
2022 LOUISIANA NIGHTTIME ADULT SEAT BELT OBSERVATION SURVEY RESULTS

-FINAL REPORT-

LHSC Project No. 2023-20-10

STATE OF LOUISIANA
John Bel Edwards, Governor



January 31, 2023

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This report is a product of Preusser Research Group, Inc. under contract with The Louisiana Highway Safety Commission. The work presented here was completed under LHSC Project Number 2023-20-10.



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INTRODUCTION

Approximately one-quarter of traffic-related fatalities across the United States occur between the hours of 10 p.m. and 4 a.m.¹ This window of time represents 25 percent of the 24-hour day but only 10-15 percent of daily traffic (Hallenbeck, 1997). A contributing factor to increased fatalities at night is lower seat belt usage, which is confirmed by data from the National Highway Traffic Safety Administration’s Fatality Analysis Reporting System (FARS). This nationwide trend is also true in Louisiana, where the seat belt usage rate among fatalities was only **40 percent** in 2020 (down from 48% in 2018)² and from the hours of 9 p.m. through 6 a.m., belt usage is consistently lower than average (Figure 1).

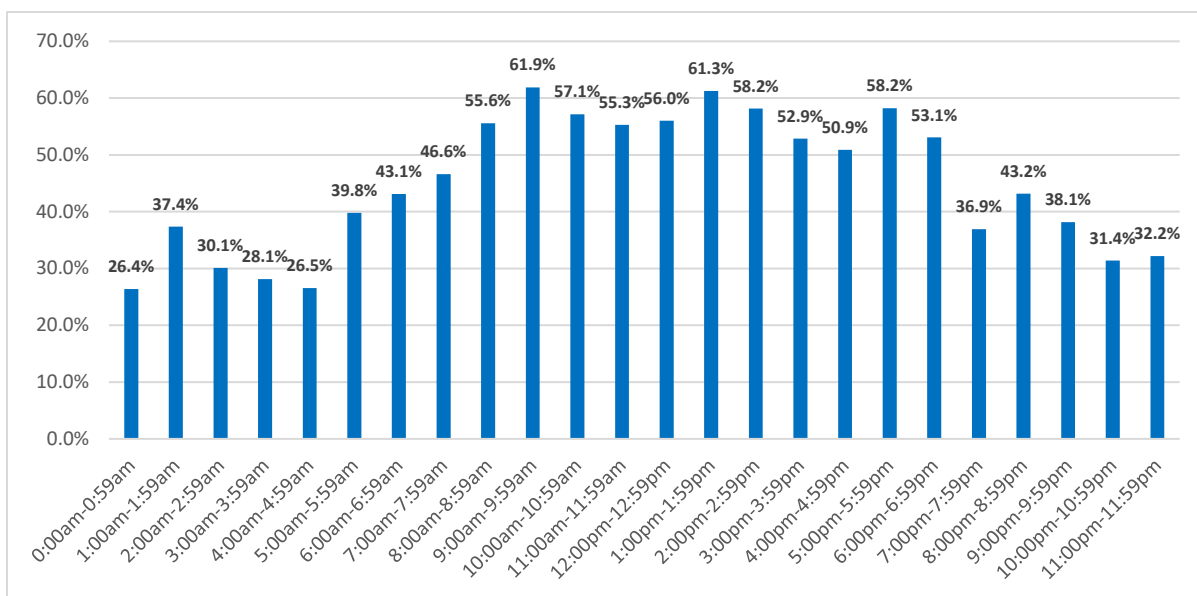


Figure 1: Percent of Louisiana Fatalities Wearing a Seat Belt by Hour; Passenger Vehicle Deaths 2016-2020

Preusser Research Group, Inc. (PRG), conducted the very first statewide seat belt survey at night in Connecticut, using the same locations during both day and night (Chaudhary & Preusser, 2006). This study used Connecticut’s design for daytime survey and adapted it for the nighttime survey. Nighttime observation procedures were similar to the daytime observation procedures, to the extent possible. The results showed that use rates during the daytime (83%) was significantly higher than during the nighttime (77%). PRG conducted a second study (Solomon, Chaudhary, & Preusser, 2007) that resulted in similar findings in New Mexico. New Mexico’s results showed that nighttime seat belt use was 6.2 percentage points lower than daytime seat belt use.

PRG, under contract with the State of Louisiana, initially 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

¹ 23.8% in 2020 according to a National Highway Traffic Safety Administration’s Fatality Analysis Reporting System (FARS) query by crash hour.

