage implementation and justify the investments in equipment that implementation sometimes requires.

The manual can be downloaded for free at <http://clearroads.org/project/roadway-salt-best-management-practices/>. A webinar about the manual is also available on the web page. For more details, contact Tim Peters at (217) 785-5048.



Photo#3: Anti-icing can reduce salt usage by up to 75 percent if conditions are right. The manual includes a flowchart to help determine whether anti-icing is likely to be effective.

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