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# UTA researchers target road expense, deterioration

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A University of Texas at Arlington civil engineering professor is addressing Texas' \$6.3 billion annual tab for roads and its interest in being more environmentally friendly.

Stefan Romanoschi and his research team have devised a pavement testing machine that accelerates the deterioration of road materials, and with a \$1.12 million grant from the Texas Department of Transportation, they will test the durability of pavement mixes that include recycled materials.

Ash from coal power plants, slag from blast furnaces, asphalt shingles from old roofs or production plant scraps, and chunks of road surfaces will be ground and incorporated into parallel strips of pavement at a new testing center in Fort Worth.

By increasing pressure and frequency of tire rotations, the machine Romanoschi helped build can document a decade's worth of pavement deterioration in three or four weeks.

The 30-ton electrically powered testing machine is the first of its kind in Texas. With its large steel frame, it looks like the body of a semitruck.

A motor pulls the central carriage back and forth every six seconds at a speed of around 8 mph. The frame exerts 5,000 or more pounds of pressure on the two-wheel axle to simulate pavement stress and measure durability. There are also controls for temperature.

Two graduate students assist with the research. A full-time technician will oversee the machine's maintenance.

"What seems like an academic enterprise has huge implications for the state," said Romanoschi, who has been studying pavement for over 15 years and has a photo of cracked concrete hanging outside his office.

Because bitumen, a heavy byproduct in the oil refining process, is a major pavement component, the price of asphalt tracks the price of crude oil, said Darren Hazlett, deputy director of TxDOT's construction division.

"So when the price of crude oil goes up a whole lot, like it is currently and has for the past four, five, six years, the price of asphalt goes up," Hazlett said. "In Arlington they're trying to look to see how we can extend and save resources."

Even a 1 percent reduction in costs will make a huge difference.

"The sooner we get better results, the sooner the state can start saving," Romanoschi said.

Accelerated pavement testing gives states much more confidence in road building, said Bouzid Choubane, the pavement engineer for the Florida Department of Transportation.

"You can get meaningful results — on construction practices, on materials, on design — in a much shorter time," said Choubane, former chairman of the Transportation Research Board's Full Scale and Accelerated Pavement Testing Committee.

In October, once the road pad is prepared for the UTA research team's recycled pavement experiment, the machine will be hitched up to a trailer and moved to the testing center. The machine can be moved to test pavement anywhere in the state.

The Advanced Pavement Research Center is owned and operated by the university. It hopes for future clients that might include tire companies and asphalt producers.