² Source: NHTSA FARS STSI ARF

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, 40 sites visited for the daytime survey were selected for nighttime observation and analyses. PRG replicated this nighttime seat belt survey for the state in November 2013, and again May/June of 2015. For the September 2017 nighttime survey, sites were reselected due to the resample of the statewide daytime survey. For the August 2018 and November 2019 surveys, the 2017 sites were utilized again. The current 2022 survey was the first time the survey was conducted since 2019, therefore new site locations were selected due the 2022 resample for the statewide daytime survey.

METHODOLOGY

Nighttime Survey Site Selection

In 2022, 40 nighttime observation sites were randomly selected from the list of resampled observation sites used in Louisiana’s 2022 daytime statewide survey. The nighttime sites were selected from a subset of only interstate roadways and state roads. Local roads were not eligible for the sample because they would likely result in too few vehicles at night for the analyses. For the inaugural survey in 2012, 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 there would be enough 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. For both 2017 and 2022 site resamples, these same parishes were used for consistency and for the sake of comparability to past data.

For each sampling year (2012, 2017, and 2022), five sites were selected per parish, for a total of 40 sites overall. More specifically, PRG selected two interstate ramp sites and three state/US routes per parish. When a parish had more than two interstates or more than three state/US routes eligible for inclusion, sites were randomly selected. The newly selected sites for 2022 will remain in use for future night surveys until the next daytime resample.

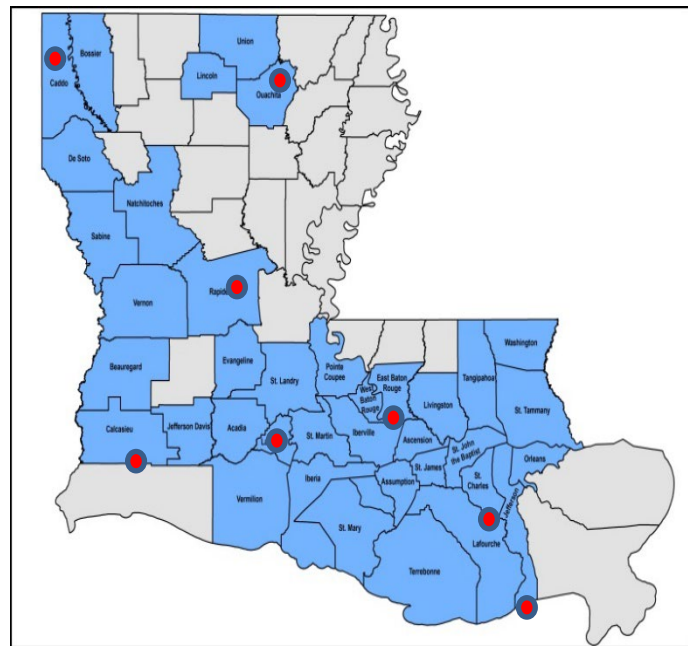


Figure 2: Parishes included In the Nighttime Survey

Nighttime Survey Scheduling

PRG assigned each of the two survey teams to four parishes. The survey teams completed all five observations per parish in a single night. Teams were assigned one parish each for Friday night measurements (25% of the total sites), to have both weeknight and weekend nights fairly represented. The other parishes were observed over Tuesday, Wednesday, and Thursday nights. 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 randomly, with earlier preference given to more rural locations. PRG also provided the survey teams a reference diagram for each observation site. These site diagrams provided information on exactly where the surveyor stood during the daytime observation, 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 daytime collection methods, and then mapped and/or noted any differences.

Several alternate sites were selected and mapped in the event any site was compromised due to construction, weather, or re-routing of traffic. However, the alternate sites were not needed this iteration.

Nighttime Survey Observers

PRG utilized two teams, each consisting of one trained observer and one trained data recorder. Both observers have extensive experience conducting seat belt observations, both daytime and nighttime, including work on substantial parts of past and present Louisiana daytime surveys. Additionally, all surveyors have had ample experience utilizing night vision technology (which were used when necessary).

Night vision goggles were used in tandem with infrared spotlights to provide adequate illumination of the vehicle occupants without adversely affecting them. The survey teams were trained to use this technology when sufficient ambient lighting was unavailable 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



Night Vision Goggles



Infrared Spotlight

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 and right front seat passengers were observed for seat belt use. Observers recorded vehicle type (car, truck, SUV, van), 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 A.

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. 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.

Building a Data Set

Observation data were keypunched by PRG staff into Excel spreadsheets and then examined using 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 November 29 and December 9, 2022. PRG had previously observed daytime seat belt use at the same 40 sites between June 10 and June 28, 2022. Table 1 displays the number of front seat occupants observed per parish, at nighttime and daytime, across the 40 observation sites. PRG observed considerably fewer vehicles and occupants travelling during the nighttime compared to daytime.

