2017 LOUISIANA NIGHTTIME

ADULT SEAT BELT OBSERVATION SURVEY RESULTS

-FINAL REPORT-

LHSC Project No. 2017-20-10

STATE OF LOUISIANA

John Bel Edwards, Governor

September 30, 2017

Prepared for:

LOUISIANA HIGHWAY SAFETY COMMISSION
Dr. Katara Williams, Executive Director
Post Office Box 66336
Baton Rouge, LA 70896

Prepared by:

PREUSSER RESEARCH GROUP, INC.
7100 Main Street
Trumbull, CT 06611
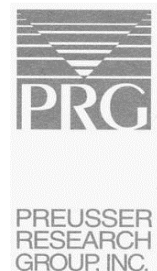
TABLE OF CONTENTS

INTRODUCTION

Over one-quarter (28%) 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 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 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 41 percent (in 2015; *Source: Louisiana Highway Safety Program Annual Report 2016*), but from the hours of 7 P.M. through 7 A.M., belt usage is lower than average (Figure 1).
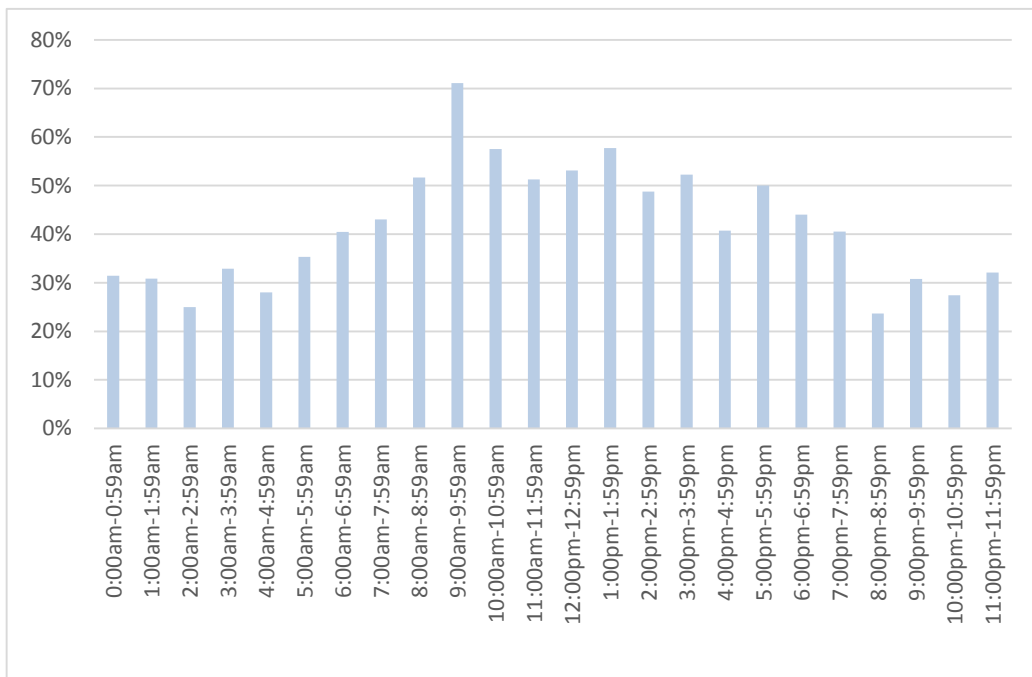

Figure 1: Percent of Louisiana Fatalities Wearing a Seat Belt by Hour;
Passenger Vehicle Deaths 2011-2015

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, it was decided that approximately a 10 percent sample of the sites visited for the daytime survey would be used 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.

