

# Hands-on with equipment calibration

**PROPER CALIBRATION** of salt and sand spreaders was the focus at hands-on workshops offered in October by the Wisconsin Transportation Information Center (TIC).



Workshop participants watch the weighing process during a hands-on session. *INSET: A full auger.*

*Participants from local road agencies learned firsthand the importance of controlling salt applications with an emphasis on reducing cost and environmental impact.*

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TIC held three educational sessions around the state where participants from local road agencies learned firsthand the importance of controlling salt applications with an emphasis on reducing cost and environmental impact.

Mark Cornwell of Sustainable Salting Solutions, Steve Wells and Nick Wiegmann of Monroe Truck Equipment, and TIC Staff Engineer Ben Jordan provided classroom instruction beforehand and worked with host agencies in the field demonstrations. Thanks to the City of Beloit, the City of Fond du Lac and Manitowoc County for providing locations, spreaders, materials and staff members for the hands-on part of the workshops, and to the Village of North Fond du Lac for providing a spreader at the Fond du Lac session.

## Real-world examples

The hands-on demonstrations featured calibration of manually controlled and ground-speed controlled spreaders. Workshop leaders demonstrated calibration using trucks from the fleets of city and county street and highway departments so the process

reflected the real world. Trucks ranged from being within recommended application rates on all auger settings and travel speeds, to exceeding recommended application rates at any auger settings and travel speeds.

Demonstrators also ran spreaders at different application speeds and spinner speeds over a grid painted on the pavement. This exercise demonstrated how slower speeds and lower spinner settings can reduce the bounce and scatter of salt and get more of it to hit the target. This target is the centerline, the top of the crown, on a normal crowned road.

Participants learned not to assume a new spreader arrives pre-calibrated. Local road agencies must check calibration with the salt materials they use in their operations. Calibrate spreaders and controls at least annually before the start of the snow season, the workshop group was advised, and any time the spreader undergoes a modification or major repair.

## Make adjustments

The calibration demonstrations offered an opportunity for mechanics and operators to review details about making adjustments to winter equipment. For example, if a spreader controller on a manual

control spreader exceeds recommended application rates, the mechanic may need to adjust the hydraulic control valves in the controller to a lower flow rate. Agencies also can consult with the truck supplier or spreader controller manufacturer about other valves with lower flow rates they can substitute for the existing valves.

For ground-speed controllers, each manufacturer provides calibration instructions that match the specific sequence of keypad or touchscreen entries the equipment requires to initiate and complete the calibration steps.

The workshop group heard that all ground speed controller calibration procedures begin with determining the "trim settings" that establish minimum and maximum auger speeds. The next step is running a test where the controller drops a set amount of material and then enters the actual weight of the material collected back into the controller. The controller uses this weight to adjust the calibration. The verification test that follows checks the application rate with the controller simulating a specific road speed. Operators verify calibration by comparing the weight of the discharged material to the expected weight of the simulated speed.

## Other steps

Workshop topics also covered some basic but necessary steps to ensure accurate calibration. These include making sure the truck is warmed to normal operating temperature, has an adequate amount of material loaded and a full auger. Finally, it is important to zero out the scale with the collection container in place or record the tare weight of the container.

## Moving forward

Calibrating salt and sand spreaders is an effective way for local governments to reduce operational costs while minimizing environmental



*Participants learned that a tarp and bucket TOP are effective stand-ins for a hopper and electronic scales BOTTOM in calibrating salt and sand spreaders.*

*Continues on next page*

# RESOURCES

impacts of their winter operations. Agencies that currently do not calibrate their spreaders can start with inexpensive calibration equipment. Hardware, home improvement and outdoor stores carry the basics: a muck bucket, five-gallon buckets, a bathroom scale or game scale, and a stopwatch.

Publications and videos from TIC that outline the steps involved in spreader calibration are a useful resource for every street and highway department as they work to implement or improve their calibration programs. ■

## Resources

<http://www.clearroads.org/research-projects/05-02calibration.html>

Link to Clear Roads report on Calibrating Accuracy of Manual and Ground-Speed-Control Spreaders that includes practical guidelines for plow operators.

[www.dot.state.mn.us/maintenance/research/files/MnDOT\\_Salt\\_and\\_Sander\\_Calibration\\_Guide.pdf](http://www.dot.state.mn.us/maintenance/research/files/MnDOT_Salt_and_Sander_Calibration_Guide.pdf)

Minnesota Department of Transportation Calibration Guide features easy-to-use steps for calibrating winter equipment developed by experienced calibrators.

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## Publications

**Identification and Laboratory Assessment of Best Practices to Protect DOT Equipment from the Corrosive Effect of Chemical Deicers**, March 2013, Washington State DOT. Extensive report includes information on corrosion-reduction effectiveness of vehicle washing, and use of corrosion inhibitors and salt removers. Report is available for download at:

[www.wsdot.wa.gov/research/reports/fullreports/796.1.pdf](http://www.wsdot.wa.gov/research/reports/fullreports/796.1.pdf)

**Minnesota's Best Practices for Pedestrian/Bicycle Safety**, Minnesota Department of Transportation. Resource for local agencies wanting to improve safety for pedestrians and bicyclists on their road systems. Discusses both proven and experimental practices. Provides information on cost and effectiveness. Available for download at:

[www.dot.state.mn.us/research/TS/2013/201322.pdf](http://www.dot.state.mn.us/research/TS/2013/201322.pdf)

## DVD/Video/Multi-media

**Sand and Salt Spreader Calibration**, 13-minute DVD from Baystate Roads Program in Massachusetts discusses calibration procedures for salt and sand spreaders. Available from the TIC Video Library.



## Web Sources

An updated page on the Wisconsin Department of Natural Resources site provides information on permitting for transportation projects and Transportation Liaison County contacts. Also explains WisDOT and WDNR cooperative agreement, a flood disaster facts sheet and other useful links.

<http://dnr.wi.gov/topic/Sectors/Transportation.html>

Section 11-45 of the **Facilities Development Manual** includes WisDOT Policy and Design Guidance related to Safety Edge and link to Standard Detail Drawing 14B29.

<http://roadwaystandards.dot.wi.gov/standards/fdml/11-45.pdf>

FHWA resource on Safety Edge technology with quick facts and case studies.

[www.fhwa.dot.gov/everydaycounts/technology/safetyedgeintro.cfm](http://www.fhwa.dot.gov/everydaycounts/technology/safetyedgeintro.cfm)

Links to **Constructability Review** reports for 2012 and 2011 WisDOT Safety Edge projects from the Construction and Materials Support Center at the UW-Madison.

<http://cmssc.engr.wisc.edu/2012-safety-edge-evaluation.pdf>

<http://cmssc.engr.wisc.edu/2011-safety-edge-final-report-3-12-12.pdf>

WisDOT page with link to Approved List that includes approved equipment for Safety Edge construction.

[www.dot.wisconsin.gov/business/engrserv/lap2013.htm](http://www.dot.wisconsin.gov/business/engrserv/lap2013.htm)

Print copies of listed publications available free from TIC. Download or request items at **Publications on TIC website**. Video, CDs, and DVDs loaned free at county UW-Extension offices. Also see **Video Catalog on TIC website**.

**TIC website**  
<http://tic.engr.wisc.edu>



# FEEDBACK

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