TABLE 1. Number Occupants Observed at Nighttime & Daytime

Parish	Drivers	Passengers	Total Occupants
	Observed	Observed	Observed
Jefferson			
Nighttime	588	99	687
Daytime	1,358	244	1,602
East Baton Rouge			
Nighttime	465	96	561
Daytime	1,235	222	1,457
St. Charles			
Nighttime	330	75	405
Daytime	1,142	236	1,378
Lafayette			
Nighttime	445	104	549
Daytime	952	244	1,196
Calcasieu			
Nighttime	250	69	319
Daytime	276	58	334
Rapides			
Nighttime	87	12	99
Daytime	290	81	371
Caddo			
Nighttime	249	62	311
Daytime	478	163	641
Ouachita			
Nighttime	317	92	409
Daytime	549	110	659
Night Total	2,731	609	3,340
Day Total	6,280	1,358	7,638

PRG recorded data on 3,340 front seat occupants (2,731 drivers and 609 passengers) at night. The number of occupants observed ranged from 99 (Rapides Parish) to 687 (Jefferson Parish). The number of drivers ranged from 87 (Rapides Parish) to 588 (Jefferson Parish) and the number of passengers ranged from 12 (Rapides Parish) to 104 (Lafayette Parish).

PRG recorded data on 7,638 front seat occupants (6,280 drivers and 1,358 passengers) across same the 40 sites at daytime. The number of occupants observed ranged from 334 (Calcasieu Parish) to 1,602 (Jefferson Parish). The number of drivers ranged from 276 (Calcasieu Parish) to 1,358 (Jefferson Parish) and the number of passengers ranged from 58 (Calcasieu Parish) to 244 (Jefferson and Lafayette Parishes).

Table 2 displays nighttime and daytime sample frequencies. Notable parallels between the nighttime and daytime samples include similar distributions of drivers and passengers; more male occupants observed on the road compared to female occupants (slightly more than half of the occupants were male), and a similar distribution in race. Differences between the night and day samples included a slight decrease in the proportion of White occupants observed at night (58% vs. 62% in the day), a larger proportion of passenger car occupants observed at nighttime than at daytime (47% vs. 32%), and a smaller proportion of SUV occupants at night (28% vs 38%). Also notable is the decrease in Interstate occupants at night versus day in the sample (32% vs 42%). As a result, there were more State Road travelling occupants at night than during the day (68% vs. 58%).

TABLE 2.
Sample Characteristics across 40 Survey Sites*

	Nighttime Survey % (n)	Daytime Survey % (n)
Occupant Type		
Driver	82% (2,731)	82% (6,280)
Passenger	28% (609)	28% (1,358)
Gender		
Male	54% (1,803)	55% (4,184)
Female	46% (1,536)	45% (3,449)
Unknown	0% (1)	0% (5)
Race		
White	58% (1,928)	62% (4,732)
Black	34% (1,127)	33% (2,508)
Hispanic	5% (174)	4% (307)
Other	3% (89)	1% (87)
Unknown	1% (22)	0% (5)
Vehicle Type		
Pickup Truck	22% (731)	26% (1,954)
Passenger Car	47% (1,566)	32% (2,419)
SUV	28% (933)	38% (2,910)
Van	3% (110)	5% (355)
Road Type		
Interstate Ramp	32% (1,072)	42% (3,180)
State Road	68% (2,268)	58% (4,458)

*for known belt use occupants

Table 3 and Figure 3 display overall nighttime and daytime survey results. The November/December 2022 nighttime seat belt observations indicated a 75.3 percent use rate, based on raw data counts. The May/June 2022 daytime use rate on the same roadways, also based on raw data counts, was 88.4 percent. Because the number of observed occupants varied among the survey sites, PRG averaged the use rates for all 40 observation sites to control for disproportionate weighting of some sites over others due to volume. Equally weighting the sites (1:1) estimated the nighttime use rate at 77.2 percent. Weighting the daytime survey data (1:1) resulted in an 87.3 percent use rate across these same observation sites during daylight hours.

TABLE 3.
2022 Seat Belt Use Rate at Nighttime & Daytime¹

	Night	Day	Difference (in percentage points)
Use Rate – Raw Counts	75.3% (3,340)	88.4% (7,638)	13.1
Use Rate – (Averaged 1:1)	77.2%	87.3%	10.1

¹ Data collected at 40 observation sites; not representative of statewide.

