Differential Safety Belt Use by Time of Day

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Safety belt use in the United States has risen steadily over recent years. The national safety belt usage rate in 2003 was 79 percent, a 4-percentage-point increase over the 75 percent usage rate in 2002. In 2004, the national safety belt usage rate rose to 80 percent. Analyses of data from the Fatality Analysis Reporting System (FARS), however, has shown that among fatally injured front-seat outboard occupants of passenger vehicles, the safety belt usage rate was between 42 and 46 percent for the years 1999 to 2003.

One possibility for this discrepancy is that reported safety belt usage rates are in fact *daytime* belt usage rates. Observations of belt usage occur exclusively during daylight hours and therefore exclude safety belt use at night. It has long been suspected that nighttime belt use is lower than daytime belt use. If that were the case, a higher fatal crash rate at night would exacerbate the impact of the lower rate of safety belt usage at night.

FARS Analysis of Connecticut's Crash Data

The figure below illustrates the results of an analysis of FARS 2000 crash data for front-seat passengers in Connecticut that shows daytime and nighttime belt use in fatal crashes. Belt use among fatally injured front-seat occupants of passenger vehicles declines steadily, from its 10 a.m. daytime peak until 2 a.m. when it reaches 27 percent—the lowest point.

Percent Belted Fatally Injured by Hour of Day In Connecticut, 2000 (Source: FARS)

In 2004, in order to document the difference in daytime and nighttime safety belt use, the National Highway Traffic Safety Administration conducted observations of nighttime safety belt use in Connecticut. Preusser Research Group (PRG) conducted this survey concurrent with Connecticut's annual, full, statewide daytime belt use survey.

The day observations versus night observations were nearly identical with respect to observation procedures and location. They differed primarily with respect to time of day. PRG conducted day and night observations twice, once pre- and once post- Connecticut's May 2004 *Click It or Ticket* (CIOT) mobilization.

Observed Day and Night Belt Use

The sample sites used in the night (9 p.m. – 3:59 a.m.) belt observations were the same sites approved for use in Connecticut's Safety Incentive Grant for Use of Seat Belts (23 U.S.C. 157) full, statewide belt use survey. For both day and night surveys there were 100 sites in seven of Connecticut's eight counties. These counties contain 97 percent of the State's population. The daytime procedures followed the section 157 Uniform Criteria for State Observational Surveys of Seat Belt Use (23 C.F.R. 1340). PRG developed the nighttime procedures to mimic the guideline set forth for daytime observations.

Prior to Connecticut's May 2004 *Click It or Ticket* mobilization campaign, the researchers conducted "mini" statewide observations of 17 sites, all of which were also part of the full statewide survey. The researchers designed this mini-survey to provide a "snapshot" of Connecticut belt use. Immediately following the mobilization, PRG conducted a second round of observations using all 100 sites included in Connecticut's statewide safety belt survey.

Special Night Vision Equipment

The observers used sophisticated night vision equipment to conduct the nighttime observations. This allowed for vision in both light and dark areas. To supplement this equipment, handheld infrared spotlights, visible only with the use of the night vision goggles and not to the human eye, further illuminated the scene to make vehicle occupants visible for belt observations even in total darkness. Two-person teams conducted the observations, with one person observing traffic and the other recording the results as stated by the observer.

Percent Observed Belted Pre- and Post- *Click It or Ticket* Campaign by Time of Day

The results of the day and nighttime surveys showed that the daytime safety belt usage rate was 83 percent compared to a nighttime usage rate of 76.6 percent. The safety belt usage rate was 6.4 percentage points lower at night than during the day.

The greatest difference in belt use by time of day was for SUV occupants, where belt use was almost 9 percentage points lower at night. Pickup truck occupant belt use, while lowest of the vehicle types, showed the smallest difference between day and night belt use.

Urban and Rural Areas

The difference between daytime and nighttime observed belt usage rates in Connecticut is much greater in urban areas. It is likely that the population of drivers is different during the day. Drivers in cities during the day may live in the outlying suburbs and commute to and from the city. Connecticut suburbs are generally more affluent than Connecticut cities. By nighttime, these drivers have returned to the less urban roads. Regardless, belt use on Connecticut urban roadways at night is substantially lower than during the day. An analysis of FARS data showed a similar pattern among fatally injured front-seat occupants, with no difference between day and night safety belt use on rural roads. On urban roads, there was a 15-percentage-point difference in use rates during the day and night (55% versus 40%).

***Click It or Ticket* Mobilization Affected Areas**

The researchers compared belt use both pre- and post-CIOT campaign. The pre-campaign data came from the 17 “mini” sites. The post-campaign data contained the full 100 sites that included the 17 mini-sites.

There was a smaller—yet still significant—difference between day and night belt use following the mobilization than before. Thus, the *Click It or Ticket* daytime enforcement and media campaign appeared to have an impact on nighttime safety belt use, as it has also been shown to do during daylight hours.

Percent Observed Belt Use by Time of Day

Vehicle Type	Night	Day
Car	74.5% (N = 6,516)	82.1% (N=17,315)
Pickup	56.6% (N = 512)	62.3% (N = 2,521)
SUV	76% (N = 1,431)	84.8% (N = 5,293)
Van	72.4% (N = 615)	79.5% (N = 3,133)
Total	73.6% (N=9,074)	80.5% (N=28,262)

Additionally, it appears that “daytime” enforcement of safety belt use as shown in the national *Click It or Ticket* campaign ads may influence nighttime belt use. The researchers noted, however, that most, if not all, of the television commercials used by Connecticut depicted police officers ***at night*** (in an urban environment) issuing tickets for safety belt violations. It is unclear whether the change in belt use at night was caused by this advertising, the daytime enforcement alone, or a combination of both.

It would appear that law enforcement should give consideration to the importance of efforts to increase belt use at night, especially in urban areas, given the much higher per mile crash rate that occurs at night.

How To Order

For a copy of **Connecticut's Day and Night Safety Belt Use** (17 pages) write to the Office of Research and Technology, NHTSA, NTI-130, 400 Seventh Street SW., Washington, DC 20590; or send a fax to 202-366-7096; or download the document from **www.nhtsa.dot.gov**. Linda Cosgrove, Ph.D., was the contract manager.

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