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.
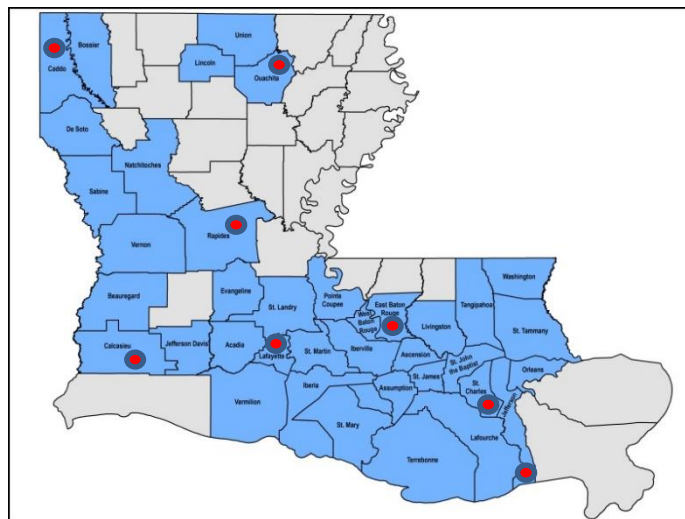

Figure 2: Parishes included In the Nighttime Survey

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 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.

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

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.

Night Vision Goggles

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.

Infrared Spot Light

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, 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 use for the passing vehicles.

Building a Data Set

Observation data were keypunched by Preusser Research Group, Inc. 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 September 5th and 8th, 2017. PRG observed daytime seat belt use at the same 40 sites between May 30th and June 16th, 2017. 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
Jefferson			
Nighttime	494	101	595
Daytime	1,338	391	1,729
East Baton Rouge			
Nighttime	255	34	289
Daytime	993	272	1,265
St. Charles			
Nighttime	371	106	477
Daytime	1,413	353	1,766
Lafayette			
Nighttime	416	109	525
Daytime	689	151	840
Calcasieu			
Nighttime	287	80	367
Daytime	792	191	983
Rapides			
Nighttime	133	29	162
Daytime	968	239	1,207
Caddo			
Nighttime	497	95	592
Daytime	869	257	1,126
Ouachita			
Nighttime	159	20	179
Daytime	804	226	1,030
Night Total	**2,612**	**574**	**3,186**
Day Total	**7,866**	**2,080**	**9,946**

PRG recorded data on 3,186 front seat occupants (2,612 drivers and 574 passengers) at night. The number of occupants observed ranged from 162 (Rapides Parish) to 595 (Jefferson Parish). The number of drivers ranged from 133 (Rapides Parish) to 497 (Caddo Parish) and the number of passengers ranged from 20 (Ouachita Parish) to 109 (Lafayette Parish).

PRG recorded data on 9,946 front seat occupants (7,866 drivers and 2,080 passengers) across the same 40 sites at daytime. The number of occupants observed ranged from 840 (Lafayette Parish) to 1,766 (St. Charles Parish). The number of drivers ranged from 689 (Lafayette Parish) to 1,413 (St. Charles Parish) and the number of passengers ranged from 151 (Lafayette Parish) to 391 (Jefferson 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, a higher percentage of white occupants versus non-white, 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 males observed at nighttime than at daytime (58% vs. 53%); an increase in the proportion of Black occupants observed (33% vs. 28%); a smaller percentage of pickup trucks observed at nighttime than at daytime (21% vs. 26%); and a greater proportion of passenger cars observed at nighttime compared to daytime (47% vs. 40%).

TABLE 2.
Sample Characteristics across 40 Survey Sites*

	Nighttime Survey % (n)	Daytime Survey % (n)
Occupant Type		
Driver	82% (2,612)	79% (7,866)
Passenger	18% (574)	21% (2,080)
Gender		
Male	58% (1,855)	53% (5,253)
Female	42% (1,329)	47% (4,669)
Race		
White	60% (1,896)	68% (6,718)
Black	33% (1,058)	28% (2,805)
Hispanic	4% (113)	3% (262)
Other	4% (112)	1% (140)
Vehicle Type		
Pickup Truck	21% (654)	26% (2,564)
Passenger Car	47% (1,490)	40% (3,945)
SUV	28% (900)	30% (2,941)
Van	4% (142)	5% (496)
Road Type		
Interstate Ramp	31% (973)	33% (3,262)
State Road	69% (2,213)	67% (6,684)

*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 percent use rate, based on raw data counts. The daytime use rate, also based on raw data counts, was 89.1 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. Equally weighting the sites (1:1) estimated the nighttime use rate at 83.9 percent. Weighting the daytime survey data (1:1) indicated an 89.2 percent use rate across these same observation sites during daylight hours.

TABLE 3.

