

2019 LOUISIANA CHILD RESTRAINT OBSERVATION SURVEY RESULTS
LHSC Project No. 2019-20-10



Prepared for:

LOUISIANA HIGHWAY SAFETY COMMISSION

Lisa Freeman, Executive Director

Post Office Box 66336
Baton Rouge, LA 70896

Prepared by:

DR. HELMUT SCHNEIDER

Louisiana State University, ISDS Department
Baton Rouge, LA 70803

PREUSSER RESEARCH GROUP, INC.

7100 Main Street
Trumbull, CT 06611

This document 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 2019-20-10.

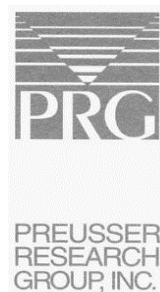


TABLE OF CONTENTS

Contents

INTRODUCTION	1
BACKGROUND	1
LOUISIANA CHILD PASSENGER LAWS.....	1
TYPES OF RESTRAINT.....	1
2019 CHILD RESTRAINT SURVEY	1
METHODOLOGY	2
Observation Site Selection	2
Scheduling.....	2
Data Collection Protocol and Procedures.....	2
FINDINGS.....	4
Usage by Age Category	4
Usage by Region.....	7
Usage by Louisiana State Police Troop Area.....	8
Front Versus Back Seat Usage.....	9
Trends in Child Restraint Usage	10
Characteristics of Drivers with Children	13
Driver Belt Use	13
How is Driver Belt Use Related to Child Restraint Use?	13
CONCLUSIONS.....	17
APPENDIX A. CHILD RESTRAINT SURVEY DATA COLLECTION FORM.....	AError! Bookmark not defined.

INTRODUCTION

Background

Research has shown that child safety seats reduce fatal injury by 71 percent for infants (under 1-year old) and by 54 percent for toddlers (1 to 4 years old) in passenger cars. The corresponding reductions in light trucks are 58 percent and 59 percent respectively. Among children under 5 years old, an estimated 252 lives were saved nationwide in 2014 by restraint use (NHTSA, 2014). Older children and adults are far more likely to survive a severe crash with less injury when wearing a safety belt (NHTSA, 2017).

Louisiana Child Passenger Laws

Louisiana law (R.S. 32:295) states that children under the age of 6 years or less than 60 pounds must be in a child restraint system or booster seat that is age and size appropriate, in accordance with manufacturers recommendations. Children 6-12 years of age must be restrained by a lap belt, shoulder harness, or an age / size appropriate child safety or booster seat.

Types of Restraint

Child safety experts recommend that children aged 12 and under should ride properly buckled in the back seat. Airbags can kill young children riding in the front seat. Never place a rear-facing car seat in the front seat or in front of an airbag.

Type of restraint is determined based on age, weight, and height of the child. The device manufacturer provides directions that should be followed. Car seat inspection stations are located throughout Louisiana. Information on types of restraint and certified technicians who can help answer questions on proper seats and correct installation can be located at the Louisiana Highway Safety Commission web portal:

<http://www.lahighwaysafety.org/Pages/OurPrograms/ChildPassengerSafety.aspx> .

2019 Child Restraint Survey

Preusser Research Group, Inc. (PRG), under contract with the Louisiana Highway Safety Commission (LHSC), conducted an observational survey in May 2019 to determine child restraint use rates across the State of Louisiana. The LHSC sponsored this survey to determine compliance with the state's Child Passenger Safety Law.

The 2019 Child Restraint Survey in Louisiana followed a design prepared by Dr. Helmut Schneider. Dr. Schneider is the Ourso Family Distinguished Professor of Information Systems at Louisiana State University, Baton Rouge, Louisiana. The Schneider design provided for data collection at specified locations throughout eight regions comprising the State of Louisiana.

The 2019 survey was the 32nd child restraint usage survey (statewide survey) conducted in Louisiana. This was the fourth year Preusser Research Group was responsible for the observational data collection. The findings from the 2019 survey are presented in this report.

METHODOLOGY

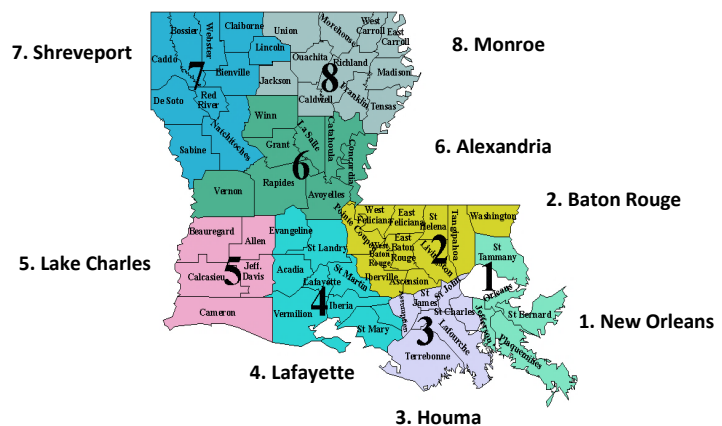
Observation Site Selection

Observations took place at the same 69 site locations used since year 2011. These locations were spread among 8 regions (Figure 1) to provide statewide representation.

PRG provided each observer a site location list and a schedule that included the day of week and times of day to observe. PRG observers used site maps made by previous observers in 2013 in order to replicate the location to stand while observing and the flow of traffic to observe at each site. The same observers from 2018 went to their same locations for 2019.

PRG data collectors observed from locations at or near traffic control devices or entrances/exits of businesses. In some cases, more than one lane of traffic and direction of travel was observed. PRG instructed observers to carefully position themselves to allow for a safe and unobstructed view inside vehicles while not disturbing the flow of passing traffic.

FIGURE 1: LOUISIANA SURVEY REGIONS



Scheduling

Observations took place on the same days of week and times of day as in previous survey efforts. The Louisiana Child Restraint survey was conducted by Applied Technology prior to 2013. PRG discussed details of scheduling with Applied Technology to help develop the 2013 observation schedule and observational protocol in order to closely replicate prior surveys. The 2019 survey was completed using the same survey schedule developed and used in 2013, 2014, 2015, 2017 and 2018.

Data Collection Protocol and Procedures





Each observation period lasted one hour (60 minutes). Observers wore reflective safety vests at all times during data collection activities. Each observer also carried a letter of identification stating that the Louisiana Highway Safety Commission commissioned the survey. The letter indicated the purpose of the survey and provided details about the survey dates and times.

Observers determined a child occupant's approximate age, placement in the vehicle (including seat position), and use of a safety restraint device. Observers were provided an explanation of the current child passenger safety law (Table 1) to be knowledgeable under what conditions children are to be restrained in Louisiana. Observers first determined the approximate age group of the child occupant and marked the corresponding age group on the data form (Appendix B). If the child appeared restrained in a device or seat belt, the appropriate box was checked on the data

collection form. If a child appeared unrestrained, observers recorded “No” on the form. If a partial determination was made, the observation was recorded as “Undetermined.”

