TECHNOLOGY NEWS
Iowa's Local Technical Assistance Program (LTAP): providing transportation technology transfer for Iowa's cities and counties

Ground speed applicators ease winter maintenance

Editor's note: This article, "Snowplowing tips from a couple of old hands," and "Removing snow traps with one person and one machine," both on page 3, are based on presentations given at the Iowa Maintenance Training Expo in September.

USING GROUND speed applicators on your snowplow spreaders makes the job of maintaining winter roads a little easier, says Brian Keltner, mechanic at the Iowa Department of Transportation, Anamosa. These small black boxes electronically control the amount of granular or liquid material being applied to the roadway based on the truck's speed. The units also record the amount of each material type used daily and even keep a year-to-date total.

Features of ground speed applicators

While ground speed applicators or controllers have been in use since the mid-1980s, recent improvements have made them smaller, allowing them to fit more easily into the cabs of snowplows, and more reliable.

In addition, the newer models have digital readouts that give snowplow operators such information as air temperature, pavement temperature, and the output of granular or liquid material at any given time. For granular materials, the controller gives a readout of pounds per mile or pounds per lane mile. For liquid deicing chemicals used as pre-wetting solution, the controller gives a readout of gallons per ton or, when the chemicals are used for anti-icing, gallons per lane mile .

Another attractive feature of ground speed controllers is that they "give operators the ability to change to any of three different types of material on the fly," according to Keltner. In other words, the operator can go from applying salt to sand to pre-wetting or anti-icing chemicals, changing the material to suit the need.

Benefits of using ground speed applicators

Keltner says that one of the main advantages of

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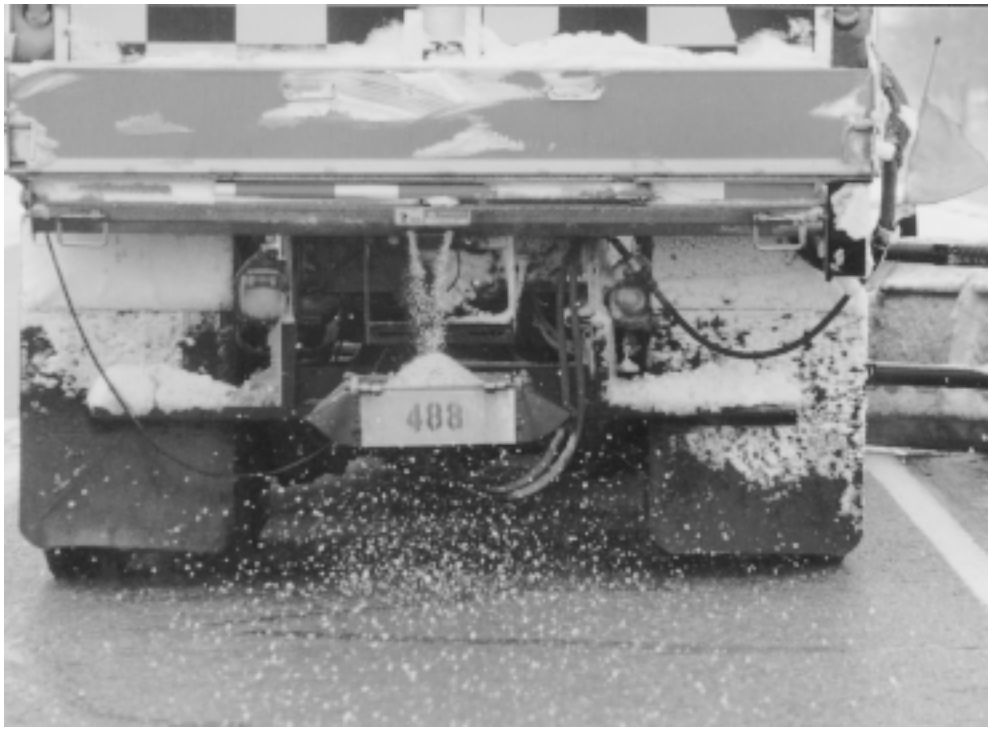

Ground speed applicators control the amount of salt spread by plows.
Photo courtesy of the Iowa Department of Transportation.

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using this sophisticated equipment is uniform application. Once the machine is calibrated to dispense, for example, 200 pounds of sand or salt per lane mile, it will maintain that application rate regardless of the truck's speed. Without such equipment, the output of material is heavier wherever a truck slows down; the auger dispenses material at the same rate even though the truck is covering less distance.

Keeping track of material types and amounts used is also important to street and highway departments, according to Keltner. He says, "Sand is losing popularity as a winter road treatment because of environmental issues, so the amount of sand being used is a concern. If we apply sand to a bridge in the winter, we have to sweep it up in the spring. Most likely, that sand has become contaminated with motor oil, antifreeze, and battery acid dripping from cars. That means we can't just dump the sweepings anywhere, and disposal fees are high."

The overuse of salt can create problems, too. "At 28 to 30 dollars per ton, salt is relatively cheap," says Keltner, "but the costs can add up if we apply more than is actually needed." Keltner says that salt appears to be less of an environmental problem than sand because it eventually washes into a river or stream where it becomes diluted. In spite of the dilution, however, the concentration levels need to be monitored to prevent harmful effects to plants and wildlife.

Another benefit of ground speed applicators is that they can modify the rate of application of sand or salt to provide optimal motorist safety based on pavement and air temperatures. As Keltner points out, using too little sand or salt doesn't help motorists at all and using too much increases costs and possible environmental hazards while providing no additional benefit.

In addition to reducing material waste and keeping track of materials used, ground speed controllers can cut down on overtime expenses. The controller takes the guesswork out of the application process, so the need for reapplication of chemicals is often eliminated. "Operators more effectively put chemicals where they are needed," says Keltner. "For example, pretreating roads before a snowstorm cuts down on the time required to maintain the roads during the storm."

Before you buy

Initial cost for a ground speed controller can range, roughly, between 1,000 and 3,000 dollars. While the units can provide many benefits, Keltner says that initial cost is just one of the factors to consider before purchasing one.

For example, he says that training maintenance staff is important, particularly on the wiring and sensors that are part of the controller system. Calibration of the controllers goes hand-in-hand with wiring and sensor maintenance, so it is usually done by the mechanics. Keltner says the focus should be on the mechanics, who then become trainers for the operators. He says that one hour of training each season is usually adequate for the operators.

Departments must also evaluate the hydraulic systems of their trucks before purchasing ground speed controllers because they're not suitable for all trucks. "The hydraulic system is what runs the controller," says Keltner. "Or you can view the hydraulic system as the heart and the controller as the brain. If there are problems in the hydraulic system, such as bad motors, sticky valves, or electrical issues, they could be magnified by the use of a controller. The hydraulic system needs to be matched to the controller."

For more information about ground speed applicators, contact Brian Keltner, 319-462-3676. •

WWW links

http://www.usroads.com/journals/subjects.htm

Check "snow and ice control" for several articles such as "Good Ideas from Winter Maintenance Workshops" and "Using Salt and Sand for Winter Road Maintenance."

http://www.fhwa.dot.gov/infrastructure/asstmgmt/

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