2017 Seat Belt Use Rate at Nighttime and Daytime[1]

	Night	Day
Use Rate – Raw Counts	85.0% (3,186)	89.1% (9,946)
Use Rate – (Averaged 1:1)	83.9%	89.2%

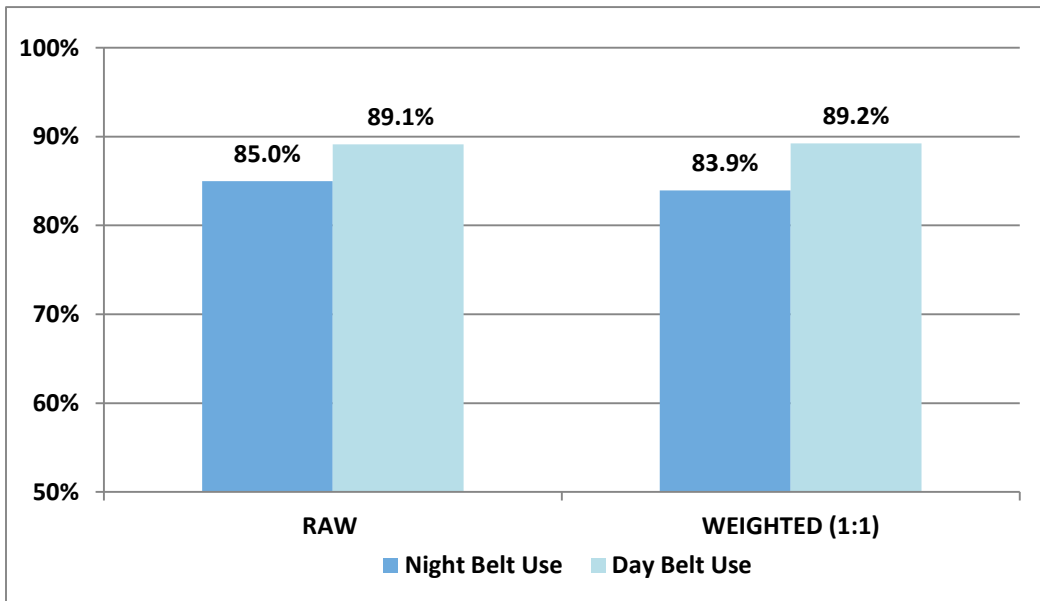[1] Data collected at 40 observation sites; not representative of statewide.

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

Figure 4 shows seat belt use rates at night and at day by Parish (raw data). Data in Figure 4 do not represent Parish-wide use rates. PRG did not design the nighttime survey to give Parish-wide use rates, and in some Parishes the sample size was very small. The 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 Jefferson Parish (1.9 percentage points) and greatest in Ouachita Parish (16.6 percentage points).
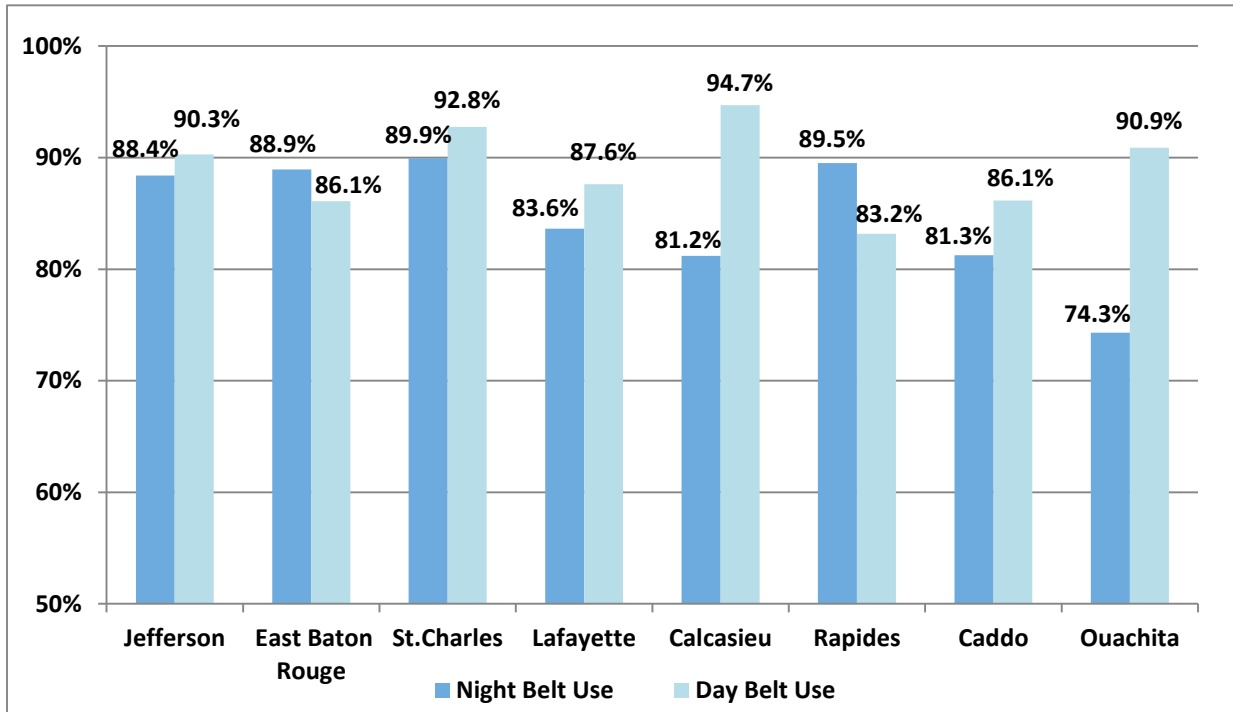
Figure 4: Difference in Seat Belt Use at Night & Day by Survey Parish