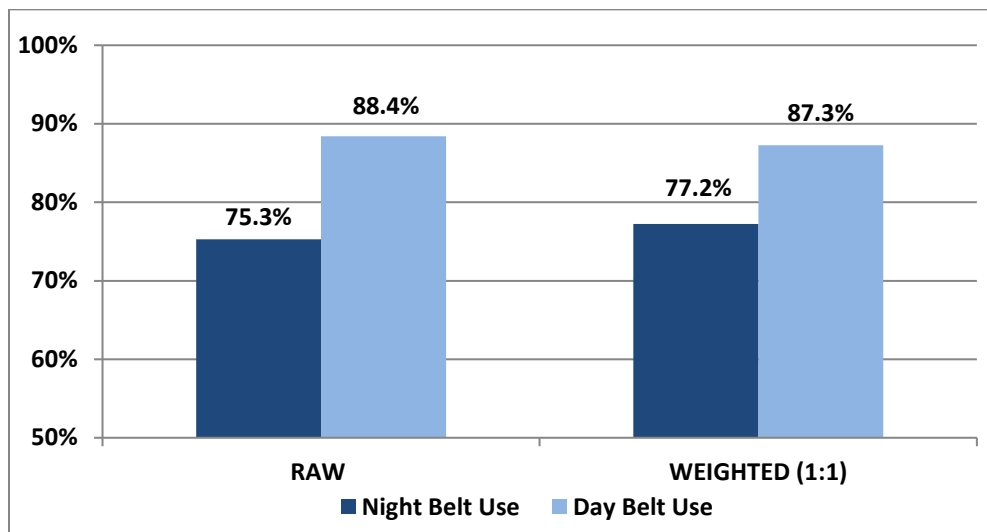


Figure 3: 2022 Seat Belt Use at Nighttime & Daytime across 40 Observation Sites in Louisiana

Figure 4, on the following page, represents a three-year average (2018, 2019, and 2022) of seat belt use rates at night and at day by parish.³ Due to low volume, seasonal differences in yearly measures, and newly selected sites for 2022, PRG feels this provides a better estimate of usage by Parish. However, data in Figure 4 do not represent parish-wide use rates. PRG did not design the nighttime survey to give parish-wide use rates as, on a parish level, the number of sites and the sample sizes are very small. Nonetheless, 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 greatest in Calcasieu Parish (10.1%), and least in Caddo Parish (where nighttime usage equaled daytime usage).

³ Note that this represents the most recent three *survey* years, and that the site locations changed for 2022.

