

## If you think seatbelt use inconvenient, consider the inconvenience of being injured

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Since most driving is done locally, it should not be surprising that most auto accidents occur during local errands. Yet, occasional seatbelt users are more likely to buckle up for trips on high speed roads, according to an analysis of data from 100 instrumented vehicles reported in the January 2013 issue of *Accident Analysis and Prevention*.

If drivers and front-seat passengers used seatbelts all the time, deaths from crashes would be reduced by 45 percent, according to the [National Highway Traffic Safety Administration](#) (NHTSA). Yet 15 percent of drivers and front-seat passengers do not belt up.

"We wanted to find out what makes occasional seatbelt users buckle up more than half the time," said Jon Hankey, senior associate director for research and development at the Virginia Tech Transportation Institute. "They know it is a good idea, so why don't they do it all of the time?"

NHTSA provided funding for the project through the AAA Foundation for Traffic Safety. Virginia Tech Transportation Institute researchers looked at hours of video and [GPS data](#) from the naturalistic driving research project.

Naturalistic driving research is a relatively new data source. The [100-car study](#), also funded by NHTSA, was the first of its kind, instrumenting vehicles in the Northern Virginia and Washington, D.C., metro area with sensing and recording equipment. There were 108 primary and 299 secondary drivers. More than 150,000 driving trips were recorded over one year.

In addition to questions about education, age, [traffic crash](#) history, and whether they use a seatbelt, participants filled out questionnaires designed to determine [personality type](#) and to measure thrill seeking and aggression, for instance. "We wondered if these traits would be predictive of seatbelt use," said Ian J. Reagan, a NHTSA research psychologist at the time of the study, now a senior research scientist with the Insurance Institute for Highway Safety.

"The first objective was to determine if there were variables, such as trip distance, speed, and time of day, that uniquely characterized consistent, occasional, and infrequent seatbelt users," said Hankey.

"The second objective was to conduct a more detailed analysis of the group defined as occasional seatbelt users to identify factors associated with these drivers' decisions to wear their belts on some trips but not others," he said.

In the 100-car data set, seatbelts were observed being worn in 79.1 percent of the primary driver trips and 81.2 percent of secondary driver trips. The project defined infrequent users as those wearing a seatbelt in 30 percent or fewer of their trips, occasional users as wearing a seatbelt in 40–85 percent of their trips, and consistent users as wearing a seatbelt in more than 95 percent of their trips.

The data sample for most of the between-group analyses included 13 infrequent seatbelt users (18,017 trips), 16 occasional users (20,846 trips), and 56 consistent users (63,858 trips). Within these groupings of primary drivers, infrequent users wore a seatbelt in an average of 10 percent of their trips, occasional users wore a seatbelt in 65 percent of their trips, and consistent users wore a seatbelt in 98 percent of their trips.

The researchers discovered that, for an average trip speed of 30 mph, such as when driving around town, 72.7 percent of occasional belt users would be belted, whereas the estimate of belt use at an average trip speed of 50 mph was 89 percent. "We figured that drivers choosing to wear their seatbelt may be considering road type rather than speed limit," said Julie A. McClafferty, data reduction group leader with the Virginia Tech Transportation Institute. "We confirmed this using data from the GPS sensor to identify the road type on which each trip took place, which did reveal that occasional belt users were belted in more than 80 percent of trips involving travel on interstates but only about half of trips limited to secondary roads."

"A driver that rarely buckles up may only be able to be made compliant

by legal deterrents such as primary safety belt laws," said Sharon P. Berlin, a NHTSA fellow at the time of the study, now a traffic safety research analyst at AAA. "On the other hand, occasional users may have an unrealistic view of a certain trip's risk, and an education program targeting this unrealistic view may have a significant impact on seatbelt compliance."

Other findings from the study were:

- Young women were more likely to be infrequent belt users than women over 40.
- Individuals with higher educational attainment are more frequently consistent belt users.
- Occasional belt users scored higher on aggressive driving than consistent users. "This result would be expected in that consistent seatbelt use should be indicative of safe driving, and safe drivers should theoretically drive less aggressively," said Reagan.
- Drivers in the infrequent-user group had an at-fault crash/near crash rate approximately double that of the other two groups. "The analysis was not statistically significant, but the finding has important safety implications; converting these at-risk drivers to consistent belt users would reduce injury severity," said McClafferty.
- Consistent belt users took significantly fewer trips per day than infrequent and occasional belt users, suggesting "there may be a 'convenience factor' associated with belt use. Infrequent and occasional belt users may perceive unbuckling and buckling repeatedly throughout the day to be bothersome," said Hankey.
- "Self-reported seatbelt use was comparable to usage rates we observed on the video," said McClafferty.

The researchers warned in their article that a limitation of the project is

the small sample size of drivers, particularly among the subsamples of drivers defined as occasional and infrequent belt users. "The naturalistic study may have detracted from enrolling risk-seeking drivers into the study," they wrote.

A new U.S. study, the Strategic Highway Research Program, will be the largest naturalistic study ever, with 2,000 cars. "It will provide much greater statistical power to follow-up on the results from this exploratory analysis," said Hankey. "Even so, our findings from the 100-car study may help focus messaging efforts to convert occasional and inconsistent seatbelt users to consistent users."

"The observed variability in seatbelt use as a function of number of trips per day, average speed, and road type suggests that the decision to wear a seatbelt may result in part from perceived convenience as well as an inaccurate progression in risk perception associated with driving environment," said Reagan. "Thus, a practical implication for safety efforts associated with these findings includes targeting education and enforcement campaigns that might address such misperceptions."

The *Accident Analysis and Prevention* article, "[Using naturalistic driving data to identify variables associated with infrequent, occasional, and consistent seatbelt use](#)," was written by Reagan, who is corresponding author; McClafferty; Berlin; and Hankey.

Provided by Virginia Tech

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