Figure 5 shows driver and passenger belt use rates separately at nighttime and at daytime. While driver belt use at nighttime was clearly lower than driver use at daytime (85.2% vs. 89.0%), front seat passengers measured a larger gap in belt usage at night versus day (84.1% vs. 89.8%). Passenger belt use measured higher than driver use during the day, where females make up 63 percent of the daytime passenger sample. The reverse was true at night when driver belt use was higher than passenger use. Most night drivers were male (61%), and males made up nearly half of the nighttime passenger sample (45%).
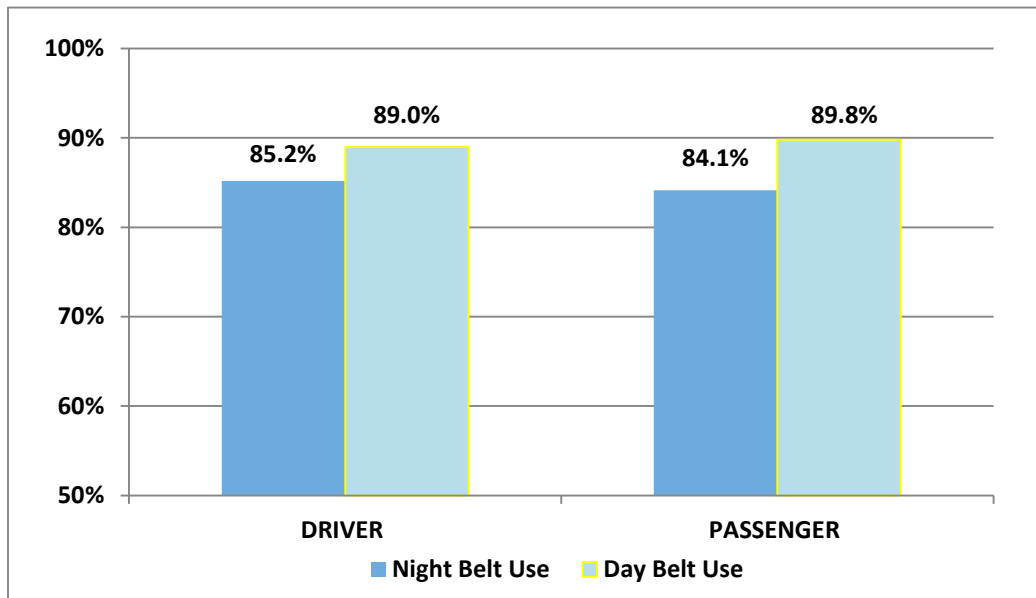