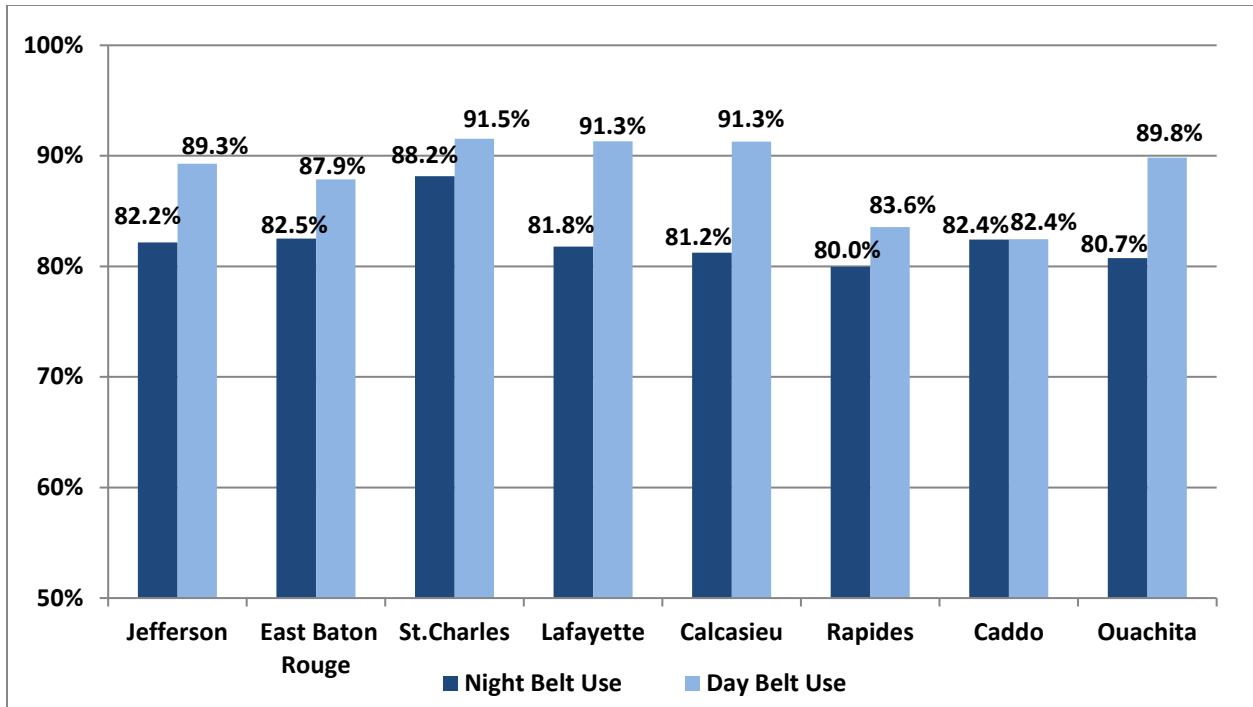


Figure 4: Difference in Seat Belt Use at Night & Day by Survey Parish (3-Year Average)

Female occupants wear their seat belts more often than male occupants and that was true both at night and day (Figure 5). The difference in use between men and women was greater at night than in the daytime. Belt usage at nighttime was considerably lower than at day for both sexes with a greater disparity among male occupants (16.5%) than for the female occupants (9.3%).

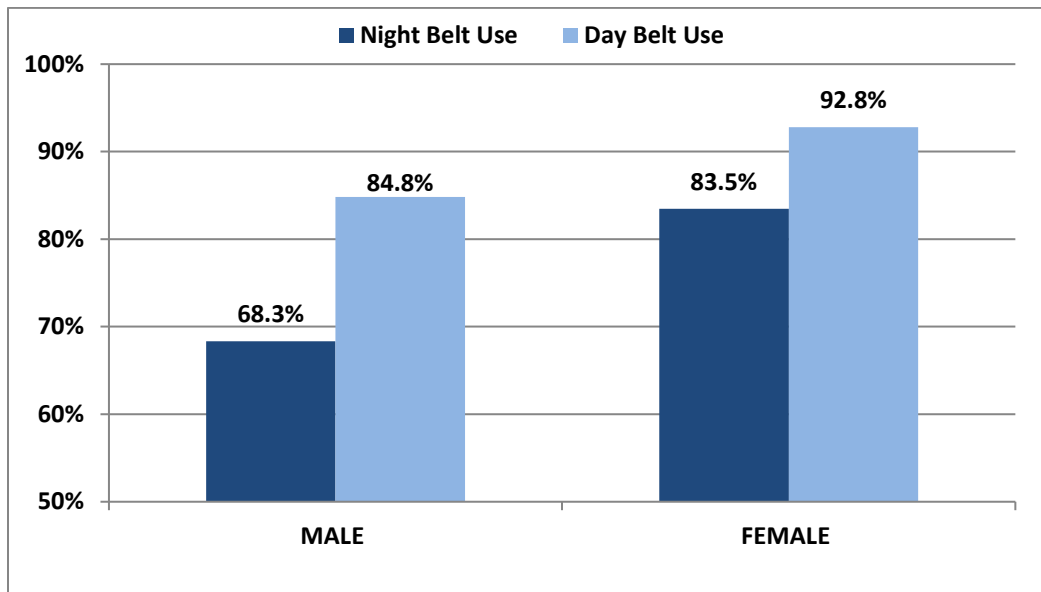


Figure 5: 2022 Difference in Seat Belt Use at Night & Day by Occupant Sex

Figure 6 shows driver and passenger belt use rates separately at nighttime and at daytime. While both occupant types exhibited lower usage at night, the differential in usage between drivers and passengers was more apparent at night (7.9%; versus 0.7% during the day). That is, during the daytime there was little difference between driver and passenger whereas at night the difference was more pronounced. Nearly 60 percent of the night drivers were male. Conversely, women made up most of night passengers (over 64%). Since men have lower belt usage levels than women, especially at night, this could help explain the bigger gap in driver vs. passenger use levels at night. That is, it is not driver versus passenger per se, but another way of showing male versus female occupant differences.

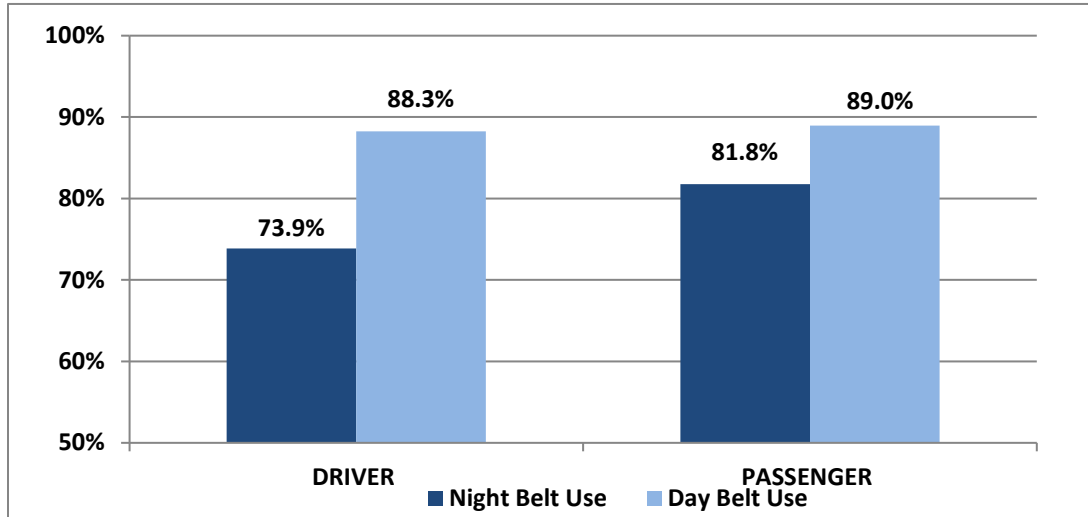


Figure 6: 2022 Difference in Seat Belt Use at Night & Day by Occupant Type

Breakdowns by race and ethnicity suggest that while all tend to wear belts less at night, occupants coded as Black had the highest usage differentials (Figure 7). Survey data from these locations also indicate that Black occupants had the lowest seatbelt use rate than all other race/ethnicities regardless of time of day, but much more so at night.

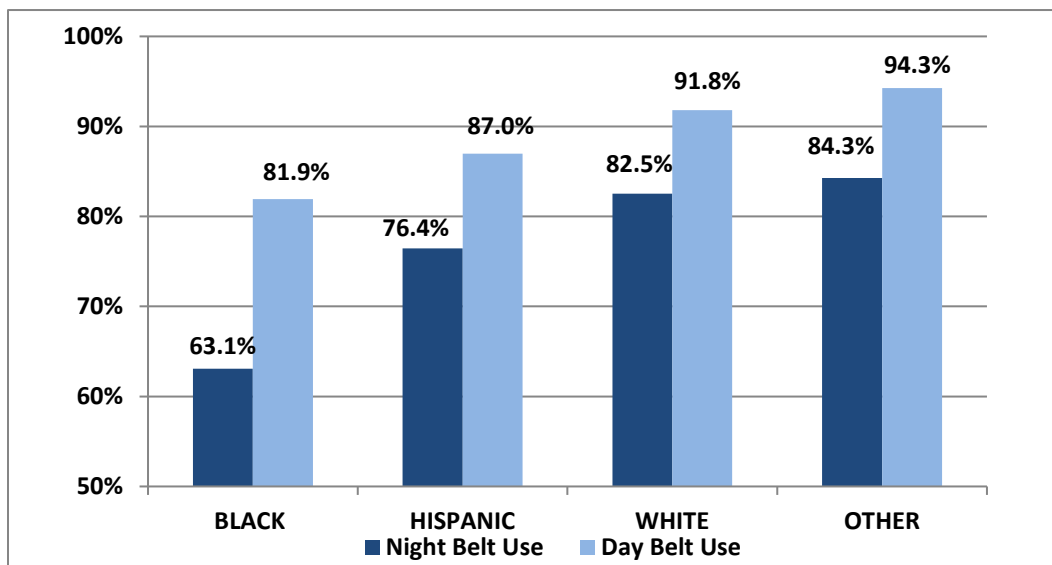


Figure 7: 2022 Difference in Seat Belt Use at Night & Day by Occupant Race/Ethnicity

Figure 8 shows the seat belt use rate among pickup truck occupants compared to all other vehicle types. 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 regardless of time of day, but even more so at nighttime (67.3%).

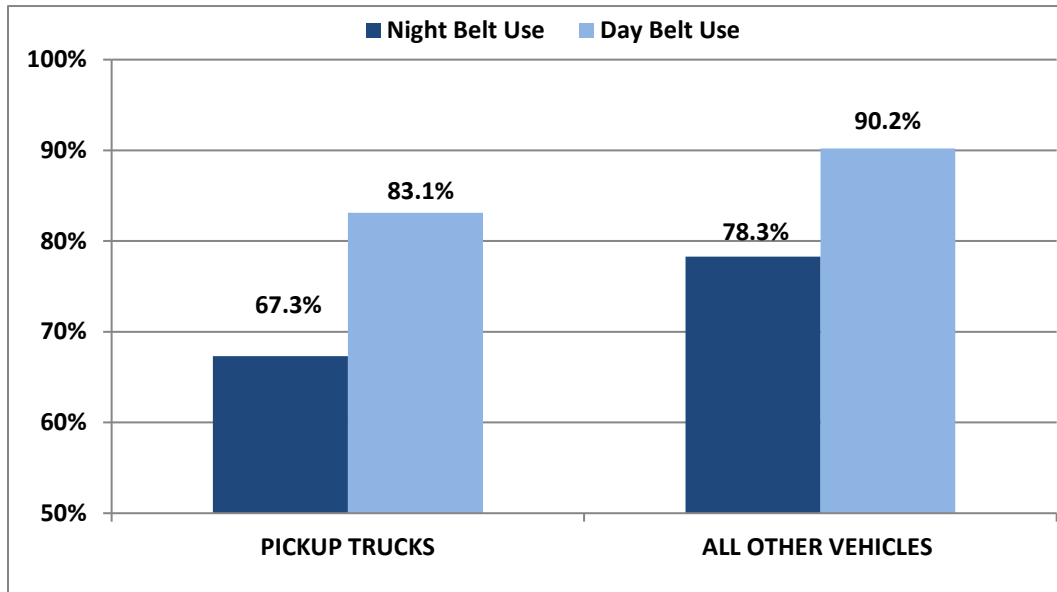


Figure 8: 2022 Difference in Seat Belt Use at Night & Day by Vehicle Type

Seat belt use measured lower at night than at day on both roadway types used in the nighttime survey (Figure 9), with greater differential in usage for occupants travelling on interstates (16.1 percentage points; vs. 10.4 percentage points on state routes).

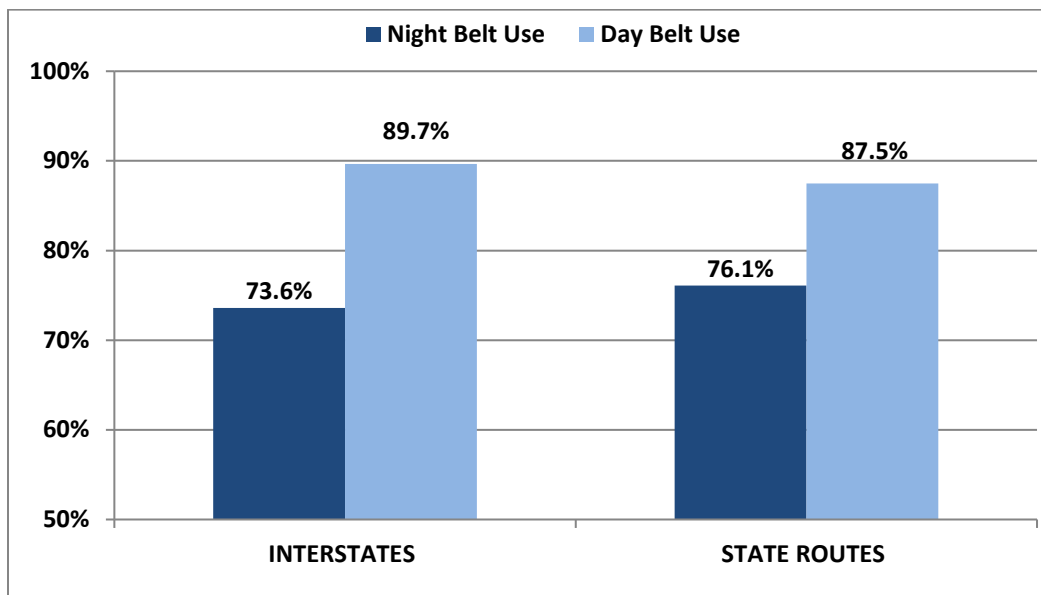


Figure 9: 2022 Difference in Seat Belt Use at Night & Day by Road Type

The 2022 Nighttime Seat Belt Survey provided evidence that seat belts are worn considerably less often at night than during the day on Louisiana roadways (Figure 10). The 1:1 weighted differential between night and day belt usage in 2022 (10.1 percentage points) is nearly as large as when the initial measure took place in 2012 (11.0 percentage points).

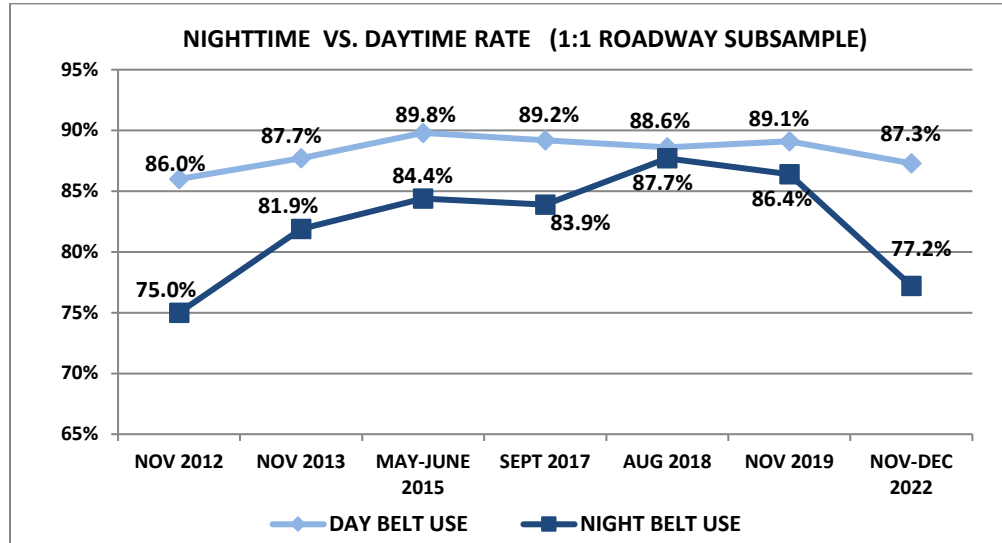


Figure 10: 2012-2022 1:1 Weighted Subsample of Seat Belt Use Rate at Night & Day

CONCLUSION

Since the first nighttime observational survey in Louisiana was conducted in November of 2012, surveys have been conducted in November 2013, May/June 2015, September 2017, August 2018, and back again in November for 2019 and 2022. The same observation sites were used in 2012, 2013, and 2015. The gap in nighttime and daytime belt usage appeared to be narrowing over that time. New observation sites were selected for the September 2017 survey to reflect the 2017 statewide daytime survey resample and the results generally pick up where the 2015 results left off. The gap between nighttime and daytime usage is essentially the same in September 2017 as it was in May/June 2015. However, in 2018, the same sites were revisited and an increase in nighttime usage was measured. For 2019, the increase leveled out somewhat and by 2022, with newly selected sites (as well as in a post COVID traffic and enforcement environment), usage at night retreated to near-2012 levels.

Patterns in seat belt use normally seen at daytime were evident at nighttime as well. That is, male occupant belt use is lower than female occupant belt use; occupants in pickup trucks use seat belts less often than occupants in other vehicle types. Although there was at least one difference in nighttime patterns compared to daytime, interstates have traditionally shown higher use rates than other functional classes during daytime observations. At night however, although slight, interstate travelers had lower seat belt usage than did state highway motorists.

It is unclear why the day/night gap was narrowing prior to this year. It could be that resources had been allocated to address the nighttime usage issue. However, results from this and previous observational surveys of nighttime seat belt use still indicate lower usage compared to daytime, particularly among certain subgroups. Past and present results could be used as a guide by highway safety practitioners to direct resources. Prior research has shown enforcement at night serves to increase use at night. Research has also indicated that, at least in fatal crashes, a large portion of unbelted night drivers are under the influence of drugs or alcohol. Thus, enforcement of the DUI/DWI laws may actually reduce unbelted fatalities at night. Educating the public, particularly those within the lower use demographics indicated in this and prior surveys, on the dangers of driving unrestrained at night may also have some impact. That said, most occupants are aware of the risks of driving unrestrained.

REFERENCES

Hallenbeck, M. E., Smith, B., Cornell-Martinez, C., & Wilkinson, J. (1997). Vehicle Volume Distributions Classification. FHWA-PL-97-025. Washington, DC: Federal Highway Administration.

Chaudhary, N. K. & Preusser, D. F. (2006). Connecticut nighttime safety belt use. *Journal of Safety Research*, 37, 353-358.

Solomon, M. G., Chaudhary, N. K., & Preusser, D. F. (2007). *Daytime and Nighttime Safety Belt Use at Selected Sites in New Mexico*. Final Report, DOT HS 810 705. Washington, DC: National Highway Traffic Safety Administration.

APPENDIX A: OBSERVATION FORM

Seat Belt 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

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

Pg: _____ of _____

Seat Belt Observation Data Form (back)

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

Site #: _____

Notes: _____

Diagram:

