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NEXT IN TECH Updated June 12, 2012, 2:11 p.m. ET

Tapping 'Big Data' to Fill Potholes

Start-Ups Help States and Municipalities Track Effects of Car Speeds, Other Variables on Traffic

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By SHIRA OVIDE

Entrepreneurs and investors are finding new ways to tap the predictive power of numbers, including ways to kill the traffic jam and other motorist scourges such as potholes.



Start-ups are helping states and cities track effects of car speeds, potholes and other variables on traffic jams. Shira Ovide reports on digits. Photo: Getty Images.

The results are playing out inside a state traffic-management center in Woodbridge, N.J. That's where New Jersey officials watch a 22-foot-high mounted screen as supercomputers powered by start-up Inrix Inc. scoop up millions of cellphone and GPS signals, make sense of the jumble of information about car speeds, weather conditions and sports schedules, and translate the data into maps of traffic along 2,600 miles of the state's roads.

Anatomy of a Traffic Jam: How start-up Inrix is using data to help reduce traffic jams. Includes a diagram showing data flow from cars to a central processing unit.

Until recently, the transportation department would have been in the dark. Like many states and municipalities, New Jersey used to rely on accident information from a mishmash of traffic cameras and \$20,000 roadside sensors that covered 5% of the state road network at best. Under those conditions, the I-80 accident could have lingered for hours. Instead, the trouble spot was cleared in 30 minutes.

"Data like this is helping us move forward and make decisions we couldn't make before," said Dhanesh Motiani, executive director of transportation systems management at the state transportation department. New Jersey said it pays about \$540,000 a year for the Inrix system.

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The New Jersey center offers a glimpse at the power of "big data," a term for techniques to gather reams of computerized information points, analyze them and spit out patterns, often in easy-to-understand visuals like maps or charts. While some industries have used big-data

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methods for years, what's new is the massive scale of data being generated now thanks to the proliferation of networked gadgets like mobile phones and the growing power of computers to store and make sense of data quickly and more cheaply.

"Everything is a big-data problem right now," says David Hornik, a general partner at venture-capital firm August Capital, which invested in Inrix. "And the biggest change is that every device, every vehicle, everybody is manufacturing huge amounts of information."

Start-ups including Waze Inc. and Uber Technologies Inc. and such tech giants as [Google Inc.](#) [GOOG +0.24%](#) and [Apple Inc.](#) [AAPL +0.32%](#) are also applying big data to transportation issues. On Monday, Apple announced its new maps app will include live traffic updates. For many cities and cash-strapped agencies, officials say, the proliferation of data technologies can help them cut costs and make smarter choices about transportation projects, direct people to empty parking spots and otherwise ease annoyances for citizens.

In Boston, for instance, the city is planning to launch Street Bump, a mobile-phone app that can identify potholes as people drive on city roads. The app detects minute changes in a phone's accelerometer—the same technology used to shift the orientation of a smartphone screen when it's tilted sideways.

Chris Osgood, co-chair of city hall's Office of New Urban Mechanics, says Boston also hopes to use Street Bump technology to figure out which roadways are most in need of repaving. Today, municipalities often make such decisions based on cumbersome surveys that involve engineers in pickup trucks dragging chains behind them and measuring the vibrations of the metal.

Surveying the entire Boston roadway system each year using traditional techniques would cost roughly \$200,000, Mr. Osgood says, while the city's tab for developing Speed Bump was roughly \$80,000. "This system will give us a living, breathing map of how the road system in the city is working," he says.

Noam Bardin, chief executive of Waze Inc. of Palo Alto, Calif., which makes a navigation application for mobile phones, says the company has gotten lots of interest from government agencies that want to better analyze and use such traffic data. The company says its free mobile app is adding 1.5 million users a month to its existing base of 18.5 million people.

Waze, which has 75 employees, up from 40 a year ago, doesn't have any revenue. It says it is focused on drawing users while the company decides how to make money.

Tech experts say that as software improves and companies gain access to a bigger data archive, new ways of harnessing big data will emerge. Inrix is among the companies starting to tap historical traffic patterns—along with other variables including sports-team schedules—to help beach-going drivers plot whether they'll hit fewer bottlenecks by leaving Friday evening or Saturday morning.

There are limits to using big data. Swimming in numbers doesn't necessarily mean that the right information is being collected or that people will make smarter decisions. Last year, a McKinsey Global Institute report cautioned there is a shortage of specialists who can make sense of all the information being generated. Stalled spending on roads and transit also means more data may not translate into easier commutes.

Companies may also trigger consumer-privacy fears as more gadgets transmit data about daily interactions. But for now, big-data firms believe people are willing to provide information to solve shared problems.

"The nice thing about traffic is there's a common enemy," says Waze's Mr. Bardin. "Everyone hates it."

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A version of this article appeared June 12, 2012, on page B6 in the U.S. edition of The Wall Street Journal, with the headline: 'Big Data' to Fill Potholes.

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