Stop Throwing Your Deicer Budget in the Ditch
An Application Grid for Deicer That Can Save Agencies a Bundle

By Terance McNinch  © 2011

According to the Salt Institute, 16 million tons of salt was used as deicer on U.S. streets and highways in 2009. That deicer cost agencies $700 million. Yet if you follow a truck spreading deicer down a road you can see for yourself how much deicer doesn’t end up on the pavement. A study done in Denmark found that as much as 34 percent of pre-wetted deicer spread on the road is lost immediately due to bounce and scatter (deicer that isn’t wetted scatters even worse). Do the math—that’s 5.5 million tons lost in 2009 due to bounce, $250 million worth, in the ditch, or worse, in the storm drain, lakes and rivers. And if that isn’t bad enough, the same study found that in the first two hours of traffic, another 20-30 percent is thrown off. Conservatively, that’s another $140 million, wasted. Considering how public works budgets are stretched to the breaking point, this is a problem desperate for a solution.

Calibration Saves Money
According to Mark Cornwell, Sensible Salting Solutions, LLC., if you want to eliminate deicer waste you have to take control of two things—how much gets spread, and where it gets spread. “Proper calibration of every spreader in an agency’s fleet is the most cost effective thing an agency can do to reduce...
deicer waste and save money—big money,” says Cornwell. Controlling how much deicer is being discharged is done by calibrating the spreader in the garage. The process is different for every piece of equipment and different materials, so an agency can benefit from having some professional guidance. But once agency personnel are trained, calibration becomes something that gets done regularly before every winter season.

### Calibrating Where It Goes
As productive as quantity calibration is, Cornwell still saw it as only half of the solution. “Controlling where deicer is being spread really completes the picture,” notes Cornwell. “But real time evaluation, when a truck is rolling down the highway, just isn’t practical.” While in Europe visiting a spreader manufacturer he saw a large grid being used to measure spreader output. On the return flight he got to thinking about a grid that could test a variety of materials, application strategies and maybe even provide operator training. The Material Application Grid (MAG) mimics two or three lanes of highway along with a “penalty box” which collects the material that typically ends up on the shoulder and in gutters and ditches. An agency can use the grid to evaluate different pieces of equipment in their fleet, application rates for dry deicer and pre-wetted deicer, various levels of pre-wetting, liquid deicers, and operator behavior (travel speed, spinner speed, auger speed, gate openings, the blast button and more). The grid can be “painted down” in the equipment yard during training prior to last winter and ran spreaders through the calibration process. “It’s a real eye-opener,” says Bryan Pickworth, Road Maintenance Supervisor. “Being able to see the difference in application for various settings really clicked with the operators. It’s surprising that no one had thought of this before.”

Their old way of doing business was plow, salt, plow, salt, but not anymore. Using tight calibration, anti-sanding techniques and overall improved operations they have been able to overcome a reduction in workforce and still strive to provide a higher level of service. “You have to consider everything if you’re trying to improve your winter maintenance effort, but if your spreaders are not calibrated correctly, you’ve lost before you ever get started.”

The Town of South Windsor has graciously demonstrated proper sander calibration techniques during our Technology Transfer Expo and the Connecticut Public Works Academy. The South Windsor guide to sander calibration can be found on our website at: www.t2center.uconn.edu

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**Want to be a T2 Center Trainer?**

We at the Connecticut Technology Transfer Center are keeping an eye out for some new trainers. We are starting to build a list of potential trainers to contact when we are ready to hire new people. We hire trainers on a part-time contract basis, so it is perfect for retirees. Interested? We are looking for people who are effective at teaching skills or procedures who have experience training one or more of our main audiences: 1) road and bridge or public works officials, 2) supervisors/foremen or 3) front-line workers, 4) law enforcement officials with legal traffic authority responsibilities. Prior experience doing the job being taught is a big plus.

To add your name to the list, or to learn more about our specific needs for subject expertise, please contact Mary McCarthy at (860) 486-1584 or at mary@engr.uconn.edu.

We look forward to hearing from you.
On September 21st, the sun peeked out from a week’s worth of clouds to shine on the 10th Annual Technology Transfer Expo in Storrs. The event, sponsored and coordinated by CTI’s Technology Transfer Center (T2 Center), gathered more than 400 participants. Those in attendance shared in the demonstrations, educational sessions and networking that make this event so popular.

Each year, the T2 Center and CHSSA (Connecticut Highway Street Supervisors Association) uses this opportunity to provide educational outreach to state and local transportation professionals on the latest initiatives and regulations affecting the transportation community in Connecticut. This year, the focus was on the Federal Highway Administration’s Everyday Counts (EDC) Initiative and the Department of Energy and Environmental Protection’s Educational Outreach efforts. Exhibitors shared information on new technologies and processes such as Connecticut’s use of the Safety Edge, a new approach to hot-in-place recycling, innovations in guard rail design, environmental guidelines for fleet maintenance garages, and cost saving techniques in winter maintenance operations.

Safety is always a theme throughout the event as well. Several exhibitors shared information on the latest in both operational and roadway safety technology, and municipal transportation professionals participated in the Dr. Jack Stephens Memorial Safety Challenge. The towns of Colchester, Hebron and Bloomfield took top honors. Attendees also had the opportunity to test their snowplow skills at the driving simulator on loan from the Rhode Island DOT and LTAP Center.

