

Last year we told you about the Iowa Department of Transportation's advanced technology snow plow truck. It's been through one winter now; here's how it performed on the job.

High tech snow plow: An update



IN 1996 the state departments of transportation in Iowa, Michigan, and Minnesota talked with the people who operate and maintain snow plow trucks to learn what would make their work easier and more effective. The DOTs took those suggestions and designed, assembled, and tested an advanced-technology winter maintenance vehicle for each of the three participating states.

The winter of 1997-98 was the first test phase for the vehicles. The Iowa Department of Transportation's (Iowa DOT) prototype snow plow truck maintained I-35 from the I-35/I-80/I-235 interchange north to the Highway 210 interchange.

In addition to plowing and applying chemicals and abrasives, the vehicle automatically collected data for researchers through the air/pavement temperature sensor on the driver's side mirror and a friction meter behind the underbody blade. The global positioning systems (GPS) equipment recorded the truck's location every five seconds. All of this data was stored in the on-board PlowMaster computer, which, in later phases, will automatically adjust the application of materials for current road and weather conditions.

How did the advanced technology perform?

The concept vehicle combined several technologies that weren't necessarily designed for the harsh

environment of winter maintenance activities, and some of the technologies did not always work perfectly. The friction meter, because of its location near the road surface, accumulated salt and grit, and the temperature sensors were sometimes wrong. Malfunctioning equipment didn't prevent the operators from getting their work done, however. Drivers reported that they were still able to operate the truck at or above the same level of service with which they operated conventional snow plows.

The variable speed material applicators, which are used on some of the Iowa DOT's other maintenance trucks, worked well, drivers said. They were able to set the prescribed amount at a given speed, and the applicator compensates for speed changes. One suggestion was to move the material applicator controls so they can be used while the truck is in motion.

The PlowMaster computer was user friendly and easy to read, drivers said. The screen could be dimmed or brightened and information could be called up quickly.

Drivers reported that after they became familiar with the technology, they were able to use it with relative ease. The additional technology allowed them to focus more of their attention on the road, and it made drivers more efficient than with standard plows.

What will be done differently in the future?

Some changes and modifications are planned for the vehicle's technology for the winter of 1998-99. The vehicle will be fitted with differential GPS because of its greater location accuracy, usually within five feet, compared to conventional GPS, which can be off by as much as 100 feet. A collision avoidance system

may be added as well as additional sensors to collect even more weather data. Drivers may temporarily use cellular phones to transmit PlowMaster data to the base station. Eventually the cell phones will be replaced with radio communications.

Researchers at CTRE are identifying methods to quantify the benefits of the new technology, particularly materials costs, labor costs/savings, and safety.

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