Figure 5: Difference in Seat Belt Use at Night & Day by Occupant Type

As indicated above, female occupants wear their seat belt more often than male occupants and that was true both at night and day (Figure 6). Belt usage at nighttime was lower for both genders with a greater disparity among male occupants (4.7 percentage points) than for the female occupants (2.8 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 from these locations indicated that Black occupants used seat belts least often during both nighttime and daytime.
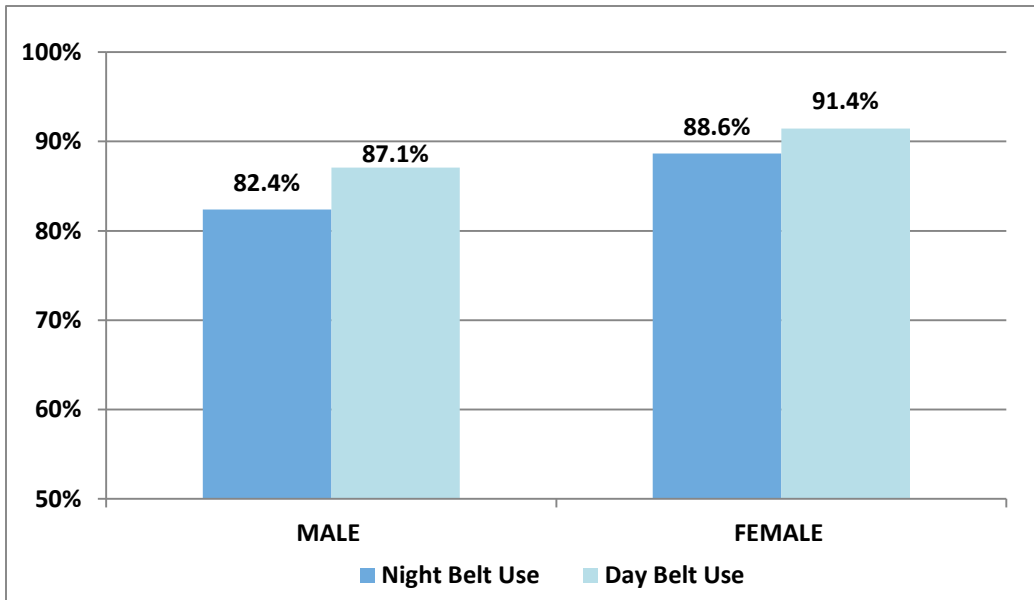

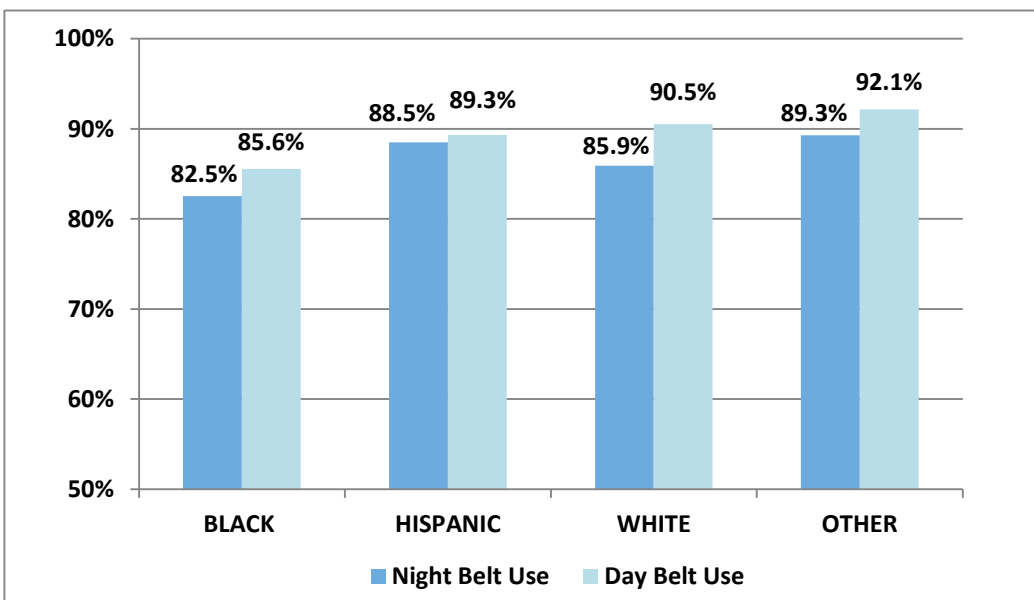Figure 6: Difference in Seat Belt Use at Night & Day by Occupant Gender

