



2015 LOUISIANA NIGHTTIME ADULT SEAT BELT OBSERVATION SURVEY RESULTS

-FINAL REPORT-

LHSC Project No. 2015-15-11

STATE OF LOUISIANA
Bobby Jindal, Governor



LOUISIANA HIGHWAY SAFETY COMMISSION
John A. LeBlanc, Executive Director

September 2015

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INTRODUCTION

Approximately one-quarter (26%) of traffic related fatalities across the United States occur between the hours of 10 P.M. and 4 A.M. This window of time represents 25% of the 24 hour day but only 10% of daily traffic occurs during this time. A contributing factor to increased fatalities at night is lower seat belt usage at nighttime. NHTSA’s Fatality Analysis Reporting System (FARS) indicates unbelted fatalities are much more likely to occur at night. That is true in Louisiana where the seat belt use rate among Louisiana fatalities is 39% on average, but from the hours of 6 P.M. through 5 A.M., belt usage is much lower than average (Figure 1).¹

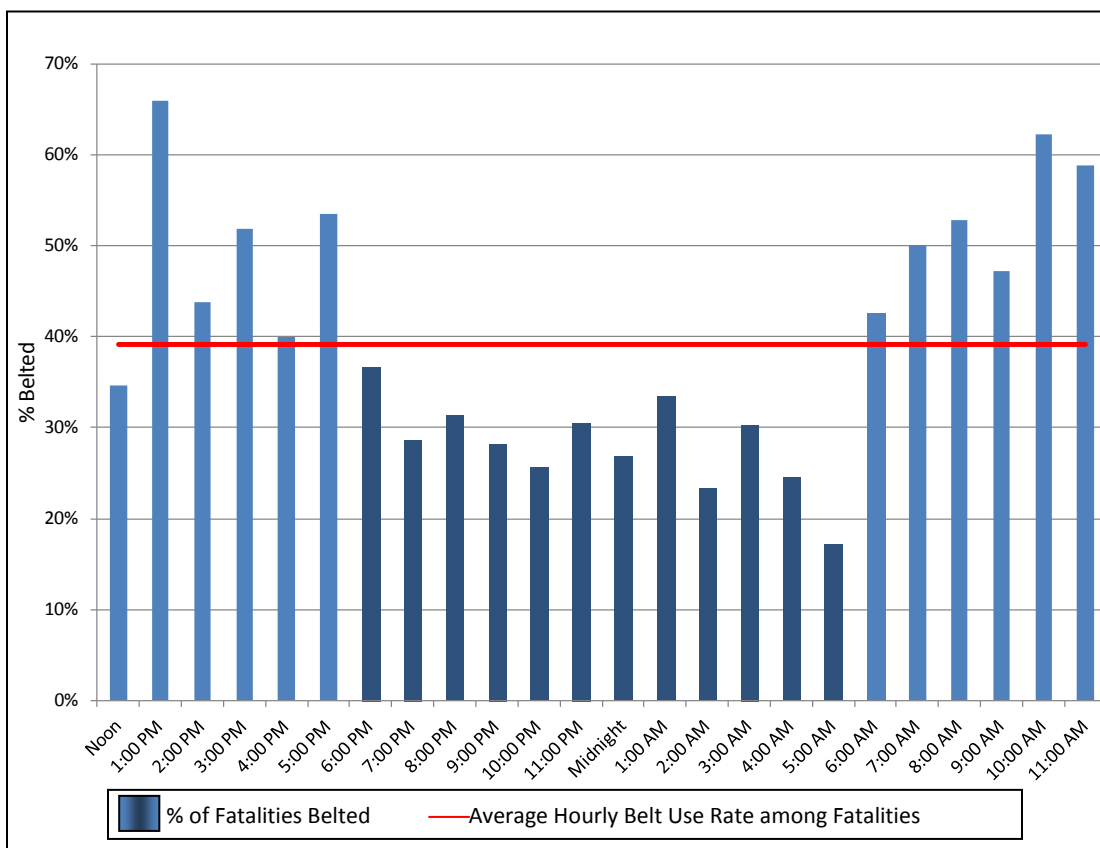


Figure 1: Percent of Louisiana Fatalities Wearing a Seat Belt by Hour;
Passenger Vehicle Deaths 2009-2011

Preusser Research Group (PRG), under contract with the State of Louisiana, developed and conducted a nighttime seat belt survey in November 2012. This was the first nighttime survey of seat belt use in Louisiana. The survey involved the collection of seat belt use information at a subsample of the sites used in the annual statewide daytime seat belt survey, also conducted by PRG for the State. The nighttime sample was stratified to provide representation for eight geographic regions in the State. Ultimately, a 10% sample of the sites visited for the daytime survey was used for nighttime observation

¹ 39% represents an average of recent, annual restrained fatality rates for Louisiana. The most recently reported restrained fatality rate for Louisiana, for 2013, is 41% (Source: IIHS).

and analyses. PRG replicated this nighttime seat belt survey for the State in November 2013, and again May/June of 2015. The results of the 2015 survey are presented in this document.

METHODOLOGY

Nighttime Survey Site Selection

Forty nighttime observation sites were randomly selected from the list of observation sites used in Louisiana's annual daytime statewide survey. The nighttime sites were selected from a subset of the daytime survey sites that included only Interstate roadways and State Roads. Smaller local roads were not eligible for the sample because they would likely result in too few vehicles at night for the analyses. Specifically, eight Parishes, one from each region of the State, were randomly selected (Figure 2). Eligible Parishes had to have at least five Interstate and State Road sites, at which there were at least 30 vehicles recorded during the daytime observations. The goal of this step was to help ensure that there would be at least five vehicles per site at night to observe.

