

Tech tools turn states' winter road challenges from icebergs to ice cubes

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During a snowstorm, two snowplows clear snow from a road in Frizzellburg, Maryland, March 5, 2015. Photo: AP/Carolyn Kaster

WASHINGTON, D.C. — Many states are using technology in new ways to help clear roads and make them safer during snow and ice storms.

From Pennsylvania to Nevada, states will battle the elements by using high-tech tools. Road sensors, tracking gear on snowplows and onboard cameras that upload photos of current conditions are some examples.

“Technology has changed winter services across the board,” said Rich Roman, maintenance and operations director for the Pennsylvania Department of Transportation. “Look inside a plow truck — it almost looks like the cockpit of an airplane.”

Rick Nelson coordinates the American Association of State Highway and Transportation Officials (AASHTO) winter maintenance program. He said states devote time and money to research and technology. They are doing this more and more to ensure that people can get where they need to go during winter storms.

Season's Storms Prove Costly

“So many people think there isn’t anything you can do about the winter — it snows and you just accept it,” Nelson said. “But as a country, we are so dependent on our mobility. There’s a lot of pressure on states to maintain mobility 24/7, 365 days a year, regardless of what the weather throws their way.”

State transportation departments are usually responsible for maintaining highways, state roads and bridges. In many states, that means paying millions of dollars for trucks, salt and staff time.

An AASHTO survey of 23 states found they spent about \$1.13 billion between October 2014 and April 2015 treating and plowing roads. For many, that represented a large portion of their annual maintenance budget. New Hampshire spent 55 percent, for example.

One of the worst-hit states last winter was Massachusetts. It was struck by 31 storms, two of which brought among the heaviest snowfalls on record. The state ended up spending more than \$153 million to treat and plow roads.

Pavement Gives Feedback

Nelson said the National Weather Service and meteorologists do a good job forecasting the weather. Still, a winter storm can be very different once it hits the ground. That’s why states are turning to snow-fighting technology.

Many have installed their own weather stations. They use sensors in the pavement to notify them about the road’s temperature, whether it’s wet or dry, even whether it has been treated with de-icer. That helps them determine when to apply more, or fewer, chemicals.

Nelson said states are more proactive than they used to be. In the past, they would say, “It started snowing, I plowed and put my salt on the road.”

Some states use tracking gear on plow trucks to send headquarters instant information about each vehicle’s location. A few also use the gear to track weather, road conditions, and the amount of salt being used. This alerts transportation supervisors to changing conditions. It helps them get a better handle on the use of materials, trucks and overtime.

Cutting Down On Salt

Roman said the 728 or so trucks that cover the state’s interstates and expressways will be mounted with sophisticated tracking gear this winter. “We’re hopeful this will make our truck routes more efficient and help us manage our materials a lot better.” One way would be using less salt than usual if the temperature rose, Roman said.

Saving on salt means states can spend more on routine maintenance the rest of the year.

Some state transportation officials also are using technology to study their performance during particular storms. They learn how quickly they cleared roads and how soon motorists were able to drive at normal speeds. They're also trying to determine whether crashes were reduced.

About 1,500 people a year are killed in crashes involving snow, sleet or ice, said Paul Pisano. He runs the Federal Highway Administration's research and development office.

Iowa Posts Photos On Internet

"I absolutely believe that these technologies are helping states better manage the roads," Pisano said. The technology will mean a safer driving environment, he said.

Iowa has been out front in using snow-fighting technology and in sharing information with the public.

Craig Bargfrede runs Iowa Department of Transportation's winter operations. He said about half the state's 900 snowplows are equipped with iPhones. They take photos of the road every five to 10 minutes. The photos are posted on a website so supervisors can see the actual conditions. This lets supervisors see road conditions from their homes and offices instead of getting out on the road, saving money and time, he said.

In Minnesota, about two-thirds of the state's 850 plow trucks are equipped to gather information about atmospheric conditions. Up-to-the-minute weather information and air and road surface temperatures are also monitored. The technology takes the data and comes up with suggestions for which chemicals to spread, how much to apply, and how frequently to plow.

State officials aren't just worried about tackling bad weather. They're also concerned about the impact of using salt and anti-icing chemicals, which can be hazardous in some environmentally sensitive areas. In years' past, a plow truck operator would simply turn on the spreader and distribute salt over and over. The new plan is to use just the amount needed to do the job and no more. Officials say technology is helping to make that happen.

Quiz

- 1 Which of the following statements is implied in the section "Pavement Gives Feedback"?
- (A) that technology saves time and money
 - (B) that people are not effective without technology
 - (C) that technology reduces the number of snowplows needed
 - (D) that technology helps control dangerous weather conditions
- 2 Based on the section "Iowa Posts Photos On Internet," with which of the following statements would Pisano most likely AGREE?
- (A) Technology is marginally effective in helping to keep roads safer in the winter.
 - (B) Safer winter roads are not connected to the use of technological advancements.
 - (C) Using technological advancements to address road conditions in winter weather is worth the investment.
 - (D) Saving money is the number one consideration when it comes to using technology to address winter road conditions.
- 3 Read the sentence from the introduction [paragraphs 1-4].

From Pennsylvania to Nevada, states will battle the elements by using high-tech tools.

What is the meaning of "elements" in the sentence?

- (A) essentials of an idea
- (B) familiar domains
- (C) environmental conditions
- (D) parts of something larger

4 Read the selection from the section "Pavement Gives Feedback."

Nelson said states are more proactive than they used to be. In the past, they would say, "It started snowing, I plowed and put my salt on the road."

What is the definition of the word "proactive" in the sentence?

- (A) causing a problem
- (B) predicting a change
- (C) reacting to an event
- (D) preparing ahead of time