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 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 at nighttime (77.4%).
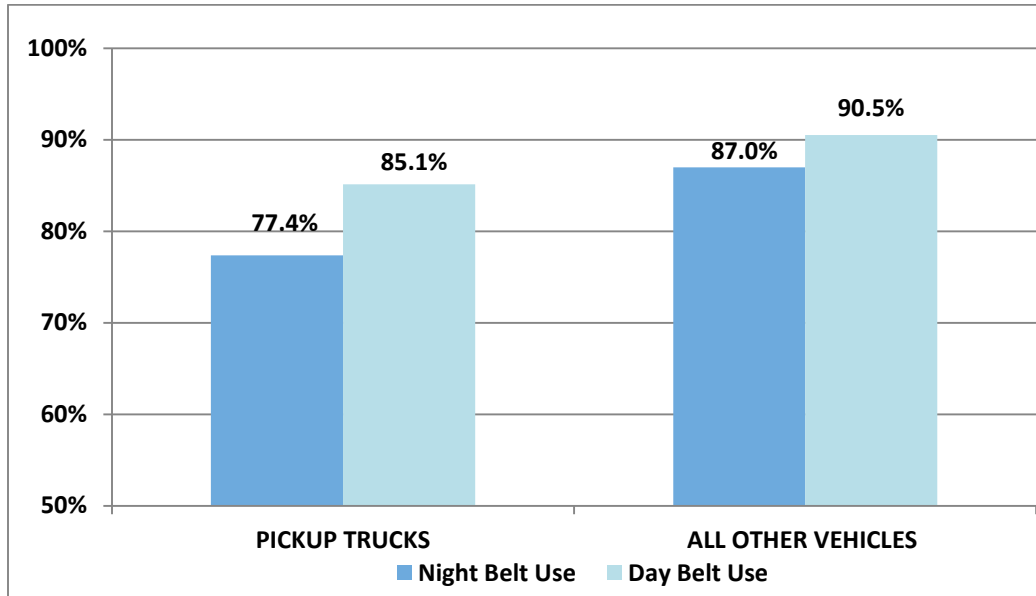

Figure 8: Difference in Seat Belt Use at Night & Day for Occupants in Pickup Trucks

Seat belt use measured lower at night than at day on both roadway types used in the nighttime survey (Figure 9), with more or less the same differential in usage (4.2 vs. 4.1 percentage points on Interstates vs. State Routes).
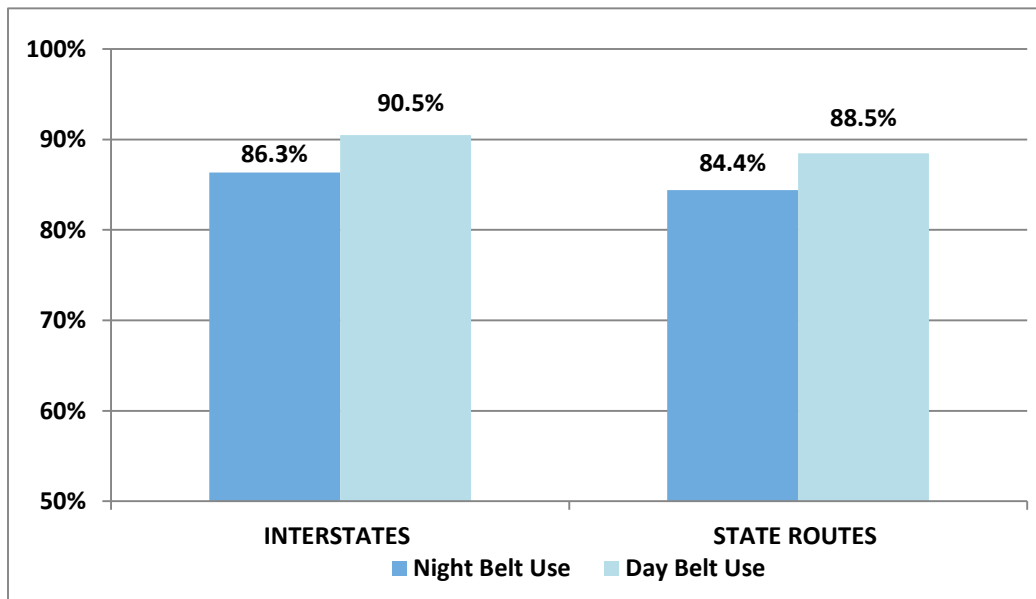