The Parishes selected for night observations were: Caddo, Calcasieu, East Baton Rouge, Lafayette, Jefferson, Ouachita, Rapides, and St. Charles.

Five sites were randomly selected per Parish, for a total of 40 sites overall. In general, PRG selected two Interstate ramp sites and three State/US routes. When there were more than two Interstates or more than three State/US routes eligible for inclusion, these sites were randomly selected (Appendix A).

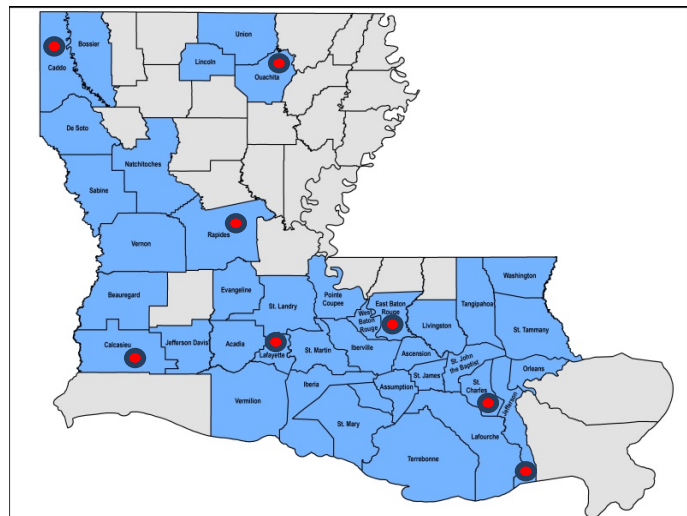


Figure 2: Parishes included In the Nighttime Survey

Nighttime Survey Scheduling

PRG assigned a single survey team to each Parish. The survey team completed observations in the Parish in a single night. Two Parishes (25% of the total sites) were selected for Friday night measurements, in order to have both weeknight and weekend nights fairly represented. The other Parishes were assigned a Tuesday, Wednesday, or Thursday night. PRG scheduled the nighttime observations to take place between the hours of 8:00 P.M. and 3:00 A.M. Each observation period lasted one hour.

Observers were given an observation schedule and a pre-mapped route for travelling from site-to-site in each Parish. Site order was determined by following the previous year's schedule. PRG also provided the survey teams a reference diagram for each observation site (these diagrams were used in previous

surveys). Site diagrams provided information on exactly where the surveyor team should stand, the direction of traffic flow to observe, and prominent landmarks (names of intersecting roadways, traffic lights, nearby buildings, etc.). The survey teams used this information as a guide to make every attempt to approximate the previous year's collection methods.

A number of alternate sites were selected and mapped in the event any site was compromised due to construction or re-routing of traffic.²

Nighttime Survey Observers

PRG used two trained observers and two data recorders. Both observers had previous experience conducting seat belt observations, including work on substantial parts of the Louisiana daytime survey. Additionally, all four surveyors had extensive experience observing at night, and utilizing night vision technology when necessary.

Night vision goggles were used in tandem with infrared spotlights to provide adequate illumination of the vehicle occupants without adversely affecting them. PRG survey teams are trained to use this technology only when sufficient ambient lighting is not available to see inside the vehicles.

Survey teams wore high-visibility reflective vests and positioned themselves safely away from the normal flow of traffic. Each observer also carried a letter of identification authorized by the Louisiana Highway Safety Commission, which indicated the purpose of the survey and the data collection schedule.

Data Collection Procedures

Passenger vehicles with a gross vehicle weight up to 10,000 pounds were included in the survey. Drivers, right front seat passengers (excluding children in child safety seats), rear seat occupants, as well as motorcycle operators and passengers, were observed for seat belt use or helmet use. Observers recorded vehicle type (Car, Truck, SUV, Van, Motorcycle), and gender and race (white, black, Hispanic, other) of drivers and passengers on the data collection form. A copy of the data collection form can be found in Appendix B.



Night Vision Goggles



Infrared Spot Light

² Observers went to 40 sites and completed 40 hours of observations. After all of the observations were completed, one site was dropped for consistency with the 2012 and 2013 collections for a total of 39 sites included in the survey.

Observers recorded pertinent site information on the data collection form, including site number and exact roadway location, date, day of week, time, weather condition, and direction of traffic flow. Each one-page form included space to record information on 25 vehicles, the driver of that vehicle, and the outboard, front seat passenger, if any. When more than 25 observations were made at a site, additional sheets were used and all sheets for the observation site-period were fastened together.

Survey teams recorded vehicle type, occupant gender, and occupant race, in addition to belt or helmet use for the passing vehicles.

Building a Data Set

Observation data were keypunched by Preusser Research Group, Inc. staff into the Statistical Package for the Social Sciences (SPSS) software. A thorough check of the nighttime survey data yielded minimal keypunch errors, all of which were corrected pre-analysis.

Data Analysis

PRG used the nighttime survey data to calculate overall seat belt use rates, both raw and weighted. PRG also calculated results for differences in region, occupant type, gender, race, vehicle type and road type. PRG made specific comparisons between the nighttime survey results and results from the simultaneously conducted daytime survey.

