

Study: Cell-phone bans while driving have more impact in dense, urban areas

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Sheldon H. Jacobson, right, a professor of computer science at Illinois, says legislation banning cell phone use while has more of an impact in densely populated urban areas that have a higher number of licensed drivers. Matthew J. Robbins, left, was one of two students who conducted the study with Jacobson. Credit: L. Brian Stauffer

A new study analyzing the impact of hand-held cell phone legislation on driving safety concludes that usage-ban laws had more of an impact in densely populated urban areas with a higher number of licensed drivers than in rural areas where there are fewer licensed drivers, according to a University of Illinois researcher.

The study, conducted by Sheldon H. Jacobson, a professor of computer science and the director of the simulation and optimization laboratory at Illinois, analyzed the relationship between pre- and post-law [automobile accident](#) rates using public data from 62 counties in New York.

Jacobson and co-researchers Alexander G. Nikolaev and Matthew J. Robbins published their results in an article titled "Evaluating the Impact of Legislation Prohibiting Hand-Held [Cell Phone](#) Use While Driving," which will appear in a forthcoming issue of the journal *Transportation Research Part A: Policy and Practice*.

The team found that after banning hand-held cell phone use while driving, 46 counties in New York experienced lower fatal accident rates, 10 of which did so at a statistically significant level, while all 62 counties experienced lower personal injury accident rates.

They also discovered that the personal injury accident rate decrease was more substantive in counties such as Bronx, New York and Queens, where there was a high density of licensed drivers rather than in sparsely populated areas of upstate New York.

"What that suggests is, if you have a congestion of cars and you're distracted, you're more likely to hit someone," Jacobson said. "If you have a lower congestion of cars, you're still distracted, but you're less likely to hit anyone because there are less people to hit. It's simple probability."

Driver distraction is thought to be the cause of nearly 80 percent of automobile accidents in the U.S., resulting in about 2,600 deaths, 330,000 injuries and 1.5 million instances of property damage annually.

Although a ban on hand-held cell phone use while driving in [rural areas](#) has less of an impact on driver safety, Jacobson says that doesn't necessarily mean the ban itself is worthless.

"Hand-held cell phone bans are very valuable in high-density urban areas, but less so in lower-density rural areas," Jacobson said. "But that doesn't mean they have no impact in rural areas. It just means that such

legislation is less likely to have an impact on driver accident rates."

Jacobson's study differs from other studies in that, rather than focusing on reaction times of simulated drivers in lab setting, it analyzed publicly available data of accident rates published by the New York State Department of Motor Vehicles.

To allow for a proper comparison between time periods, the years 1997 to 2001 were treated as the pre-law time period, and the years 2002 to 2007 were considered as the post-law time period.

"Nobody's done a study like this before," he said. "Everything prior to this is a micro-analysis of reaction time in laboratories by researchers."

The challenge, Jacobson said, was getting the right data to analyze.

"The best state that had the data to analyze was New York," he said. "They've had the hand-held cell phone ban in place since 2001. So we had a lot of data, relatively speaking, in that we had a before-and-after snapshot of accident rates."

Jacobson said one of the limitations of the study is extrapolating the data from New York state and projecting it onto the nation at large.

"That's fraught with problems, but these are limitations we acknowledge," he said. "Every state is unique, but the overall conclusions still stand to reason."

Jacobson, who also holds appointments as a professor of industrial and enterprise systems engineering, of civil and environmental engineering, and of pediatrics at Illinois, says the holy grail of data sets to analyze would be the property damage data collected by insurance companies.

Jacobson says the difference between his study and one recently published by the Highway Loss Data Institute, an affiliate of the Insurance Institute for Highway Safety, is that he used publicly available data and the number of licensed drivers as a proxy for accident prediction.

(The insurance industry-backed report studied pre- and post-ban insurance claims from accidents in California, Connecticut, New York and Washington, D.C. It contends that state laws banning the use of cell phones while driving didn't reduce the number of vehicle crashes.)

If the property damage data were available to Jacobson and his co-researchers, "We could come up with a more definitive statement," he said.

"But even with this, we still saw some very compelling trends that would support the legislative push at the state and federal level for distracted-driver legislation. It's certainly a topical problem."

Another challenge for Jacobson and his team was how to standardize accident data across the counties. Their solution was to use the number of licensed drivers and compare the statistical inferences to licensed-driver density.

"Measuring the throughput of cars is very difficult," Jacobson said. "As a result, using the number of licensed drivers is a reasonable way to standardize, and licensed-driver density provided an interesting measure to compare the counties."

The measures of traffic safety considered in the study are the number of fatal automobile accidents per 100,000 licensed drivers per year and the number of personal injury accidents per 1,000 licensed drivers per year, Jacobson said.

For the purpose of analysis, the personal injury accident rate proved to be a more appropriate measure.

"The trend that we saw was that high-density driving areas tended to have a more precipitous drop in the number of fatalities and accidents after the ban was implemented than in lower-density areas," Jacobson said. "This was more pronounced for personal-injury rates than it was for fatality rates."

Jacobson acknowledges that other factors also could influence accident rates.

"There could be education programs that are bringing these numbers down, or a particular area had a series of bad winter storms or multi-year road construction projects, which would inflate the numbers," he said.

Despite the exponential growth in cell phone subscribers, Jacobson says that all the evidence suggests that hand-held cell-phone bans while driving are worthwhile.

"All the evidence suggests hand-held cell phone bans while driving are a good thing, and this is more evidence to that effect," he said. "But it doesn't establish it definitively. There's still more work to be done, but this helps to further clarify the picture."

Provided by University of Illinois at Urbana-Champaign

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