Figure 9: Difference in Seat Belt Use at Night & Day by Road Type

CONCLUSION

The 2017 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 six 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 evident at nighttime. 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.

The first nighttime observational survey in Louisiana was conducted in November of 2012 (Figure 10). Since then, surveys have been conducted in November 2013, May/June 2015, and September 2017. 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 used in the September 2017 survey. The new sites used in 2017 were selected as a sub-sample of sites from the newest statewide daytime survey design (NHTSA compliant survey) and the results generally pick up where 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.
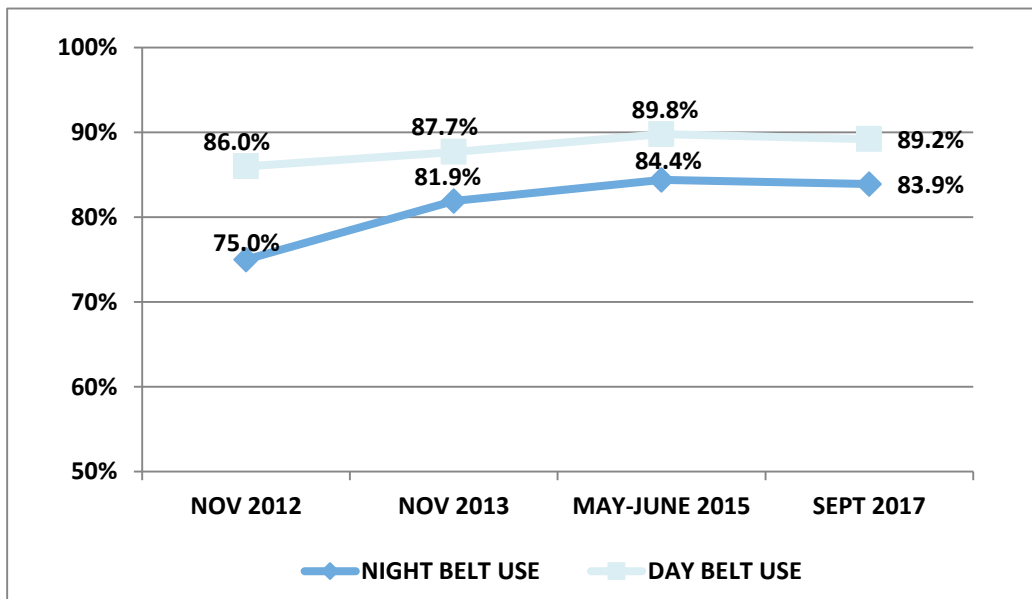

Figure 10: 2012-2017 1:1 Weighted Subsample of Seat Belt Use Rate at Night & Day

Results from the observational surveys of seat belt use at night should be used to educate highway safety practitioners to the problem of lower seat belt use at nighttime, as well as provide motivation to address the issue.

Appendix A

Seat Belt/Helmet Use Observation Data Form

SITE NUMBER:_____   SITE:_____   OBSERVER INITIALS:_____

DIRECTION OF TRAFFIC FLOW: N   S   E   W

CHECK ONE: _____DAYTIME   _____NIGHTTME

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. #	**Veh. Type** C=Car T=Truck S=SUV V=Van M=Motorcycle	**Sex** M=Male F=Female U=Unsure	**Race** W=White B=Black H=Hispanic O=Other U=Unsure	**Belt/ Helmet Use** Y = Yes N = No U=Unsure	**Sex** M=Male F=Female U=Unsure	**Race** W=White B=Black H=Hispanic O=Other U=Unsure	**Belt/ Helmet Use** Y = Yes N = No U=Unsure
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							

Pg:_____ of _____

A-1

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

Site #: _____

Notes: _____

_____

_____

Diagram: