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# 2019 LOUISIANA NIGHTTIME ADULT SEAT BELT OBSERVATION SURVEY RESULTS

-FINAL REPORT-

LHSC Project No. 2020-20-10-01

**STATE OF LOUISIANA**  
John Bel Edwards, Governor



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Prepared for:

**LOUISIANA HIGHWAY SAFETY COMMISSION**

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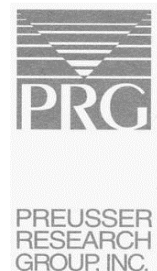
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## INTRODUCTION

Around one-quarter of traffic related fatalities across the United States occur between the hours of 10 p.m. and 4 a.m.<sup>1</sup> This window of time represents 25 percent of the 24-hour day but only 10 percent of daily traffic occurs during this time. 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). The same is also true in Louisiana, where the seat belt use rate among fatalities was only 48 percent in 2018 (**Source: NHTSA FARS STSI ARF**) and from the hours of 7 p.m. through 7 a.m., belt usage is consistently lower than average (Figure 1).

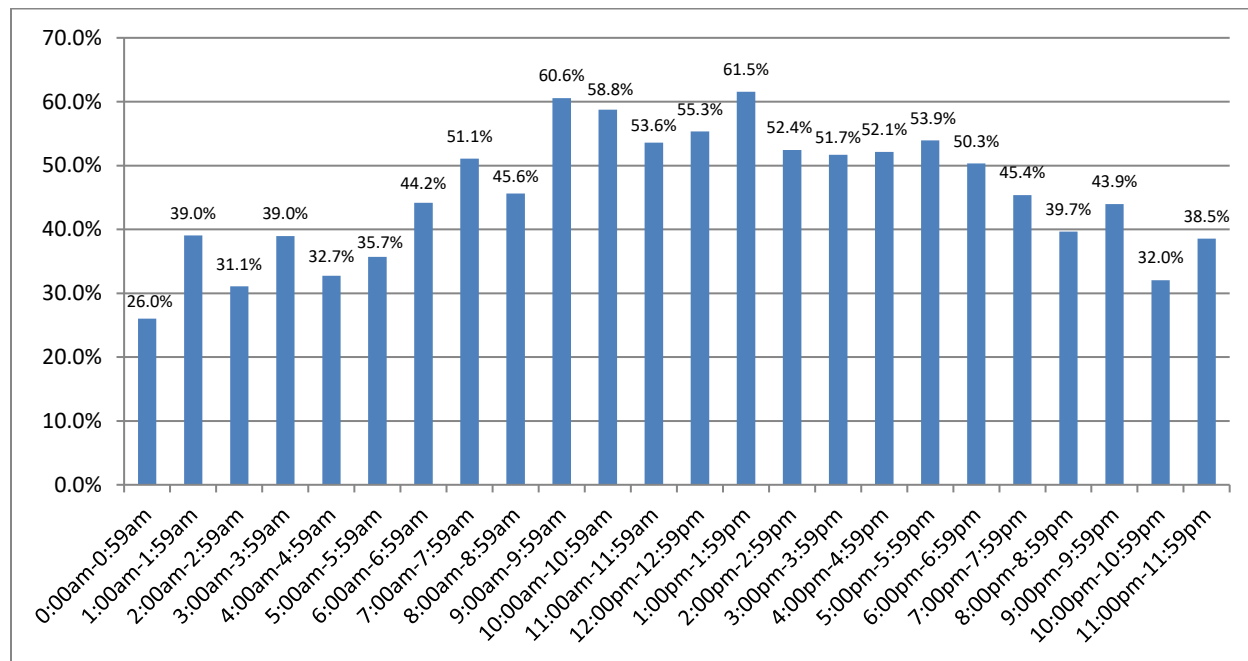


Figure 1: Percent of Louisiana Fatalities Wearing a Seat Belt by Hour; Passenger Vehicle Deaths 2014-2018

Preusser Research Group (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 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 in 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.

<sup>1</sup> (23% in 2018 according to a FARS query by crash hour, though this rate has been higher in the recent past – last reported as 28% in 2015).

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## METHODOLOGY

### Nighttime Survey Site Selection

In 2017, forty nighttime observation sites were randomly selected from the list of resampled observation sites used in Louisiana's 2017 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. Initially, 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 thirty 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.

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 same 40 sites observed for the 2017 survey were measured again for subsequent iterations.

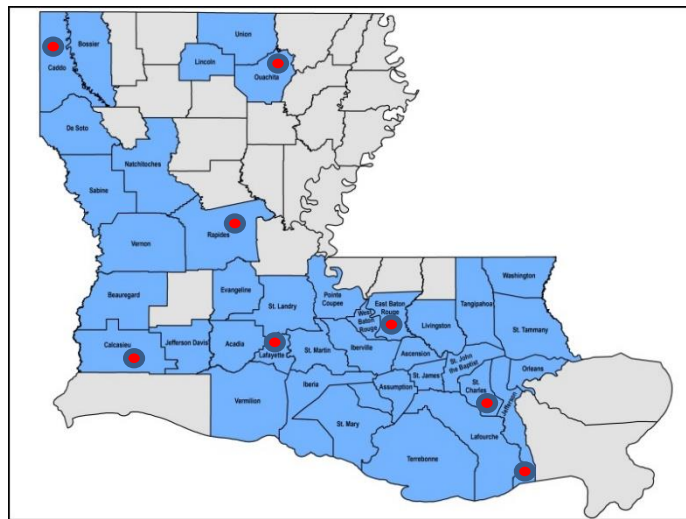


Figure 2: Parishes included in the Nighttime Survey

### Nighttime Survey Scheduling

PRG assigned a single survey team to each parish. The survey team completed observations in the parish in a single night. Teams were assigned one parish each (25% of the total sites) for Friday night measurements, to have both weeknight and weekend nights fairly represented. The six other parishes were observed over Monday, Tuesday, and Wednesday 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.

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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, and the 2019 survey utilized the same site locations and schedule ultimately used for the 2017 and 2018 night measures.

### **Nighttime Survey Observers**

PRG used two trained observers and two trained data recorders. All four surveyors had conducted previous night survey observations for Louisiana, and all returned to their same parishes for the 2019 survey. All had previous experience conducting seat belt observations, including work on substantial parts of past and present Louisiana daytime surveys. Additionally, all surveyors have had extensive experience observing at night and utilizing night vision technology when necessary.



Night Vision Goggles

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.



Infrared Spotlight

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

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### **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 25<sup>th</sup> and 29<sup>th</sup>, 2019. PRG observed daytime seat belt use at the same 40 sites between May 29<sup>th</sup> and June 14<sup>th</sup>, 2019. 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 Observed	Passengers Observed	Total Occupants Observed
<b>Jefferson</b>			
Nighttime	505	118	623
Daytime	1,270	368	1,638
<b>East Baton Rouge</b>			
Nighttime	302	70	380
Daytime	729	180	909
<b>St. Charles</b>			
Nighttime	387	121	508
Daytime	1,310	345	1,655
<b>Lafayette</b>			
Nighttime	199	41	240
Daytime	732	135	867
<b>Calcasieu</b>			
Nighttime	268	86	354
Daytime	778	166	944
<b>Rapides</b>			
Nighttime	173	54	227
Daytime	1,160	252	1,412
<b>Caddo</b>			
Nighttime	659	143	802
Daytime	1,036	261	1,297
<b>Ouachita</b>			
Nighttime	450	122	572
Daytime	505	110	615
<b>Night Total</b>	<b>2,943</b>	<b>755</b>	<b>3,698</b>
<b>Day Total</b>	<b>7,520</b>	<b>1,817</b>	<b>9,337</b>



PRG recorded data on 3,698 front seat occupants (2,943 drivers and 755 passengers) at night. The number of occupants observed ranged from 227 (Rapides Parish) to 802 (Caddo Parish). The number of drivers ranged from 173 (Rapides Parish) to 659 (Caddo Parish) and the number of passengers ranged from 41 (Lafayette Parish) to 143 (Caddo Parish).

PRG recorded data on 9,337 front seat occupants (7,520 drivers and 1,817 passengers) across same the 40 sites at daytime. The number of occupants observed ranged from 615 (Ouachita Parish) to 1,655 (St. Charles Parish). The number of drivers ranged from 505 (Ouachita Parish) to 1,310 (St. Charles Parish) and the number of passengers ranged from 110 (Ouachita Parish) to 368 (Jefferson Parish).

Table 2 displays nighttime and daytime sample characteristics. Notable similarities between the nighttime and daytime samples include similar distributions of males observed on the road compared to females (slightly more than half of the occupants were males), a similar percentage of Hispanic and Other occupants, and a higher ratio of occupants observed on state roads than on interstate ramps (just over 2 to 1). Differences between the night and day samples included a greater proportion of passengers observed at nighttime than at daytime (23% vs. 19%), a decrease in the proportion of White occupants observed (61% vs. 67%) and an increase in Black occupants observed (32% vs. 27%), a smaller percentage of pickup trucks observed at nighttime than at daytime (20% vs. 25%), and a greater proportion of passenger cars observed at nighttime compared to daytime (50% vs. 41%).

TABLE 2.  
Sample Characteristics across 40 Survey Sites\*

	Nighttime Survey % (n)	Daytime Survey % (n)
<b>Occupant Type</b>		
Driver	77% (2,943)	81% (7,520)
Passenger	23% (755)	19% (1,817)
<b>Gender</b>		
Male	56% (2,053)	53% (4,977)
Female	44% (1,641)	47% (4,356)
<b>Race</b>		
White	61% (2,203)	67% (6,256)
Black	32% (1,158)	27% (2,536)
Hispanic	4% (144)	4% (357)
Other	3% (127)	2% (182)
<b>Vehicle Type</b>		
Pickup Truck	20% (723)	25% (2,330)
Passenger Car	50% (1,838)	41% (3,794)
SUV	27% (1,011)	29% (2,715)
Van	3% (126)	5% (498)
<b>Road Type</b>		
Interstate Ramp	30% (1,099)	33% (3,038)
State Road	70% (2,599)	67% (6,299)

\*for known belt use occupants

Table 3 and Figure 3 display overall nighttime and daytime survey results. The November 2019 nighttime seat belt observations indicated an 84.6 percent use rate, based on raw data counts. The May/June 2019 daytime use rate on the same roadways, also based on raw data counts, was 88.8 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 86.4 percent. Weighting the daytime survey data (1:1) resulted in an 89.1 percent use rate across these same observation sites during daylight hours.

TABLE 3.  
2019 Seat Belt Use Rate at Nighttime and Daytime<sup>1</sup>

	Night	Day
<b>Use Rate – Raw Counts</b>	84.6% (3,698)	88.8% (9,337)
<b>Use Rate – (Averaged 1:1)</b>	86.4%	89.1%

<sup>1</sup> Data collected at 40 observation sites; not representative of statewide.

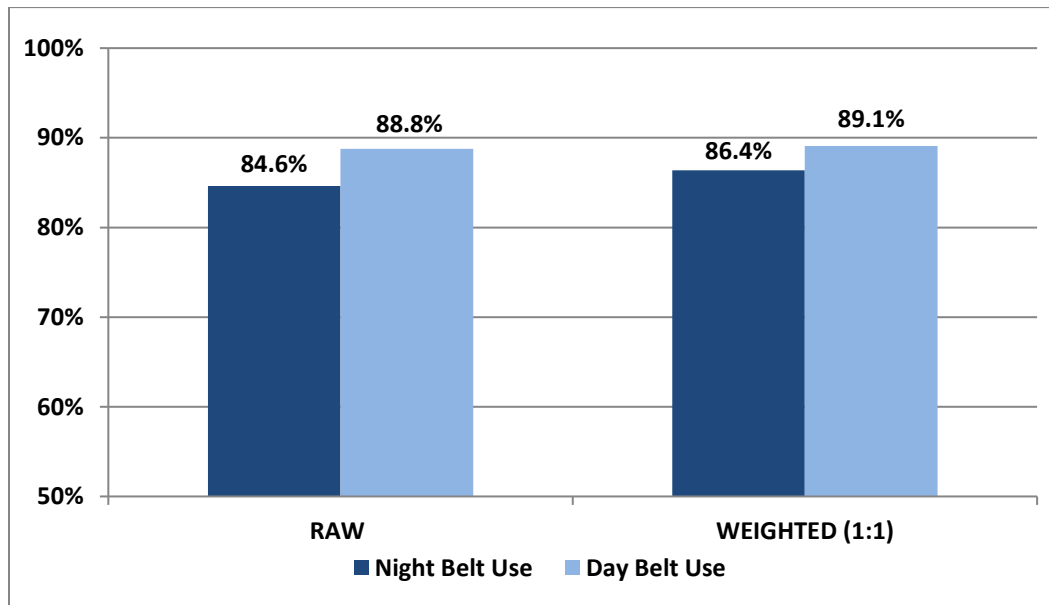


Figure 3: Seat Belt Use at Night & Day across 40 Observation Sites in Louisiana

Figure 4, on the following page, represents a three-year average (2017-2019) of seat belt use rates at night and at day by parish. Due to low volume and seasonal differences in yearly measures, we feel 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 six of the eight parishes. The difference between night and day use was least in St. Charles Parish (where nighttime usage measure highest on average) and greatest in Ouachita Parish (where nighttime usage measured lowest on average).

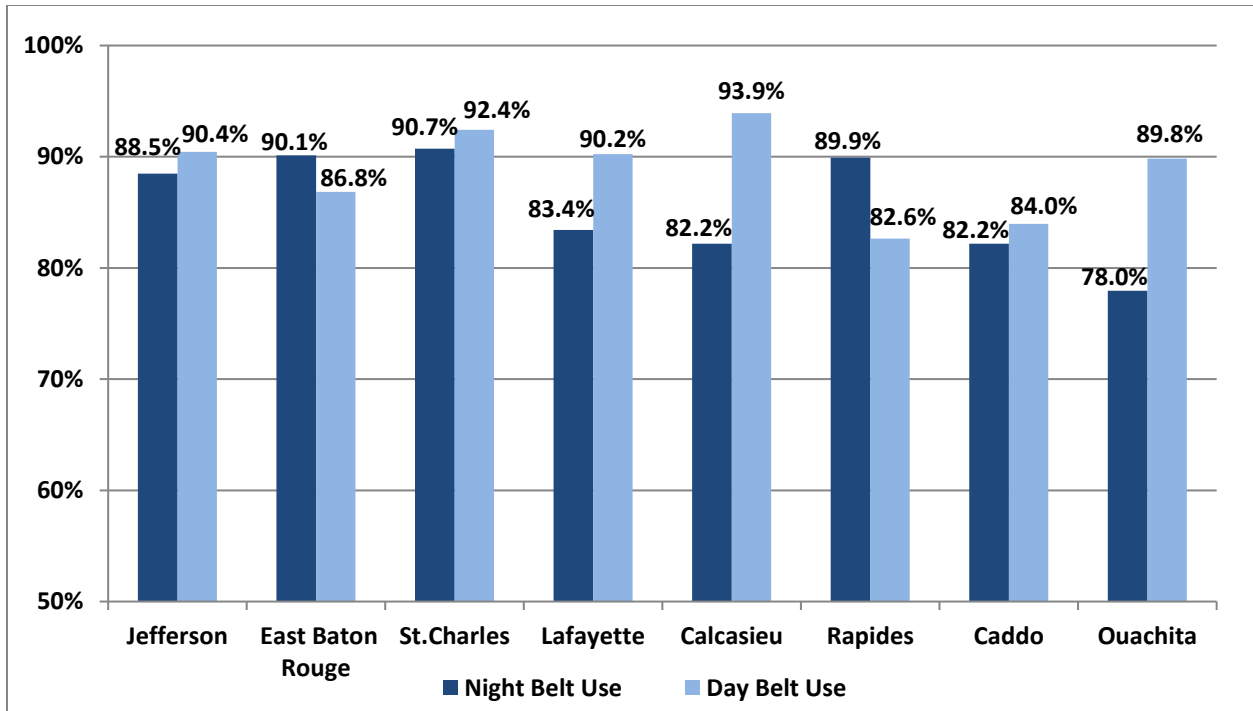


Figure 4: Difference in Seat Belt Use at Night & Day by Survey Parish (3 Year Average)

Female occupants wear their seat belts more often than male occupants and that was true both at night and day (Figure 5), though their gap in usage is more evident at night. Belt usage at nighttime was lower for both sexes with a greater disparity among male occupants (5.5 percentage points) than for the female occupants (2.3 percentage points).

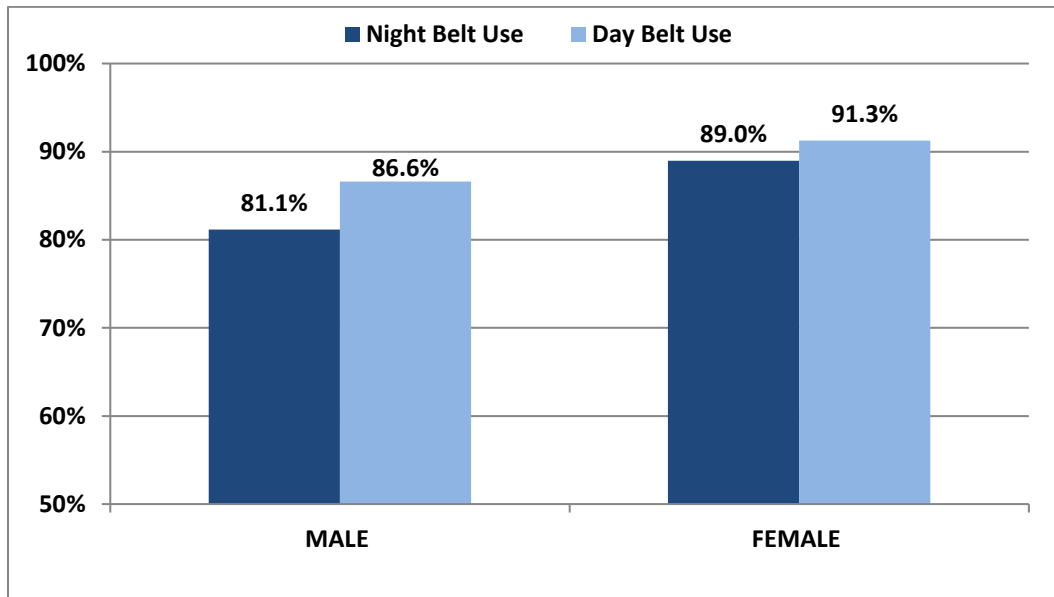


Figure 5: Difference in Seat Belt Use at Night & Day by Occupant Sex

Figure 6 shows driver and passenger belt use rates separately at nighttime and at daytime. While driver belt use at night was clearly lower than driver use at daytime (83.1% vs. 88.4%), front seat passenger use was higher at night versus day (90.5% vs. 90.1%). Of the night drivers where sex was known, 60 percent of them were male. Conversely, females made up most of night passengers (also 60%). Since females have higher belt usage levels than males, this could help explain the higher passenger use levels at night.

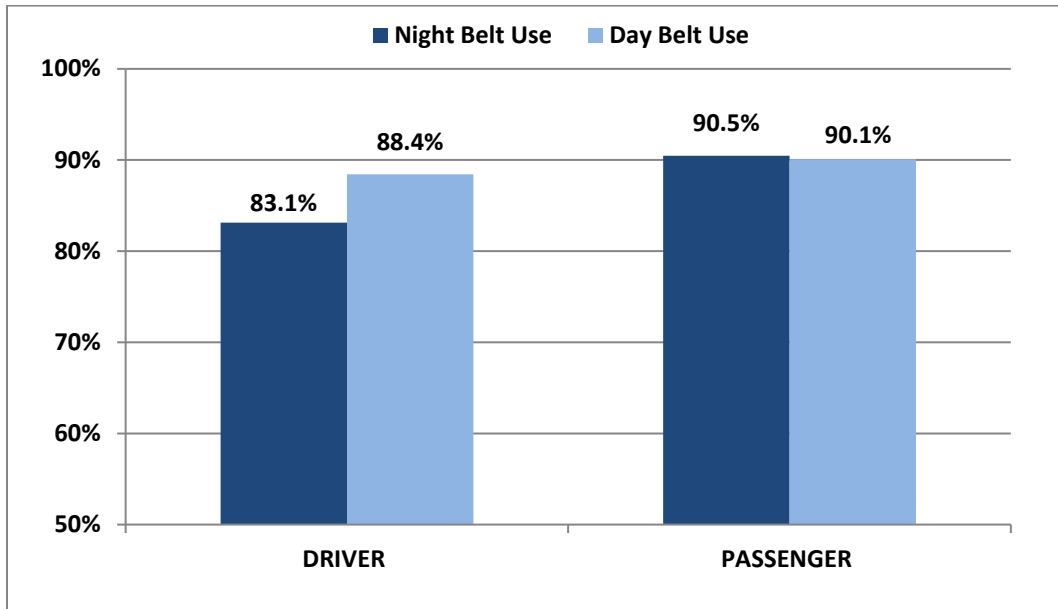


Figure 6: Difference in Seat Belt Use at Night & Day by Occupant Type

Breakdowns by race and ethnicity suggest that while all tend to wear belts less at night, Hispanics and Blacks had the highest usage differentials (Figure 7). Survey data from these locations also indicate that Black occupants used seat belts least often during both nighttime and daytime.

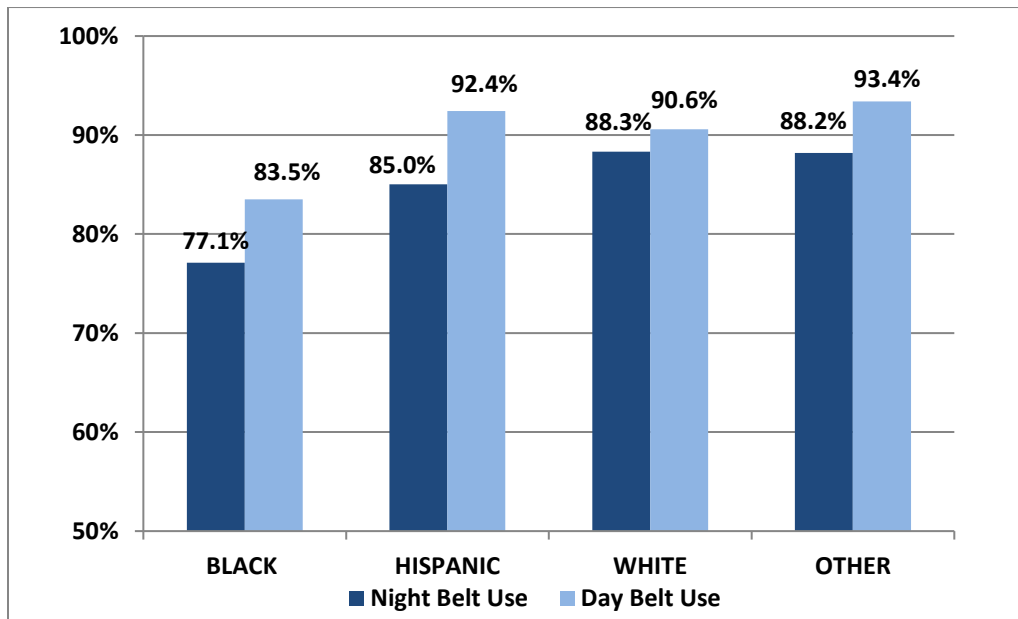


Figure 7: Difference in Seat Belt Use at Night & Day by Occupant Race/Ethnicity

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 (82.0%).

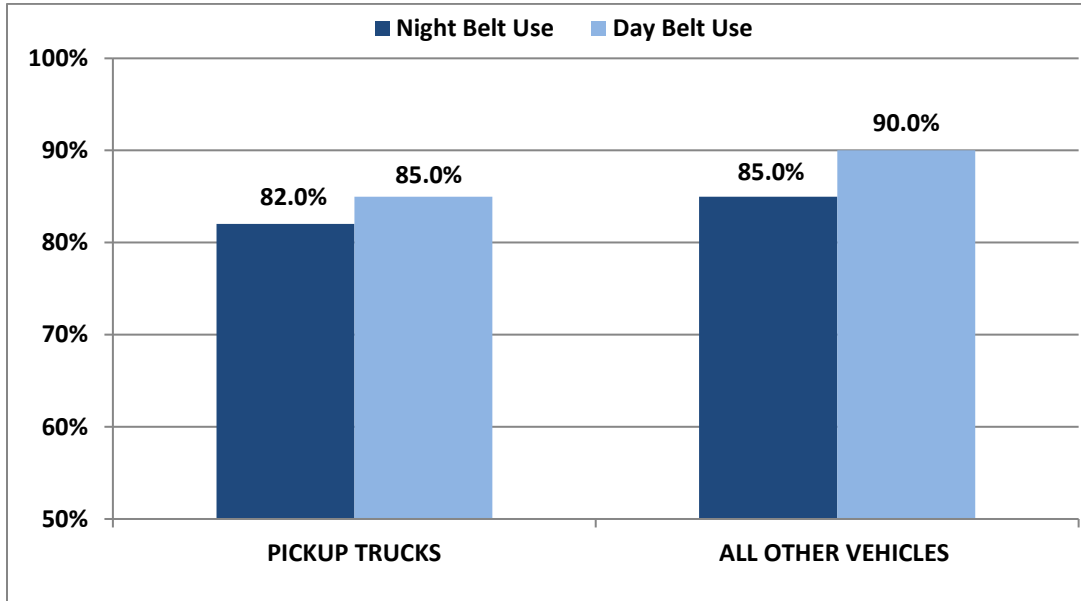


Figure 8: Difference in Seat Belt Use at Night & Day for Occupants in Pickup Trucks

Seat belt use measured lower at night than at day on both roadway types used in the nighttime survey (Figure 9), with greater differential in usage for occupants travelling on state routes (5.0 percentage points vs. 2.0 percentage points on interstates).

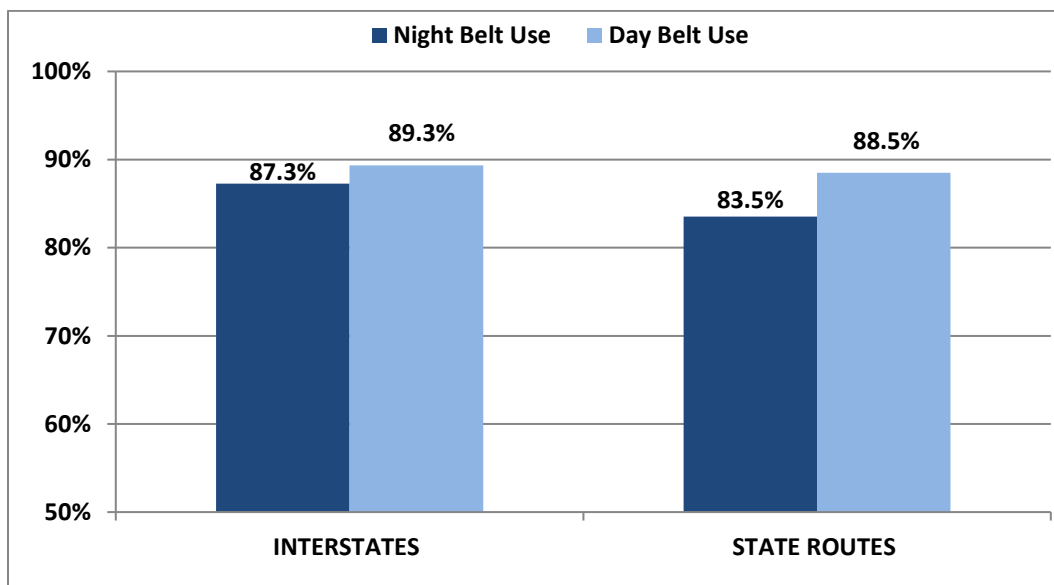


Figure 9: Difference in Seat Belt Use at Night & Day by Road Type

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## CONCLUSION

While the 2019 Nighttime Seat Belt Survey provided some evidence that seat belts are worn less often at night than day on Louisiana roadways, there is also evidence that the usage gap is closing (Figure 10).

The first nighttime observational survey in Louisiana was conducted in November of 2012. Since then, surveys have been conducted in November 2013, May/June 2015, September 2017, August 2018, and back again in November for 2019. 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, though potential seasonal effects should be taken into consideration when interpreting these measurements.

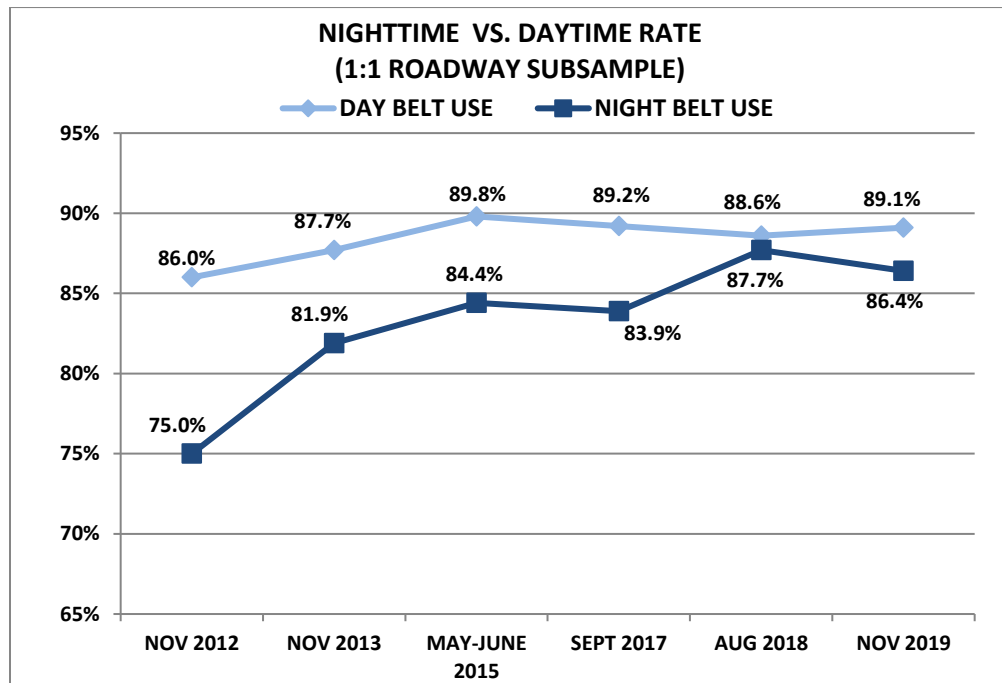


Figure 10: 2012-2019 1:1 Weighted Subsample of Seat Belt Use Rate at Night & Day

Patterns in seat belt use normally seen at daytime were evident at nighttime as well. That is, 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 wore seat belts less than occupants of other races or ethnicities.

It is apparent from recent survey results that some resources have been allocated to address the nighttime usage issue. However, results from this and previous observational surveys of nighttime seat belt use at night still indicate lower usage compared to daytime, particularly among certain subgroups. Past and present results should be used to educate highway safety practitioners to the ongoing problem of lower seat belt use at nighttime and provide motivation to continue to address the matter.

**APPENDIX A: OBSERVATION FORM**

## 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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**Seat Belt Observation Data Form (back)**

**Location:** \_\_\_\_\_  
(Street) (Cross Street or other landmark)

**Site #:** \_\_\_\_\_

**Notes:**  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Diagram:**