A special thanks goes out to all the volunteers and exhibitors who helped make this day such a success. We look forward to another great show next year! To learn more about the Expo and the other programs of the Connecticut Technology Transfer Center, visit our website: www.t2center.uconn.edu.
The Safety Edge is a simple and effective solution to reduce the likelihood of run-off-the-road crashes. It can help save lives by allowing drivers who drift off highways to return to the road safely. When laying a new layer of asphalt, instead of creating a vertical drop-off at the edge, an attachment is added to the paving machine to shape the edge of the pavement to 30 degrees. Research has shown that this is the optimal angle to allow drivers to re-enter the roadway safely. The Safety Edge provides a strong, durable transition for all vehicles. Even at higher speeds, vehicles can return to the paved road smoothly and easily.

The Federal Highway Administration (FHWA), as part of its “Every Day Counts” initiative, has set a national goal to increase the use of the Safety Edge on state and local roads, working with States to develop specifications and adopt this pavement edge treatment as a standard practice on all new paving and resurfacing projects.

LTAP Centers across the country are helping meet that goal through a variety of ways, including workshops, paving demonstrations, safety edge “shoe” (attachment) loan programs, and education. This article is part of that effort. The Connecticut Technology Transfer Center has obtained a Safety Edge shoe for loan. This article will describe in more detail why the Safety Edge is considered a more effective technology than other methods for creating an angled edge, and how to start using the technology on your paving projects.

Why are pavement drop-offs so dangerous?
Roadway departures account for over 50 percent of all fatal crashes and severe-injury crashes in Connecticut (based on 2008 accident data). Further, a significant amount of roadway departures occur on local roads. Unforgiving pavement edges have been found to significantly contribute to roadway departure crashes. For example, researchers studying crashes in Missouri during 2002-2004 reported that pavement edges may have been a contributing factor in as many as 24 percent of rural run-off-road crashes on paved roads with unpaved shoulders. This type of crash was twice as likely to include a fatality as other types of rural crashes overall on similar roads. When a driver drifts off the roadway and tries to steer back onto the pavement, a vertical pavement edge can create a “tire scrubbing” condition that may result in over-steering. If a driver over-steers to return to the roadway without reducing speed, he or she is prone to lose control of the vehicle. The resulting crashes tend to be more severe or she is prone to lose control of the vehicle. These results were so positive that IDOT decided to use the Safety Edge on one of its own paving projects, and since then, IDOT has adopted the Safety Edge as standard practice statewide.

For more information on the Safety Edge Loan Program or the Every Day Counts Initiative, contact Donna Shea at the Connecticut T2 Center at (860) 486-0377. For more information on the T2 Center’s safety initiatives, please visit our website at: www.T2center.uconn.edu

Every Life Counts—Connecticut
Safety is one of the key focus areas for the Technology Transfer Center. As we work hard to develop local road safety initiatives, we will always keep in mind that “Every Life Counts.”

The T2 Center has a small supply of free car magnets with the new ELC – Connecticut Logo. Please send an email to Donna Shea at shea@engr.uconn.edu if you would like a few to put on your vehicles. For more information on the T2 Center’s safety initiatives, please visit our website at: www.T2center.uconn.edu

Safety Edge in Connecticut
By Donna Shea

Since the inception of the Safety Edge Loan Program here at the T2 Center, two local agencies have successfully installed safety edges, the Town of Farmington and the City of Waterbury. If you are interested in our safety edge loan program, please contact Scott Zinke and he will be happy to help you. Scott.Zinke@engr.uconn.edu

Common Questions
Why should I change my current process to include the Safety Edge?
The Safety Edge improves the short- and long-term safety of the roadway. Studies show that severe crashes may occur when a vehicle drops a tire over the edge of a nearly vertical pavement edge. The research shows that virtually all drivers can recover, even at high speeds. ETAP Center found the pavement edge is a 30-degree wedge. Using the Safety Edge also improves the durability of the pavement edge.

Do I need to modify my paving process to install the Safety Edge on asphalt? Very few changes are needed. The key item is to add a specially designed shoe, per manufacturer’s instructions, to the paver to create the Safety Edge. While paving, the shoe should be monitored and adjusted to keep the bottom edge of the device in contact with the road shoulder surface.

How much will the addition of the Safety Edge cost per mile? It will be almost negligible for Hot Mix Asphalt. It does depend somewhat on the specific design and construction parameters, but typically the process compacts asphalt that often otherwise would break off because it was loose. When measured, it has been calculated to be less than one percent additional asphaltic material.

How can I get started? If you are contracting-out a paving job, add the Safety Edge shoe to your specs. FHWA has posted a sample one-page Guide Specification at: http://safety.fhwa.dot.gov/roadway_dept/pavement/safetyedge/. If your agency uses its own equipment, borrow a Safety Edge shoe from the Connecticut T2 Center to give it a try, or visit the FHWA website above (click on “Frequently Asked Questions”) for information on the types of Safety Edge shoes currently on the market and where they can be purchased.

Case study: Iowa’s Safety Edge Policy
FHWA’s Iowa Division and the Iowa Department of Transportation (IDOT) recently began working with counties to install the Safety Edge on projects with a history of roadway departure crashes. The Safety Edge was included at the county level on project plans or incorporated as change orders on already-let projects. During one of these county projects, the contractor’s safety officer said the Safety Edge potentially reduced the contractor’s liability by provid- ing immediate elimination of the vertical drop-off.

After seeing how easily even large vehicles could traverse the pavement edge without loss of control or damaging the edge, the county decided its typical prac-tice of bringing in a gravel wedge before nightfall when a paving project was underway was not necessary when the Safety Edge was present. This saved the county time and money. The results were so positive that IDOT decided to use the Safety Edge on one of its own paving projects, and since then, IDOT has adopted the Safety Edge as standard practice statewide.

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