RESULTS

Data collectors observed nighttime seat belt use at 40 sites across eight Louisiana Parishes between May 26th and June 5th, 2015. One site was dropped in 2012 due to an insufficient vehicle count, and while data was collected at that site for 2013 and 2015 (five vehicles each year), we removed it from the sample for the sake of consistency for a total of 39 sites. PRG observed daytime seat belt use at the same 39 sites between May 29th and June 12th, 2015. Table 1 displays the number of front seat occupants observed per Parish, at nighttime and daytime, across the 39 observation sites. PRG observed considerably fewer vehicles and occupants travelling during the nighttime compared to daytime. Due to the very low occurrence, coupled with desired comparability to the previous surveys, rear seat occupants and motorcycle operators are not included in the counts or results that follow – for both night and daytime.

TABLE 1. Number Occupants Observed at Nighttime & Daytime

| Parish | Drivers Observed | Passengers Observed | Total Occupants Observed |
|-------------------------|---------------------|------------------------|-----------------------------|
| Jefferson | | | |
| Nighttime | 399 | 104 | 503 |
| Daytime | 1,066 | 188 | 1,254 |
| East Baton Rouge | | | |
| Nighttime | 402 | 88 | 490 |
| Daytime | 1,475 | 334 | 1,809 |
| St. Charles | | | |
| Nighttime | 613 | 167 | 780 |
| Daytime | 1,274 | 244 | 1,518 |
| Lafayette | | | |
| Nighttime | 644 | 181 | 825 |
| Daytime | 1,050 | 204 | 1,254 |
| Calcasieu | | | |
| Nighttime | 719 | 290 | 1,009 |
| Daytime | 964 | 299 | 1,263 |
| Rapides | | | |
| Nighttime | 243 | 72 | 315 |
| Daytime | 695 | 141 | 836 |
| Caddo | | | |
| Nighttime | 509 | 127 | 636 |
| Daytime | 978 | 329 | 1,307 |
| Ouachita | | | |
| Nighttime | 335 | 63 | 398 |
| Daytime | 839 | 137 | 976 |
| Night Total | 3,864 | 1,092 | 4,956 |
| Day Total | 8,341 | 1,876 | 10,217 |

PRG recorded data on 4,956 front seat occupants (3,864 drivers and 1,092 passengers) at night. The number of occupants observed ranged from 315 (Rapides Parish) to 1,009 (Calcasieu Parish). The number of drivers ranged from 243 (Rapides Parish) to 719 (Calcasieu Parish) and the number of passengers ranged from 63 (Ouachita Parish) to 290 (Calcasieu Parish).

PRG recorded data on 10,217 front seat occupants (8,341 drivers and 1,876 passengers) across same the 39 sites at daytime. The number of occupants observed ranged from 836 (Rapides Parish) to 1,809 (East Baton Rouge Parish). The number of drivers ranged from 695 (Rapides Parish) to 1,435 (East Baton Rouge Parish) and the number of passengers ranged from 137 (Ouachita Parish) to 334 (East Baton Rouge Parish).

Table 2 displays nighttime and daytime sample characteristics. Notable similarities between the nighttime and daytime samples included a higher percentage of male occupants observed on the road compared to female occupants (around 55% to 45%); a higher percentage of white occupants versus non-white (about 2 to 1); and a higher ratio of occupants observed on State Roads than on Interstate Ramps (about 2 to 1). Differences between the night and day samples included a greater proportion of passengers observed at nighttime than at daytime (22% vs. 18%); a slight increase in the proportion of Black occupants observed (28% vs. 24%); a smaller percentage of pickup trucks observed at nighttime than at daytime (22% vs. 26%); and a greater proportion of passenger cars observed at nighttime compared to daytime (52% vs. 41%).

TABLE 2.
Sample Characteristics across 39 Survey Sites*

| | Nighttime Survey % (n) | Daytime Survey % (n) |
|----------------------|---------------------------|-------------------------|
| Occupant Type | | |
| Driver | 78% (3,864) | 82% (8,341) |
| Passenger | 22% (1,092) | 18% (1,876) |
| | 100% | 100% |
| Gender | | |
| Male | 56% (2,793) | 55% (5,654) |
| Female | 44% (2,159) | 45% (4,542) |
| | 100% | 100% |
| Race | | |
| White | 66% (3,263) | 70% (7,075) |
| Black | 28% (1,370) | 24% (2,453) |
| Hispanic | 4% (196) | 4% (453) |
| Other | 2% (111) | 2% (185) |
| | 100% | 100% |
| Vehicle Type | | |
| Pickup Truck | 22% (1,087) | 26% (2,674) |
| Passenger Car | 52% (2,593) | 41% (4,186) |
| SUV | 22% (1,073) | 27% (2,740) |
| Van | 4% (203) | 6% (617) |
| | 100% | 100% |
| Road Type | | |
| Interstate Ramp | 30% (1,495) | 36% (3,695) |
| State Road | 70% (3,461) | 64% (6,522) |
| | 100% | 100% |

*for known belt use occupants

Table 3 and Figure 3 display the results of the nighttime and daytime surveys. The nighttime seat belt observations indicated an 85.0% use rate, based on raw data counts. The daytime use rate, also based on raw data counts, was 90.3%. Because the number of observed occupants varied among the survey sites, PRG averaged the use rates for all 39 observation sites to control for disproportionate weighting of some sites over others. Equally weighting the sites (1:1) estimated the nighttime use rate at 84.4%. Weighting the daytime survey data (1:1) indicated an 89.8% use rate across these same observation sites during daylight hours.

TABLE 3.
2015 Seat Belt Use Rate at Nighttime and Daytime¹

| | Night | Day |
|---------------------------|------------------|-------------------|
| Use Rate - Raw | 85.0% (4,956) | 90.3% (10,217) |
| Use Rate – (Averaged 1:1) | 84.4% | 89.8% |

¹Data collected at 39 observation sites; not statewide.

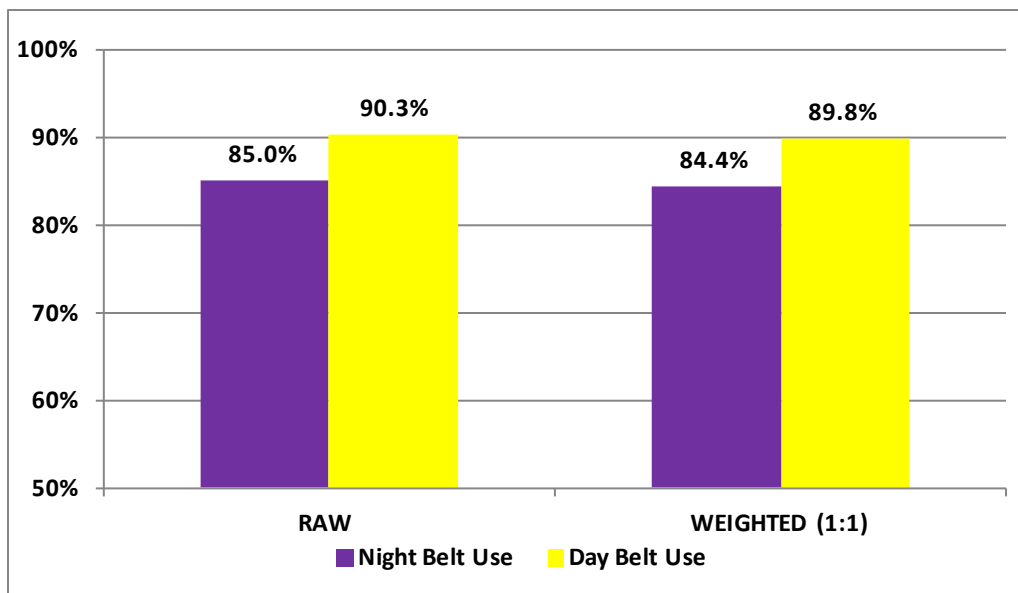


Figure 3: Seat Belt Use at Night & Day across 39 Observation Sites in Louisiana

Figure 4 shows seat belt use rates at night and at day by Parish (raw data). Data in this Figure do not represent Parish-wide use rates. PRG did not design the nighttime survey to give Parish-wide use rates. The data presented here show that belt use was lower at night than at day in seven of the eight Parishes. The difference between night and day use was least in Rapides Parish (1.3 percentage points), where night use measured higher than day. Rapides also had the least number of occupants observed in both night and daytime. The difference between night and day was greatest in Caddo Parish (11.9 percentage points), which also measured lowest overall in nighttime belt use across the five observation sites per Parish.

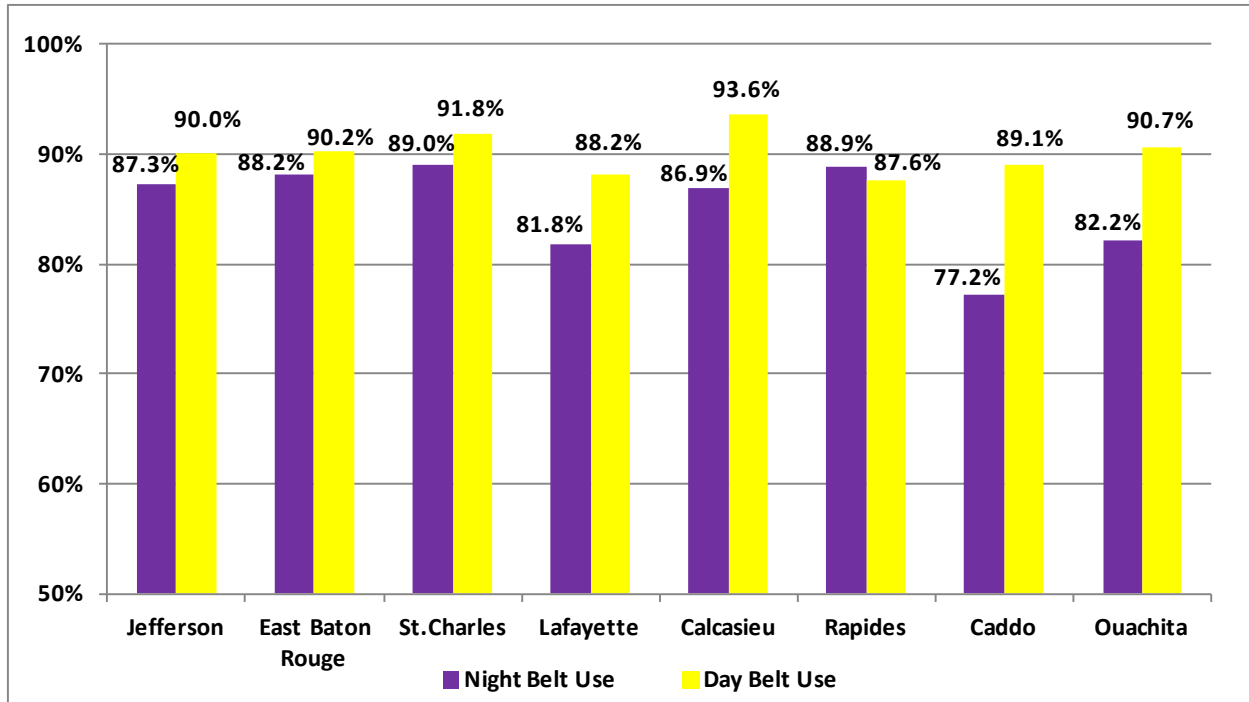


Figure 4: Difference in Seat Belt Use at Night & Day by Survey Parish

Figure 5 shows driver and passenger belt use rates separately at nighttime and at daytime. Driver belt use at nighttime was clearly lower than driver use at daytime (84.0% vs. 90.5%). However, front seat passenger belt use measured only slightly lower at night than at day (88.7% vs. 89.2%). Driver belt use measured higher than passenger use during the day. The reverse was true at night when passenger belt use was higher than driver use. Sample characteristics reveal a slightly higher proportion of passengers at night (versus day), and that females make up 63.5% of the nighttime passenger sample.

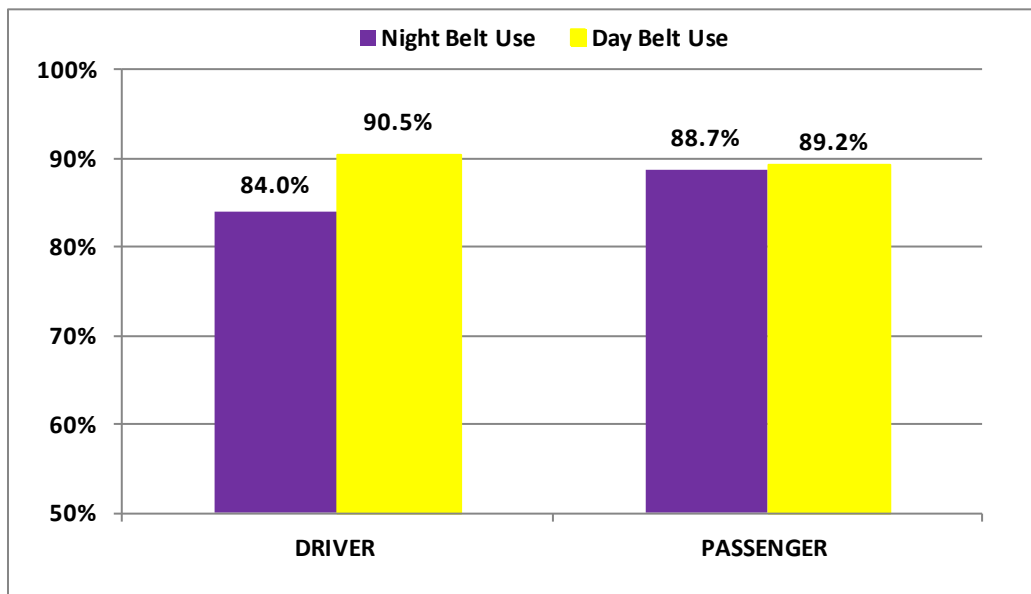


Figure 5: Difference in Seat Belt Use at Night & Day by Occupant Type

As prefaced above, observation data indicated that female occupants wear their seat belt more often than male occupants and that was true at night and at day (Figure 6). Belt usage at nighttime was lower for both genders with a greater disparity among male occupants (7.5 percentage points) than for the female occupants (2.2 percentage points).

Occupants of all races were also observed using their seat belt less often at nighttime compared to daytime (Figure 7). The survey data indicated that Black occupants used seat belts least often during the night and day.

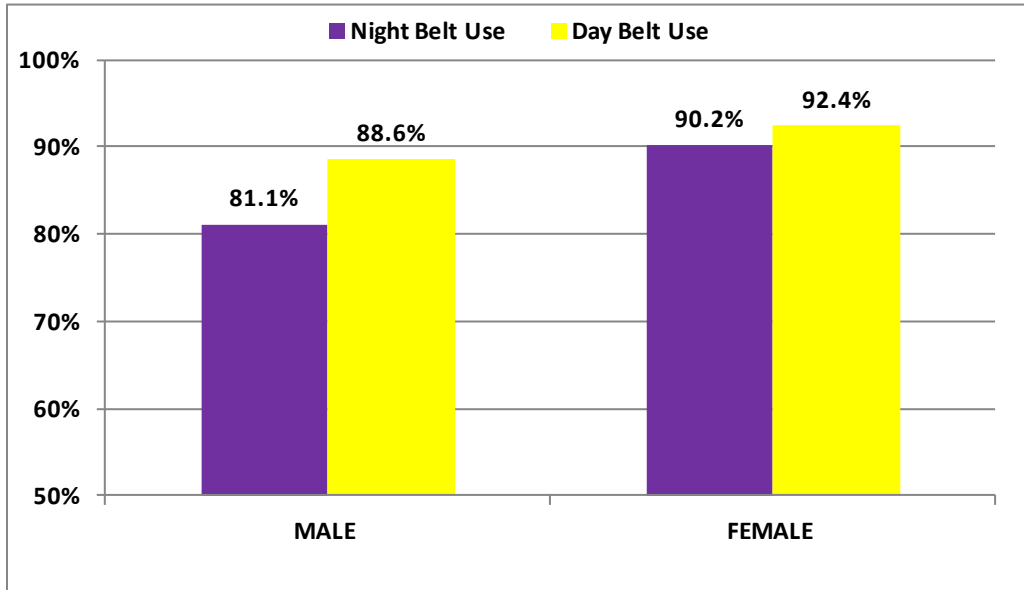


Figure 6: Difference in Seat Belt Use at Night & Day by Occupant Gender

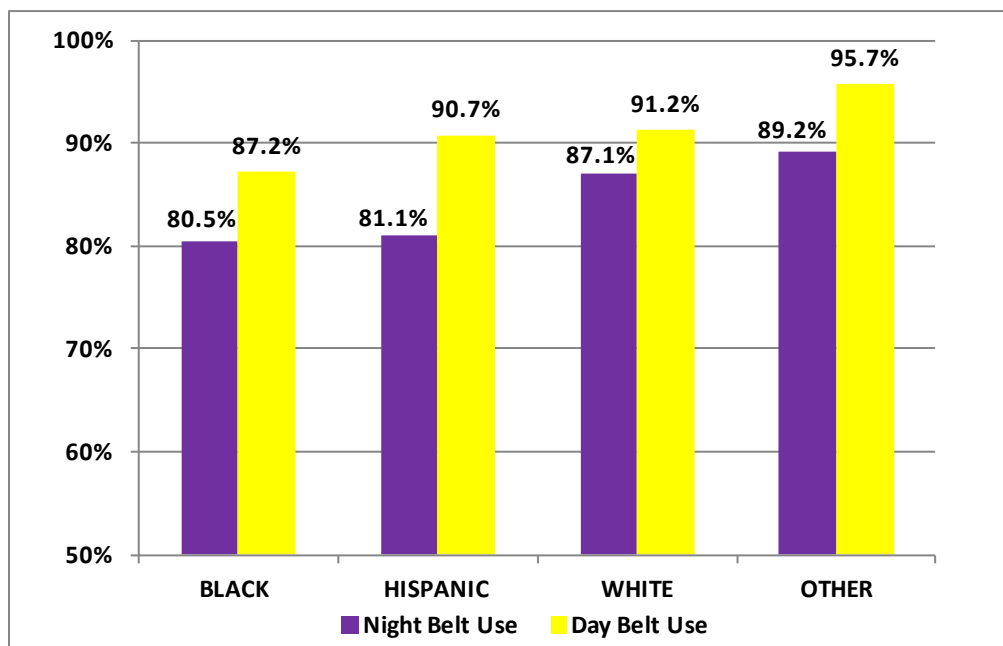


Figure 7: Difference in Seat Belt Use at Night & Day by Occupant Race

Figure 8 shows the seat belt use rate among pickup truck occupants compared to all other vehicle types³. Observations found seat belt use was lower at night among occupants in all types of vehicles. Belt use measured particularly low among occupants in pickup trucks at nighttime (78.7%).

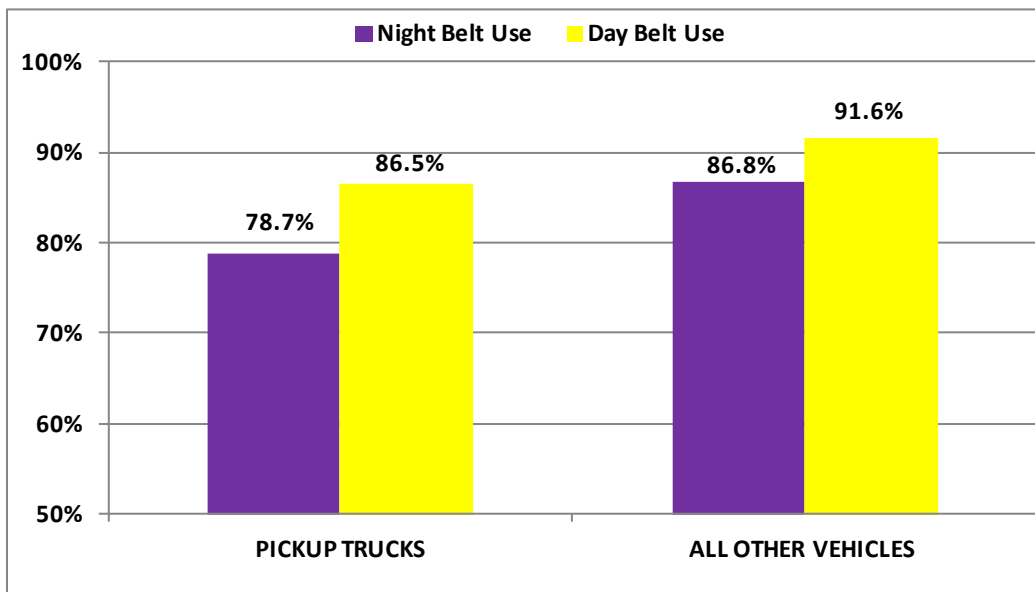


Figure 8: Difference in Seat Belt Use at Night & Day for Occupants in Pickup Trucks

Seat belt use measured lower at night than at day on both roadway types used in the nighttime survey (Figure 9), with a slightly larger differential observed on State Routes (5.8 vs. 3.9 percentage points).

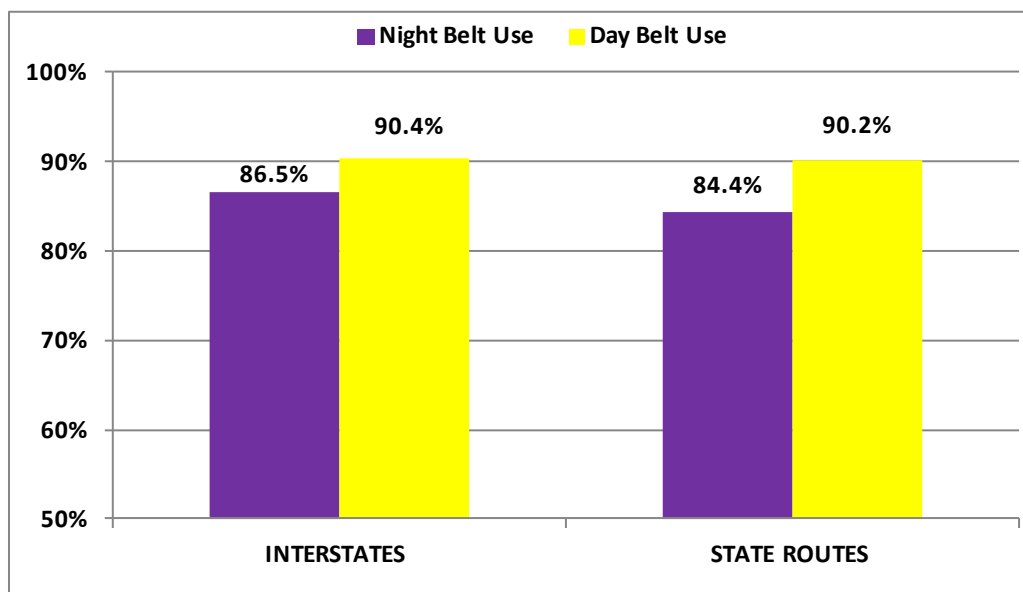


Figure 9: Difference in Seat Belt Use at Night & Day by Road Type

³ Excludes Motorcycles (helmet use)

CONCLUSION

Louisiana’s nighttime seat belt survey provided clear and direct evidence that seat belts are worn less often at night than day on Louisiana roadways. This was true in seven of eight regions of the State where observations occurred, and across all characteristics measured in the survey data.

Patterns in seat belt use, normally seen at daytime were also evident at night. Male belt use is lower than female belt use; occupants in pickup trucks use seat belts less than occupants in other vehicle types; and Black occupants wear seat belts less than occupants of other races.

The nighttime survey design presented here can be used for direct comparison with daytime survey data; especially for 2015, when both day and night surveys ran concurrently. Demographic characteristics are mostly similar to past night surveys, though the 2015 survey yielded a slightly higher proportion of Black and State Road occupants than in previous measures.

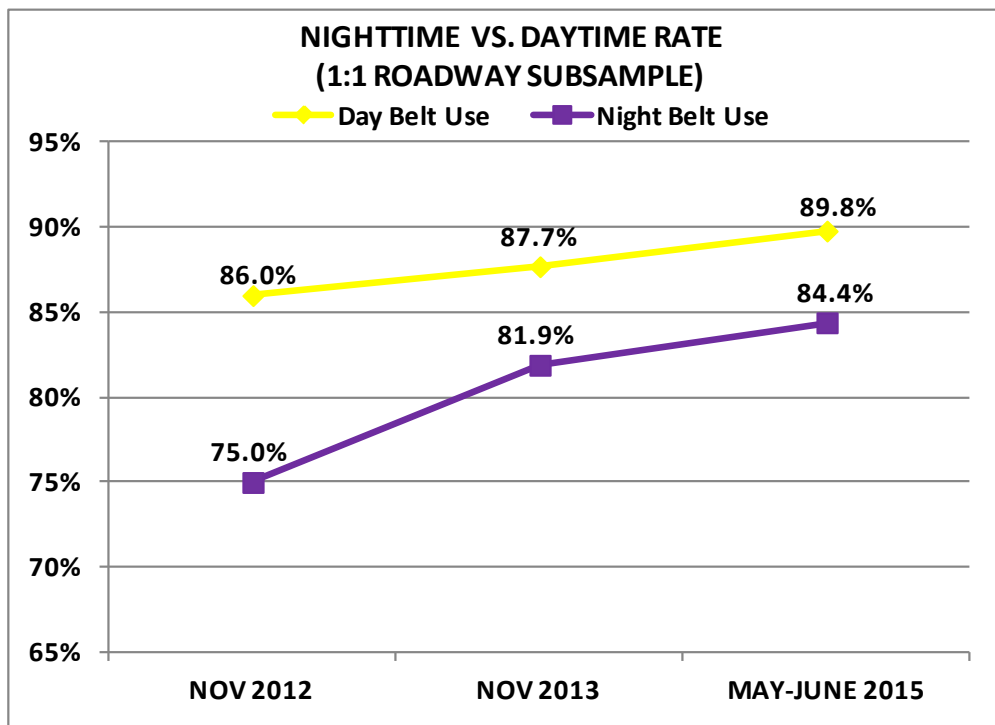


Figure 10: 2012-2015 1:1 Weighted Subsample of Seat Belt Use Rate at Night & Day

Figure 10 graphs the trend in belt usage at both day and nighttime since the night survey was first implemented. 2013 -2015 did not see quite the gain in nighttime use that 2012 - 2013 had, though rates are trending in the right direction and the gap in usage between day and night appears to be steadily closing. Past and future surveys following the same design can provide an indication of where change is happening in the State of Louisiana and in regards to whom. Results from these surveys should be used to motivate and educate highway safety practitioners to the problem of lower seat belt use at nighttime, as well as to the potential for improvement.

Appendix A

Nighttime Seat Belt Survey Observation Site Locations

| Site Number | Parish | Highway Type | Road Name | Road Section Length | Latitude | Longitude |
|-------------|----------------|--------------|-----------|---------------------|-----------|-----------|
| 126101 | Jefferson | Interstates | 10 | 1.71 | 29.999180 | 90.183870 |
| 126102 | Jefferson | Interstates | 10 | 1.15 | 30.008680 | 90.227120 |
| 126201 | Jefferson | US&State | 48 | 0.98 | 29.938290 | 90.212440 |
| 126204 | Jefferson | US&State | 61 | 1.34 | 29.975980 | 90.187390 |
| 126206 | Jefferson | US&State | 90 | 0.82 | 29.958960 | 90.173270 |
| 217102 | E. Baton Rouge | Interstates | 10 | 3.40 | 30.382980 | 91.066850 |
| 217105 | E. Baton Rouge | Interstates | 10 | 0.40 | 30.424670 | 91.154560 |
| 217203 | E. Baton Rouge | US&State | 1248 | 0.70 | 30.388570 | 91.093060 |
| 217208 | E. Baton Rouge | US&State | 3246 | 0.44 | 30.384480 | 91.064850 |
| 217215 | E. Baton Rouge | US&State | 1248 | 1.32 | 30.337710 | 91.116100 |
| 345102 | St. Charles | Interstates | 310 | 2.11 | 29.937430 | 90.376850 |
| 345103 | St. Charles | Interstates | 310 | 3.87 | 29.975260 | 90.319040 |
| 345201 | St. Charles | US&State | 90 | 0.79 | 29.875980 | 90.437830 |
| 345202 | St. Charles | US&State | 3127 | 8.71 | 29.993590 | 90.499950 |
| 345203 | St. Charles | US&State | 90 | 1.69 | 29.882560 | 90.427070 |
| 428101 | Lafayette | Interstates | 10 | 0.45 | 30.268280 | 91.993890 |
| 428102 | Lafayette | Interstates | 10 | 1.67 | 30.247080 | 92.066450 |
| 428203 | Lafayette | US&State | 3073 | 2.04 | 30.176710 | 92.072840 |
| 428205 | Lafayette | US&State | 182 | 0.96 | 30.188430 | 92.014000 |
| 428208 | Lafayette | US&State | 726 | 0.33 | 30.321740 | 92.038560 |
| 510102 | Calcasieu | Interstates | 10 | 1.20 | 30.227110 | 93.304230 |
| 510104 | Calcasieu | Interstates | 210 | 0.77 | 30.196710 | 93.274320 |
| 510203 | Calcasieu | US&State | 171 | 0.20 | 30.246670 | 93.180550 |
| 510205 | Calcasieu | US&State | 171 | 1.27 | 30.311600 | 93.195600 |
| 510207 | Calcasieu | US&State | 385 | 1.81 | 30.176210 | 93.218530 |
| 640102 | Rapides | Interstates | 49 | 6.71 | 31.070860 | 92.433210 |
| 640202 | Rapides | US&State | 165 | 4.26 | 31.170530 | 92.502840 |
| 640204 | Rapides | US&State | 71 | 0.27 | 31.276150 | 92.470210 |
| 640205 | Rapides | US&State | 167 | 0.34 | 31.303840 | 92.446540 |
| 709101 | Caddo | Interstates | 220 | 2.86 | 32.520220 | 93.808840 |
| 709104 | Caddo | Interstates | 49 | 1.67 | 32.420290 | 93.749560 |
| 709204 | Caddo | US&State | 1 | 1.43 | 32.479980 | 93.722270 |
| 709205 | Caddo | US&State | 3132 | 3.69 | 32.456080 | 93.844330 |
| 709209 | Caddo | US&State | 80 | 0.42 | 32.452390 | 93.858530 |
| 837103 | Ouachita | Interstates | 20 | 1.62 | 32.510810 | 92.193530 |
| 837104 | Ouachita | Interstates | 20 | 1.26 | 32.498490 | 92.075950 |
| 837204 | Ouachita | US&State | 546 | 4.74 | 32.460550 | 92.294180 |
| 837205 | Ouachita | US&State | 165 | 2.56 | 32.647500 | 92.057230 |
| 837207 | Ouachita | US&State | 143 | 1.42 | 32.547240 | 92.149330 |

Appendix B

Seat Belt/Helmet Use Observation Data Form

SITE NUMBER: _____ SITE: _____ OBSERVER INITIALS: _____

DIRECTION OF TRAFFIC FLOW: N S E W

CHECK ONE: _____ DAYTIME _____ NIGHTTIME

DATE: ____ - ____ - ____ DAY OF WEEK: _____

START TIME: _____ AM / PM (Observation period will last exactly 60 minutes)

| WEATHER CONDITIONS | |
|--------------------|----------------------|
| 1. Clear/Sunny | 4. Fog |
| 2. Light Rain | 5. Wet (Not Raining) |
| 3. _____ | Cloudy |

| Veh. # | VEHICLE | DRIVER | | | PASSENGER | | |
|--------|--|--|--|--|--|--|--|
| | <u>Veh. Type</u> C=Car T=Truck S=SUV V=Van M=Motorcycle | <u>Sex</u> M=Male F=Female U=Unsure | <u>Race</u> W=White B=Black H=Hispanic O=Other U=Unsure | <u>Belt/ Helmet Use</u> Y = Yes N = No U=Unsure | <u>Sex</u> M=Male F=Female U=Unsure | <u>Race</u> W=White B=Black H=Hispanic O=Other U=Unsure | <u>Belt/ Helmet Use</u> Y = Yes N = No U=Unsure |
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| 25 | | | | | | | |

Seat Belt Observation Data Form (back)

Location: _____
(Street) (Cross Street or other landmark)

Site #: _____

Notes:

Diagram:

