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# Metro & State

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## Computer model helps predict auto crashes

Accidents not so random, data show

By James Nash  
THE COLUMBUS DISPATCH

To some drivers, predicting a traffic accident might seem as confounding as forecasting where lightning will strike or in whose back yard a meteor will fall.

After all, no computer can know when a driver might be distracted by a cell-phone call, where a drunk will get behind the wheel or what stretch of roadway will be covered in black ice.

But State Highway Patrol officials and Ohio State University statisticians think

wrecks are less random and more predictable than they seem. Patrol brass and the university's statistics department have teamed up to develop a computer model that predicts when and where crashes are likely to occur.

The system, which booted up for the July Fourth holiday weekend, puts Ohio at the leading edge of attempts to reduce the movements, and blunders, of thousands of drivers to an exact science.

Or maybe an inexact science.

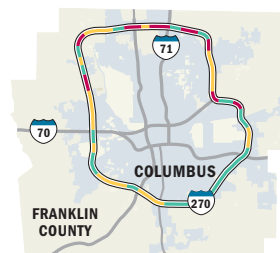
"We're forecasting based on very broad sorts of things," said Christopher Holloman, associate director of OSU's

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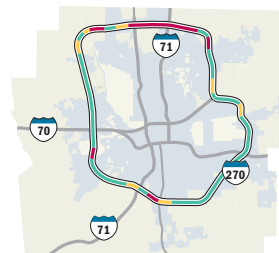
### Study identifies trouble spots

The State Highway Patrol and Ohio State University worked for several months to produce a statistical model for predicting vehicle crashes on I-270. Using this model, the Highway Patrol can place its cruisers on the Outerbelt at spots that probably will have more accidents. Here's the model for June 30 of this year:

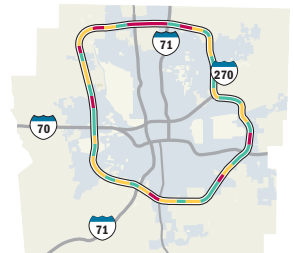
PERCENTAGE OF FATAL AND INJURY ACCIDENT SCENES — TOP 20 — MIDDLE 40 — BOTTOM 40



Alcohol-related crashes



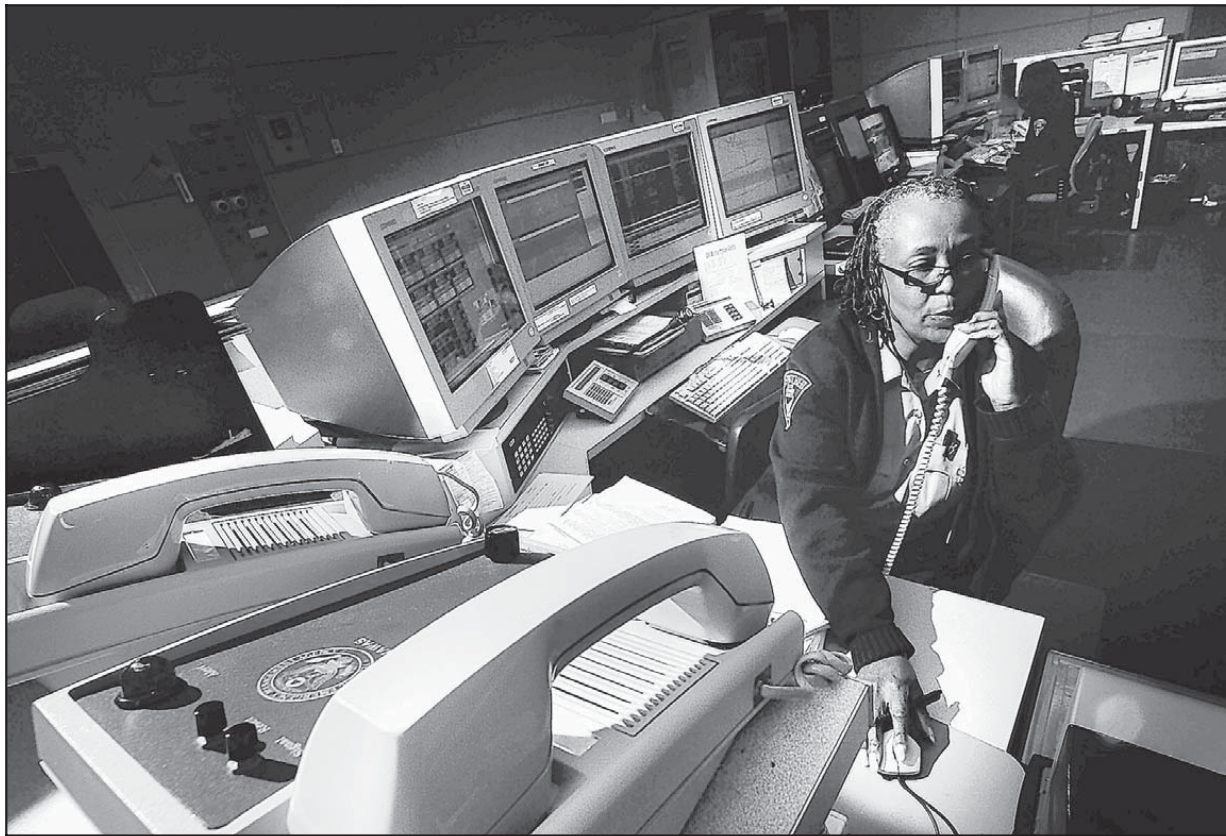
Speed-related crashes



Commercial vehicle crashes

Sources: Ohio State University Department of Statistics; State Highway Patrol

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Dispatcher Kathy Starling, of the State Highway Patrol, operates out of the district's headquarters on West Dublin-Granville Road.

## CRASHES

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Statistical Consulting Service and the lead architect of the system. "If it were possible to constantly monitor every mile of roadway, we could do (more precise) forecasting."

To build the model, Holloman and his colleagues entered data for the 1.9 million car crashes that caused injury or death in Ohio metropolitan areas between 2001 and 2005. They were categorized by cause, time of day, location and whether a truck was involved.

The Highway Patrol paid Ohio State \$19,000 to develop the system.

The model also can account for inclement weather, but the system isn't advanced enough to plug in real-time factors, such as debris in the roadway or an area where cars are unexpectedly slowing down.

Nor does it factor in road construction, which Holloman said was shown not to be a major cause of accidents.

The system still is in its infancy. In central Ohio, it covers the full loop of I-270, but no other freeways or roads. It also has been developed for some highways in Toledo, Dayton, Cleveland and Cincinnati.

Highway Patrol commanders are using the computer program to decide where to deploy troopers and what to tell them to look out for, said Lt. Col. William Costas, the patrol's assistant superintendent for operations.

For example, if the model showed a high likelihood of speed-related crashes on the southwestern curve of I-270 between 7 and



Lt. Rick Zwayer, of the State Highway Patrol, says more data would improve the accuracy of accident forecasts.

9 a.m., the patrol could station more troopers with radar guns at that time.

"We're at a point now where this model can actually forecast the likelihood of future serious injury and fatal crashes and narrow it down to workable areas where we can assign our people and identify the types of violations that are causing these crashes," Costas said.

The program isn't sophisticated enough, however, to give drivers bulletins when hazardous conditions pop up in an area. That might come later, Holloman and patrol officials said.

Costas and Lt. Rick Zwayer said the patrol hopes to incorporate more data, such as driving speeds, to make its predictions more accurate.

"It's definitely a step along the way of what the Highway Patrol hopes to have," Holloman said.

The setup still places Ohio a step ahead of virtually every other state in predicting collisions, said Richard F. Pain, transportation safety coordinator for the Transportation Research Board of the National Academy of Sciences.

Only Colorado has a comparable system, Pain said.

States have long collected information on where crashes occur in order to eliminate safety hazards built into highway design, and to put officers in problem areas.

Ohio's system of using that history, along with multiple other factors to predict accidents, is a new science, however.

"This is very advanced statistical methodology," said Pain, who has not studied the Ohio model. "It's leading-edge research."

Accident forecasting is likely to spread to other law-enforcement agencies in an age where officers have more responsibilities, such as homeland security, Pain said.

"I believe it has the potential in the long run to improve where we spend the money so we get the greatest bang for the buck in terms of minimizing crash risk," he said. "Will it be tremendously dramatic in the next year or two? No. We're looking at a 10-year timeline for these things to really start making a big difference."

Early indications are promising, Costas said. Holloman and patrol officials used the system to predict accident patterns during the July 4 holiday weekend. Most of the collisions happened roughly when and where they were expected, Costas said, adding that more crash data will be needed to make any final judgments.

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