Multiple children were often observed in a vehicle. When that was the case, restraint use for the youngest child was recorded first, then information for the next youngest child occupant was recorded as time/visibility allowed.

TABLE 1: LOUISIANA CHILD RESTRAINT REQUIREMENTS

Age Group	Ages	Weight	Facing	Restraint Device
Infant	< 1	< 20 pounds	rear-facing	infant seat 
1 - 3	1, 2, 3	20-39 pounds	forward-facing	child safety seat (with internal harness) 
4 - 5	4, 5	40-59 pounds	(not specified)	belt positioning booster seat (backless or high-backed) 
6 - 12	6, 7, 8, 9, 10, 11, 12	60 or more pounds	(not specified)	child booster seat or safety belt 

Child Occupant Seatbelt (R.S. 32:295) - Children under the age of 6 years or less than 60 lbs. must be in a child restraint system or booster seat that is age and size appropriate, in accordance with manufacturers’ recommendations. Children 6 through 12 years of age must be restrained by a lap belt, shoulder harness, or an age / size appropriate child safety or booster seat.

Statistical Analysis

The report provides average use rates and includes standard error of the use rate estimates where appropriate. While the total sample size was large enough to make a reliable judgment about changes in use rates from year to year, when the data are broken down by region and age group, year to year changes must be interpreted with caution. In some cases, the sample size was less than 10 (in one case even as low as 2) making it impossible to draw useful inference about the true mean of the usage rate.

FINDINGS

PRG observers collected the survey data between May 5th and May 18th, 2019. Ultimately, the survey included data on 1,896 children under the age of 13 in 1,687 vehicles. Table 2 displays the number of children observed by age and by region across all 69 observation sites.

TABLE 2: NUMBER OF OBSERVATIONS MADE AND SITES WORKED BY REGION (2019)

Regions	Number of Sites	Total Observations	Age Unk.	Age <1	Age 1 - 3	Age 4 - 5	Age 6 - 12
1. New Orleans vicinity	15	379	0	4	76	112	187
2. Baton Rouge vicinity	10	309	0	0	58	72	179
3. Houma/Thibodaux vicinity	7	239	2	12	66	80	79
4. Lafayette vicinity	10	250	0	29	50	8	163
5. Lake Charles vicinity	5	97	0	9	15	3	70
6. Alexandria vicinity	7	161	2	17	33	13	96
7. Shreveport vicinity	9	307	2	8	65	110	122
8. Monroe vicinity	6	154	0	5	42	61	46
Total	69	1,896	6	84	405	459	942

Usage by Age Category

Table 3 depicts the restraint use by age group and restraint type. Observed restraint type by age category indicates that children, by and large, use the proper restraint type devices when not unrestrained.

TABLE 3: RESTRAINT TYPE/USE BY AGE CATEGORY (2019)

	Age < 1	Unknown	Age <1	Age 1-3	Age 4-5	Age 6-12
Standard Belt	n	1	1	3	106	733
	%	0.1%	0.1%	0.4%	12.6%	86.8%
Rear Facing	n		72	31		
	%	0.0%	69.9%	30.1%	0.0%	0.0%
Front Facing	n		9	304	6	
	%	0.0%	2.8%	95.3%	1.9%	0.0%
High Back Booster	n	1		2	133	8
	%	0.6%	0.0%	1.4%	92.4%	5.6%
Backless Booster	n				48	2
	%	0.0%	0.0%	0.0%	96.0%	4.0%
Not Belted	n	4	2	65	162	193
	%	0.9%	0.5%	15.3%	38.0%	45.3%
Unknown	n				4	6
	%	0.0%	0.0%	0.0%	40.0%	60.0%
Total	n	6	84	405	459	942
	%	0.3%	4.4%	21.4%	24.2%	49.7%

It is important to note that an unobtrusive, observational survey like the one presented here cannot tell if a child is correctly using a child safety seat or booster seat or if the child safety seat or booster seat are correctly installed. There may be cases where booster seat usage is recorded as “seat belted” due to not detecting a backless booster seat. Also, as noted in Table 3, 10 different children had their usage marked as ‘Unknown’ even though the observer documented their age. The following tables and graphs on this page and the next, do not include passenger data in cases where usage was recorded “Undetermined” and present results using unweighted data.

Table 4: RESTRAINT TYPE/USE BY AGE CATEGORY— UNWEIGHTED DATA (2019)






		<u>Age < 1</u> (n=84)	<u>Age 1-3</u> (n=405)	<u>Age 4-5</u> (n=455)	<u>Age 6-12</u> (n=936)
	Rear-Facing Carrier	85.7% (n=72)	7.7% (n=31)	0% (n=0)	0% (n=0)
	Forward-Facing Carrier	10.7% (n=9)	75.1% (n=304)	1.3% (n=6)	0% (n=0)
	Booster Seat	0% (n=0)	0.5% (n=2)	39.4% (n=181)	1.1% (n=10)
	Vehicle Safety Belt	1.2% (n=1)	0.7% (n=3)	23.1% (n=106)	77.8% (n=733)
	No Restraint Used	2.4% (n=2)	16.0% (n=65)	35.3% (n=162)	20.5% (n=193)

FIGURE 2: TOTAL RESTRAINT USAGE BY AGE CATEGORY (2019)

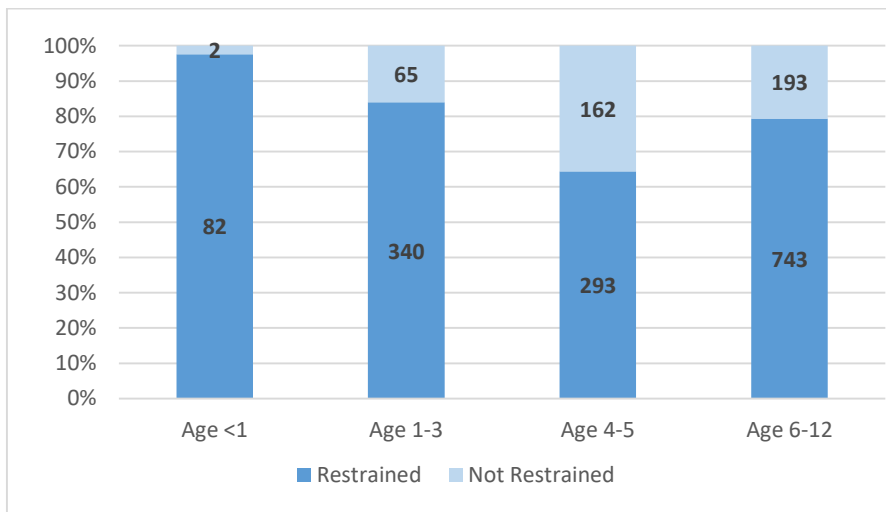
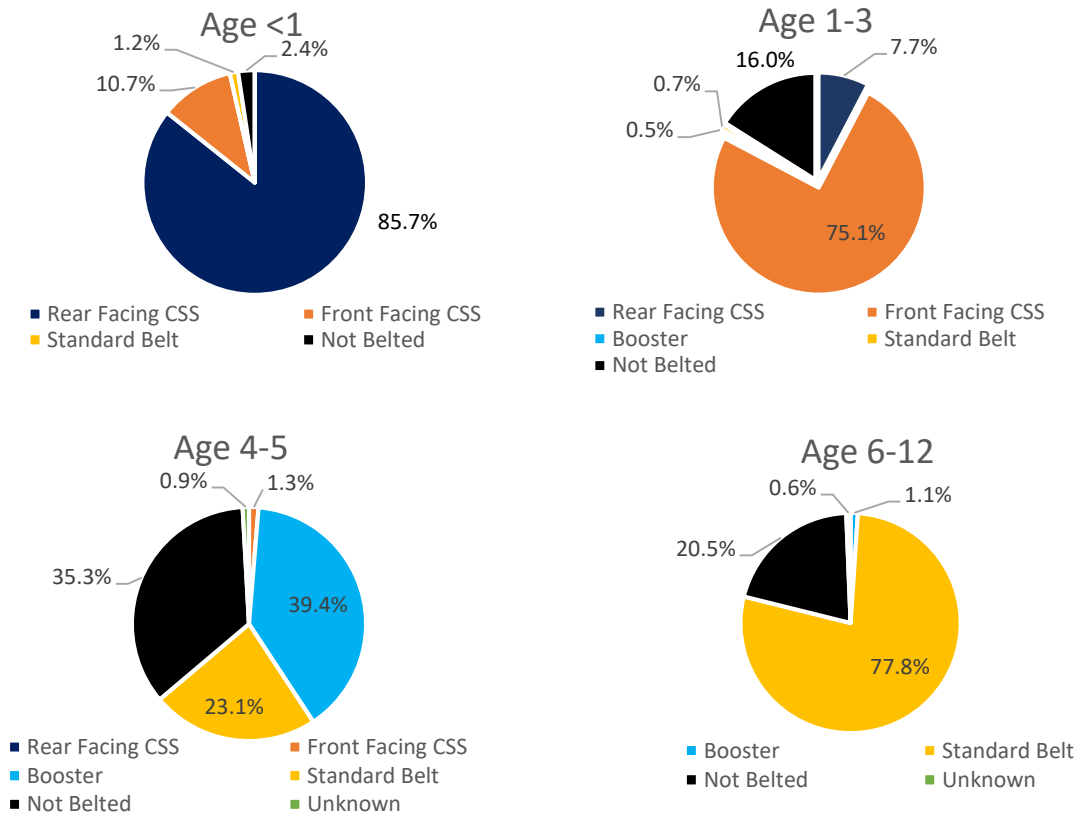


FIGURE 3: RESTRAINT TYPE/USE BY AGE CATEGORY (2019)



Approximately four out of five (79.9%) children included in the survey were restrained (Table 5). The sample error for this estimate was 1.0 percentage point. Survey data indicated that nearly every child less than one-year old was riding in a child safety seat (98.3%). Usage was 100% in all but two Louisiana Regions, i.e., Shreveport and Houma (Table 5). The survey data indicated that 86.9% of children age 1-3 were restrained. Usage among this age group varied across the regions of the State. Among this age group, restraint usage ranged from a low of 72.6% in the Shreveport Region to a high of 100% in the Alexandria Region.

Four and five-year old children were restrained least often (65.8%) compared to both younger and older children (statewide). Survey results by region indicated vast differences between the regions. Survey data indicated the highest observed usage for children ages 4-5 in the New Orleans Region (74.0%) and lowest observed usage in the Lake Charles Region (28.3%). **However, it must be noted that sample sizes by regions and age groups are too small to draw reliable conclusions regarding differences between regions by age group.** The restraint usage rate in Louisiana for children under age six was 80.2% with a standard error of 1.5 percentage points. Survey data also indicated that 79.7% of children ages 6-12 were restrained with a standard error of 1.4 percentage points.

TABLE 5: CHILD RESTRAINT USAGE ESTIMATES (PERCENT RESTRAINED) AND ASSOCIATED SAMPLE ERROR BY REGION AND AGE CATEGORY (2019) — WEIGHTED DATA

Regions	Age < 1	Age 1 - 3	Age 4 - 5	Age 6 - 12	Age <6	Age <13	Error Age <6	Error Age <13
1. New Orleans	100.0%	87.0%	74.0%	88.6%	83.1%	86.7%	3.3%	2.2%
2. Baton Rouge	NA	85.5%	67.4%	66.1%	76.4%	69.4%	3.2%	2.6%
3. Houma/Thibodaux	95.9%	83.5%	66.0%	70.0%	78.8%	73.1%	3.1%	3.3%
4. Lafayette	100.0%	98.4%	66.7%	85.4%	87.5%	86.1%	4.2%	2.7%
5. Lake Charles	100.0%	97.9%	28.3%*	82.1%	73.1%	78.9%	8.2%	4.0%
6. Alexandria	100.0%	100.0%	72.1%	85.9%	91.2%	87.8%	4.1%	2.8%
7. Shreveport	91.2%	72.6%	59.5%	84.8%	71.1%	79.7%	3.8%	2.7%
8. Monroe	100.0%	73.2%	67.6%	65.1%	75.1%	68.6%	3.7%	4.5%
Statewide	98.3%	86.9%	65.8%	79.7%	80.2%	79.9%	1.5%	1.0%
Error	0.7%	1.9%	3.1%	1.4%	1.5%	1.0%		

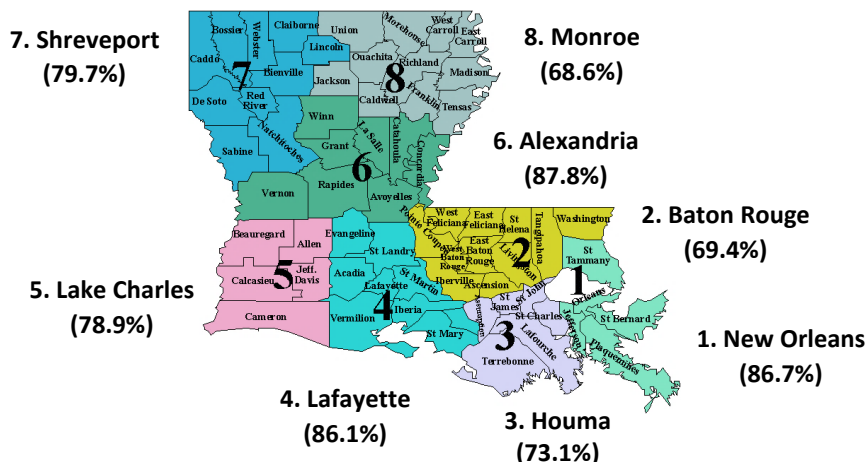
*Region 5 had only three children ages 4-5 and Region 2 had no infants below age 1.

Usage by Region

Figure 4 shows restraint usage for all ages in 2019. The low sample size collected at many sites allows for double digit swings in usage year to year at the local and regional level. Because there are eight regions, using a significant level of 0.05 for individual regions would result in an inflated significance level of 18%. This means that, even if there is no difference in the usage rate for any region between 2018 and 2019, there is an 18% chance of obtaining at least one regional difference statistically significant at the 0.05 level. Therefore, we should reduce the significance level for regional estimates to p=0.01 rather than p=0.05. Only two regions, Baton Rouge (-18 percentage points) and Houma (-13.8 percentage points), had differences for all ages measured that were statistically significant at p=0.01 between 2018 and 2019. For children below the age of six, only the

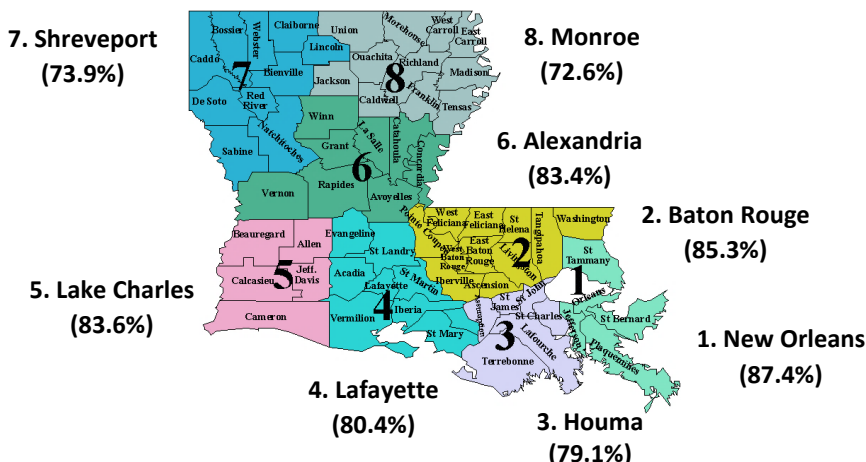
Baton Rouge Region (-14.3 percentage points) had differences measured that were statistically significant at $p=0.01$ between 2018 and 2019. The 2019 usage rate for children ages 12 and younger was highest in the Alexandria Region (87.8%) followed by the New Orleans Region (86.7%) and the Lafayette Region (86.1%). In comparison, child restraint usage rate was lower in the Monroe Region (68.6%), Baton Rouge Region (69.4%) and Houma Region (73.1%).

FIGURE 4: 2019 CHILD RESTRAINT USAGE (AGE < 13) PER REGION



While the 2018 data showed a consistent increase from 2017 to 2018, the 2019 data show a consistent decrease from 2018 to 2019. Taken together, the changes are unlikely indicative of some significant behavioral changes between 2017 and 2018 and back to 2017 levels in 2019. It is advisable to use this or any singular year's data with caution when drawing conclusions. This is especially true at the local and regional level. While some differences may be due to chance because of the large standard errors for region estimates, the Shreveport and Monroe regions had consistently low use rates in the past five surveys. In trying to get a clear and accurate picture of child restraint usage with a low number of data points, looking at multiple years averaged together indicates broader trends and patterns than any singular year. Figure 4.1 shows five-year averages for each region. Restraint usage is highest in the Baton Rouge and New Orleans regions and lowest in the two northern most regions.

FIGURE 4.1: FIVE-YEAR AVERAGE CHILD RESTRAINT USAGE (AGE < 13) PER REGION (2015-2019)



Usage by Louisiana State Police Troop Area

Child restraint usage by Louisiana State Police Troop Area (Table 6) provides a slightly different picture of the child restraint use rates across Louisiana. First, there are nine Troop areas versus 8 Regions; second, while eight of the Troop areas have the same metropolitan centers as the eight regions, they consist of slightly different parishes; third the New Orleans and Baton Rouge Regions are split over three troops, A, B and L. The restraint usage among most of the troops are therefore very similar to the regions they correspond to with the exception of Troop C which has a higher usage rate than corresponding Region 3. This is because of the slightly different selection of parishes. Troop C has had historically high use rates for adults and for children because of the strong enforcement by the Troop C State Police. Troop L has similar child restraint use rates as New Orleans.

TABLE 6: CHILD RESTRAINT USAGE ESTIMATES (PERCENT RESTRAINED) AND ASSOCIATED SAMPLE ERROR BY TROOP AND AGE CATEGORY (2019) — WEIGHTED DATA

Troop Region	Age < 1	Age 1 - 3	Age 4 - 5	Age 6 - 12	Age < 6	Age < 13	Standard Error Age <6	Standard Error Age <13
A (Baton Rouge)	50.0%*	85.9%	69.2%	63.3%	77.3%	67.8%	3.3%	2.2%
B (New Orleans)	100.0%	84.6%	72.0%	85.7%	81.0%	84.1%	3.2%	2.6%
C (Houma)	100.0%	91.2%	78.3%	80.9%	87.7%	83.4%	3.1%	3.3%
D (Lake Charles)	100.0%	97.9%	28.3%	82.1%	73.1%	78.9%	4.2%	2.7%
E (Alexandria)	100.0%	100.0%	72.1%	85.9%	91.2%	87.8%	8.2%	4.0%
F (Monroe)	100.0%	73.2%	67.6%	65.1%	75.1%	68.6%	4.1%	2.8%
G (Shreveport)	91.2%	72.6%	59.5%	84.8%	71.1%	79.7%	3.8%	2.7%
I (Lafayette)	100.0%	98.4%	66.7%	85.4%	87.5%	86.1%	3.7%	4.5%
L (Hammond)	100.0%	87.7%	65.0%	86.1%	79.3%	83.8%	3.7%	4.5%
Standard Error	0.7%	1.9%	3.1%	1.4%	1.5%	1.0%		

**Troop A Includes only 2 children below age 1.*

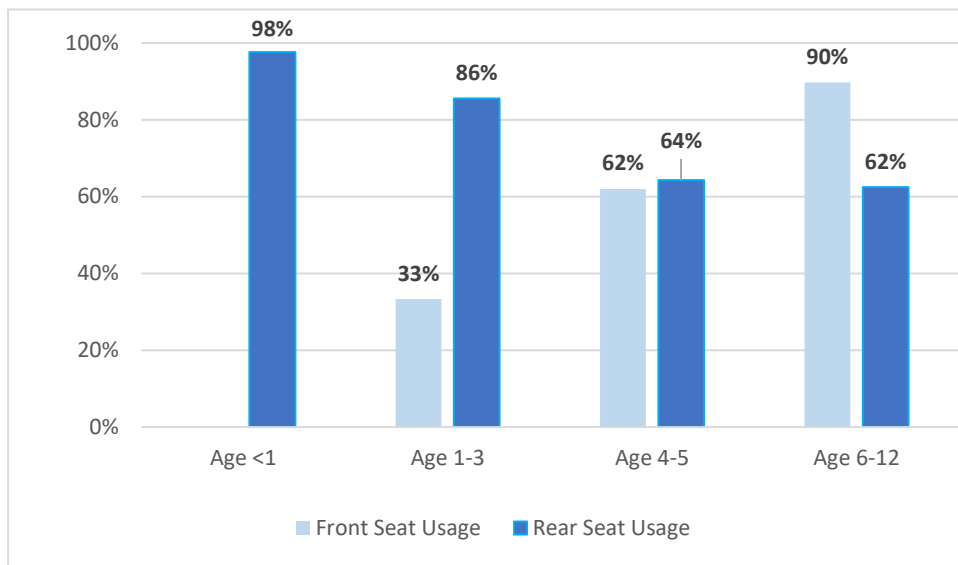
Front Versus Back Seat Usage

The 2019 survey results by seating position show that child restraint use for toddlers (ages 1-3) in front seating positions was very low, 33.3%. (Table 7 and Figure 5). No infant was observed in the front seat. However, it should be noted that there were only 12 toddlers observed in the front seating position. While this is only about 3% of all toddlers observed, these cases show that there is a small minority of drivers who have small children in the front seat positions not using a restraint device.

TABLE 7: CHILD RESTRAINT USAGE ESTIMATES (PERCENT RESTRAINED) AND SAMPLE SIZE (2019)

	Age < 1	Age 1 - 3	Age 4 - 5	Age 6 - 12
Front Seat Usage		33.3%	62.0%	89.7%
Rear Seat Usage	97.6%	85.6%	64.3%	62.5%
Front (N)		12	50	563
Rear (N)	83	388	406	373
Total	83	400	456	936
Front %	0.0%	3.0%	11.0%	60.1%
Rear %	100.0%	97.0%	89.0%	39.9%

FIGURE 5: CHILD RESTRAINT USAGE BY AGE AND SEATING POSITION (2019)



Trends in Child Restraint Usage

PRG observers recorded data for 1,896 children in the 2019 survey. This is higher than the number of observations made for the 2018 survey (1,774), but lower than previous three surveys (1,941, 2,494, and 2,429 respectively).

Comparing the 2019 survey with the 2018 survey found that restraint use for children (ages 12 and younger) was 8 percentage points lower measure to measure (statistically significant at $p = .0001$). The estimate for children ages five and younger was 7.4 percentage points lower than the 2017 estimate (statistically significant at $p = 0.0001$), mainly due to a 11.9 percentage point decline in restraint use among children ages 4-5 and a 8.3 percentage point decline among children ages 6-12 (a statistically significant finding in itself at $p = .0001$). Child restraint usage among infants and toddlers was not statistically significant different from 2018. The usage rate in Louisiana for children ages 6-12 was 79.7% in 2019 compared to 88.1% in 2018 and 74.2% in 2017.

Table 8 and Figure 6 depict usage estimates by age group by year. The restraint use in the 2019 survey was lower than in 2018 for all age groups. This was mainly due to a significant decrease in restraint use in the Baton Rouge and Houma Regions (with past low child restraint use: the Shreveport Region and the Monroe Region). For instance,

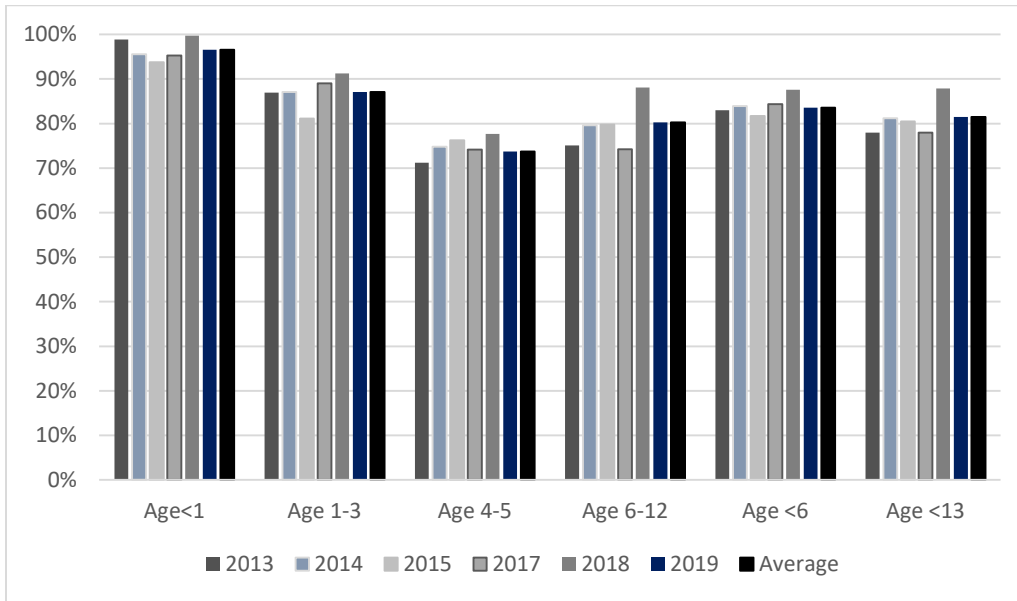
- the 2018-2019 decrease for children ages 5 and younger was 10.7 percentage points in the New Orleans Region, 14.3 percentage points in the Baton Rouge Region and 19.2 percentage points in the Calcasieu Region, although the latter difference was not statistically significant at $p=0.05$.
- for infants from 2018-2019, the largest decline was in the Houma Region (-6.9 percentage points) and the Shreveport Region (-4.1 percentage points), although none of these differences were statistically significant at $p=0.05$.
- the 2018-2019 decrease for children ages 12 and younger was 18.0 percentage points in the Baton Rouge Region, 13.8 percentage points in the Houma Region, 11.4 percentage points in the Lake Charles Region and 13.7 percentage points in the Monroe Region. All four differences were statistically significant at $p=0.05$ but only the differences in the New Orleans and Baton Rouge Regions were statistically significant at $p=0.01$.

TABLE 8: 2013-2019 CHILD RESTRAINT USAGE ESTIMATES BY AGE GROUP

Year	Age < 1	Age 1 - 3	Age 4 - 5	Age 6 - 12	Age < 6	Age < 13
2013	98.9%	86.9%	71.2%	75.1%	83.0%	78.0%
2014	95.6%	87.1%	74.8%	79.6%	83.9%	81.2%
2015	93.8%	81.1%	76.2%	79.7%	81.7%	80.5%
2017	95.3%	89.0%	74.1%	74.2%	84.4%	78.0%
2018	99.8%	91.3%	77.7%	88.1%	87.6%	87.9%
2019	98.3%	86.9%	65.8%	79.7%	80.2%	79.9%
Average 2014–2019*	96.2%	86.2%	74.1%	81.4%	83.4%	82.2%
Difference 2018 to 2019	-1.5%	-4.3%	-11.9%	-8.3%	-7.4%	-8.0%
Standard Error Difference	1.5%	2.3%	3.2%	1.7%	1.8%	1.2%

*Weighted Average

FIGURE 6: 2013-2019 CHILD RESTRAINT USAGE ESTIMATES BY AGE GROUP



A word of caution is appropriate; regionally, the results are less stable when looking at particular age groups year to year, so we should not make too much about those changes by region at the age level (Table 9). There may be variation not captured by the standard error we use - such as ongoing enforcement, time of day, day of week, and different populations of people present. We believe the 5-year average is probably the best indicator of what is going on in the regions by age group.

TABLE 9: FIVE-YEAR AVERAGE CHILD RESTRAINT USAGE ESTIMATES BY AGE GROUP BY REGION (2015-2019)

REGION	Age < 1	Age 1 - 3	Age 4 - 5	Age 6 - 12	Age < 6	Age < 13	STD Error (Age <6)	STD Error (Age 6-12)
1. New Orleans	100.0%	92.9%	86.0%	85.0%	91.6%	87.4%	1.2%	1.1%
2. Baton Rouge	100.0%	95.3%	82.1%	81.9%	91.0%	85.3%	1.0%	0.9%
3. Houma/Thibodaux	92.9%	79.5%	73.3%	78.9%	79.6%	79.1%	2.3%	1.7%
4. Lafayette	97.7%	87.9%	55.7%	82.2%	77.2%	80.4%	1.8%	1.2%
5. Lake Charles	98.9%	95.2%	74.1%	81.3%	87.6%	83.6%	1.8%	1.3%
6. Alexandria	98.5%	90.6%	70.3%	82.8%	84.5%	83.4%	1.5%	1.2%
7. Shreveport	83.3%	64.7%	64.2%	77.2%	68.2%	73.9%	1.7%	1.6%
8. Monroe	89.1%	65.8%	66.0%	73.8%	70.5%	72.6%	1.5%	1.7%
LA	96.2%	86.2%	74.1%	81.4%	83.4%	82.2%	0.6%	0.5%
Standard Error	0.6%	0.8%	1.1%	0.7%	0.6%	0.5%	0.6%	0.8%

Characteristics of Drivers with Children

The 2019 survey had 1,687 drivers with children; 66.2% (n= 1,116) of the drivers were female and 33.7% (n=568) were male. For a small percentage the gender was not determined (0.1%, n=3.). Among drivers, 61.0% were coded as White (n=1,029); 30.5% were coded Black (n=515); 6.1 percent were coded Hispanic (n=102); 2.4 percent were coded Other (n=40) and one driver was coded as unknown. Race/ethnicity of drivers with children in the car closely matched the distribution of licensed drivers in the State of Louisiana in 2018 (66.6% White, 27.5% Black and 5.9% Other).

Driver Belt Use

The seat belt use rate among the drivers in this survey was 88.0% which is slightly higher than the seat belt use rate of 86.9% in 2018. Belt use rates by sex and race are depicted in Table 10. The belt use rates for female drivers is only slightly higher (+1.4 percentage points) than for male drivers in this sample. This is contrary to the results from the 2018 statewide survey which shows that male drivers have a lower belt use rate than female drivers of about 6.8 percentage points. Black drivers in this sample have a relative low belt use rate of 80.5% for female drivers and 76.9% for male drivers, while the 2017 statewide survey shows that black occupants have a belt use rate of 83.8%.

TABLE 10: AVERAGE SEAT BELT USAGE ESTIMATES OF DRIVER BY SEX AND RACE AND SAMPLE SIZE (2019)

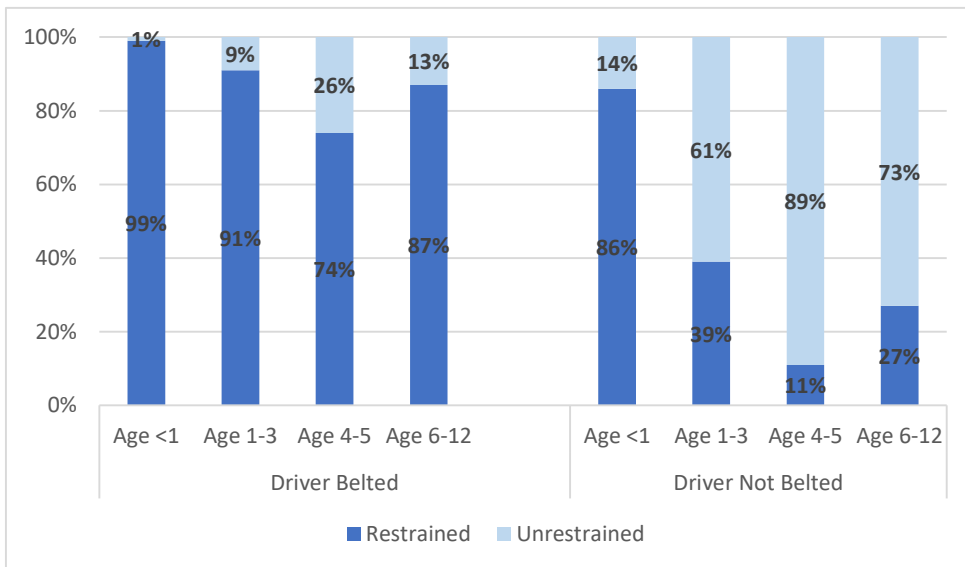
Race/Sex	Male		Female	
	%	#	%	#
White	90.8%	336	92.4%	686
Black	76.9%	169	80.5%	333
Hispanic	97.4%	39	89.7%	58
Other	100.0%	13	92.6%	27
Grand Total	87.3%		88.7%	

*Does not include drivers with unknown sex, race or belt use

How is Driver Belt Use Related to Child Restraint Use?

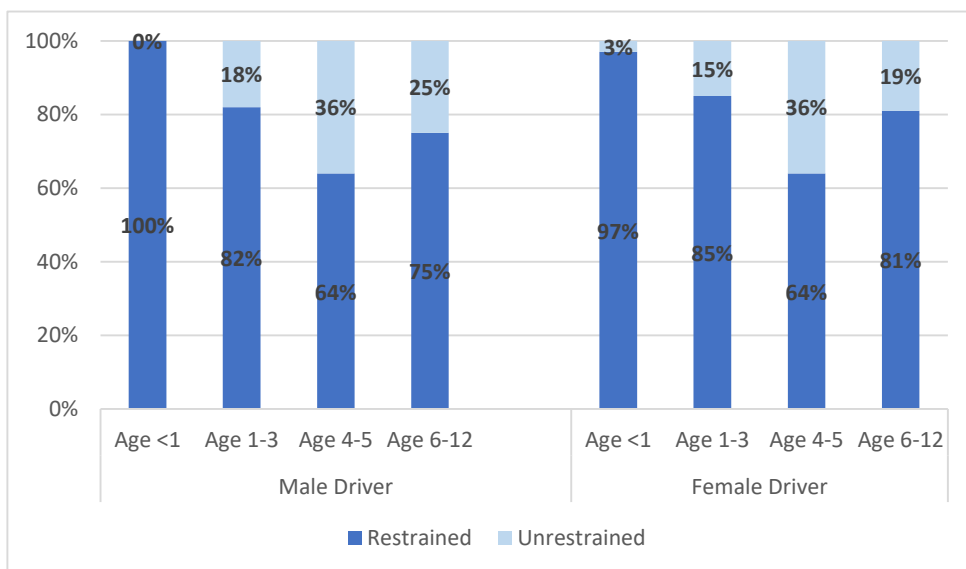
The 2019 child restraint survey found driver belt use is associated with child restraint usage (Figure 7). A child was far less likely to be restrained when a driver was not belted. The survey indicated children 12 and younger were less likely restrained with an unbuckled driver. Only 27% of children ages 6-12 were restrained when the driver was not belted, only 11% of children ages 4-5 restrained when the driver was not belted and only 39% of children ages 1-3 were restrained when the drivers was not belted. In comparison, 87% of children ages 6-12 were restrained when the driver was belted, 74% of children ages 4-5 were restrained when the driver was belted and 91% of children ages 1-3 were restrained when the driver was belted. These results shed light on the importance of seat belt enforcement because drivers who do not buckle up are also very likely to put their children at risk by not restraining them.

FIGURE 7: CHILD RESTRAINT USAGE ESTIMATE BY AGE GROUP AND DRIVER BELT USE (2019)



There were only slight differences (although not statistically significant) between male and female drivers with respect to restraining their children (Figure 8). The 2019 results are similar to the 2018 survey results.

FIGURE 8: CHILD RESTRAINT USAGE ESTIMATE BY AGE GROUP AND DRIVER SEX (2019)



The 2019 survey showed that there are differences among the race/ethnicities of drivers with respect to restraining their children. However, since the number of Hispanics was too small to draw reliable conclusions, the 2018 and 2019 surveys were combined to analyze child restraint use by race versus driver seat belt use (Table 11 and Figure 9). The combined survey data indicate that only 1 in 10 children ages 1-12 were restrained with an unbuckled black driver, only 1 in 17 children ages 1-12 were restrained with an unbuckled Hispanic driver and 1 in 3 children ages 1-12 were restrained with an unbuckled white driver.

FIGURE 9: CHILD RESTRAINT USAGE ESTIMATE FOR CHILDREN AGES 1-12 BY DRIVER RACE/ETHNICITY (2018-2019)

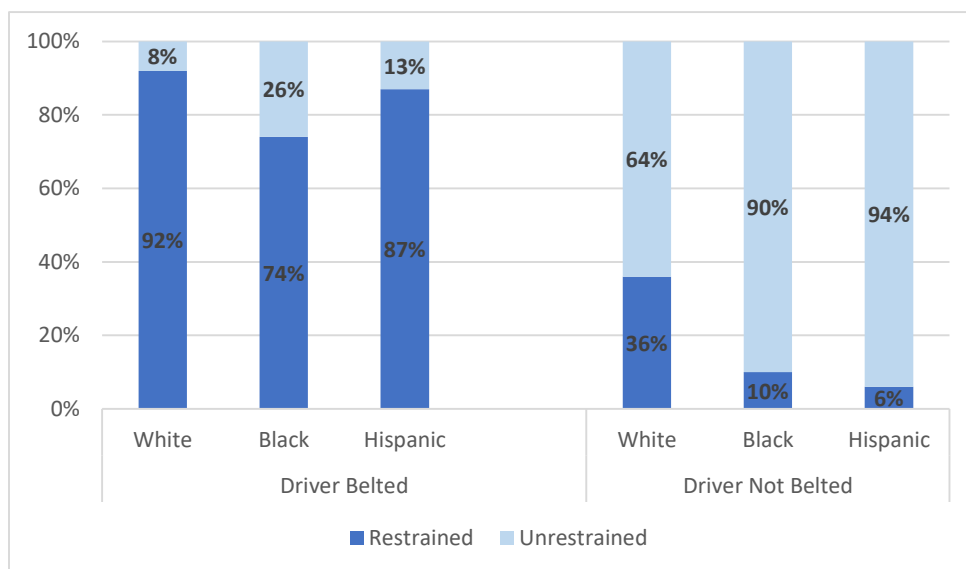


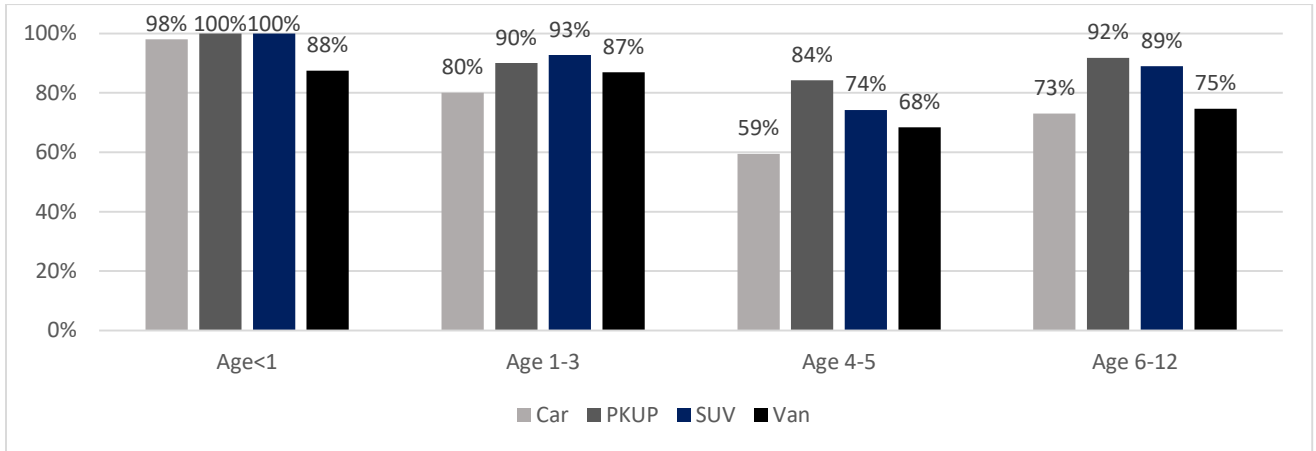
TABLE 11: CHILD RESTRAINT USAGE ESTIMATE BY DRIVER SEX AND RACE FOR CHILDREN AGES 1-12 (2018-2019)

	Race	No Child Restraint		Child Restraint	
		%	#	%	#
Driver Seat Belt Used	White	8%	123	92%	1,498
	Black	26%	164	74%	459
	Hispanic	13%	15	87%	97
Driver Seat Belt Not Used	White	64%	78	36%	44
	Black	90%	139	10%	15
	Hispanic	94%	16	6%	1

Includes only cases with known race and belt use

Figure 10 depicts child restraint use by vehicle type. While there are some apparent differences between child restraint use in different vehicles, the differences are not statistically significant and thus should not be over interpreted.

FIGURE 10: CHILD RESTRAINT USAGE ESTIMATE BY VEHICLE TYPE (2019)



CONCLUSIONS

Preusser Research Group, Inc. (PRG) carried out the 2019 child restraint survey. It was the sixth time PRG was tasked to conduct the survey. There are several shortcomings of this survey. The survey attempts to estimate the child restraint usage on Louisiana roads and highways which would require observations on a random sample of vehicles on Louisiana roads and highways. However, it is not practically feasible to observe whether a child is restrained in a vehicle on a busy highway. Therefore, the Louisiana child restraint survey relies on a convenient sample taken at randomly selected shopping areas where vehicles moving slow enough to observe whether children are restrained or not. These include, malls, shopping centers, Wal-Mart supercenters, grocery stores, movie theaters, etc. This approach does not guarantee that the sample average is an unbiased estimate of the true child restraint use rate in Louisiana. In fact, it is likely that the estimate is lower than the true use rate. For instance, we know from the Louisiana adult seatbelt use rate survey that interstate adult seat belt use rates are about four percentage points higher than local adult use rates. Thus, the Louisiana child restraint survey taken at local stores is more likely to estimate the local child restraint use rate rather than the overall child restraint use rate which would include interstates.

Since the sample size for the Louisiana child restraint observational survey is relatively small, the design attempts to reduce the sampling error by keeping several factors constant from year to year. For instance, the day of week, the time of day, the month, the approximate day in the month and day of week the observations were taken at the 69 locations were kept the same from year to year. The same three observers were used in 2018 and 2019.

Although efforts were undertaken to minimize the error, there might be variation in the data from year to year that is not accounted for in the standard error computation of the sampling error. For instance, the observation time was kept at one hour at each location. This had the effect that the number of vehicles at each location could vary considerably from year to year between 12% and 300%. As a result, the sample sizes on the weekend varied considerably over the past three years with 77% on Sundays and 53% on Saturdays between the lowest and highest sample size. The child restraint usage rate varied by about 22 percentage points over the week in 2017 and 2019 and about 13 percentage points in 2018. While the data were weighted by parish population, this does not fully account for the variation in sample sizes at the location.

Because the observers have to make a judgment regarding restraint use, the survey results are prone to measurement errors which is not accounted for in the sampling standard error computation.

These shortcomings of the survey must be taken into consideration when interpreting the results of the survey. The true standard errors are likely much larger than the standard error computation of the weighted error suggests. For that reason, variations in the estimate from year to year should be interpreted with caution. Much of the change in the child restraint usage rate from 78.0% in 2017 to 87.9% in 2018 and 79.9% in 2019 is due to randomness. Examining the five-year average is recommended for a more reinforced current landscape of child restraint use, especially at the regional level.

Nevertheless, there are some important insights that can be derived from the 2019 survey and past surveys. Specifically, the results of the 2019 survey confirm findings from prior surveys, indicating that:

- A very high percentage of infants travelling in Louisiana are riding in a child restraint (98.3%, 2019, 96.2%, 5-year average).
- Restraint use is somewhat lower for children ages 1-3 (86.9%, 2019, 86.2% 5-year average).
- Four and five-year old children were observed least often in a restraint (65.8% in 2019; 74.1% for 5-year average). One reason may be that these children don't fit in a child seat and standard seat belts are not suitable to restrain them. Furthermore, booster seats are not purchased at the same frequency as child seats for infants. This age group requires further study to identify solutions to the problem.
- Older children, ages 6-12, were using a seat belt 79.7% of the time in 2019 and 81.4% for the 5-year average.
- There is a consistent difference in the child restraint use between north Louisiana and south Louisiana. The northern regions child restraint use rate was 10 points lower than the southern regions, for the 5-year average.
- The Baton Rouge Region had a very low child restraint usage rate in the 2019 survey, which contributed to a lower statewide rate. However, this result should be interpreted with caution.
- Children are more likely to ride in the front seat as they grow older and front seat restraint use was higher among older age children. The reverse was true in the rear seat, where younger children were more likely using a restraint in the rear seat. There is still room for improvement in child restraint use in both the front and rear seating positions and this is especially true among children ages four and older.

This is the second Louisiana child restraint use survey that also includes driver characteristics. The survey indicates that:

- Drivers, who do not buckle up, likely do not restrain child passengers either (74%).
- There are no statistically significant differences for driver gender with respect to child restraint use.
- There are differences for driver race with respect to restraining a child when the driver is not buckling up. The percentage of children (ages 1-12) not restrained for Black and Hispanic drivers who were not buckled up, was 90% and 94%, respectively in 2018-2019; the rate was 66% for White drivers.

REFERENCES

National Center for Statistics and Analysis (2017, October). Lives saved in 2016 by restraint use and minimum-drinking-age laws (Traffic Safety Facts Crash Stats. Report No. DOT HS 812 454). Washington, DC: National Highway Traffic Safety Administration

National Center for Statistics and Analysis. (2016, April). Occupant protection in passenger vehicles: 2014 data (Traffic Safety Facts. Report No. DOT HS 812 262). Washington, DC: National Highway Traffic Safety Administration.



APPENDIX A. CHILD RESTRAINT SURVEY DATA COLLECTION FORM



Louisiana Child Restraint Use Data Collection Form 2018



SITE #: _____ PARISH: _____ Observer Name: _____ DATE: _____



TIME: _____ a.m. p.m. DAY OF WEEK: Sun M Tu W Th F Sat DIRECTION OF TRAVEL: N S E W
 (circle one) (circle one)

LOCATION: _____
 (street) (cross street or other landmark)

VEHICLE TYPE:		DRIVER			
<input type="checkbox"/> Passenger Car <input type="checkbox"/> SUV <input type="checkbox"/> Van/Minivan <input type="checkbox"/> Pickup Truck		RESTRAINT USE: <input type="checkbox"/> Belted <input type="checkbox"/> Unknown <input type="checkbox"/> Not Belted	GENDER: <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Unknown	RACE: <input type="checkbox"/> White <input type="checkbox"/> Hispanic <input type="checkbox"/> Unknown <input type="checkbox"/> Black <input type="checkbox"/> Other	
CHILD PASSENGER 1		CHILD PASSENGER 2			
RESTRAINT USE: <input type="checkbox"/> Standard Belt <input type="checkbox"/> Backless Booster <input type="checkbox"/> Rear-Facing CSS <input type="checkbox"/> Not Belted <input type="checkbox"/> Front-Facing CSS <input type="checkbox"/> Unknown <input type="checkbox"/> High Back Booster		AGE: <input type="checkbox"/> <1 <input type="checkbox"/> 1-3 <input type="checkbox"/> 4-5 <input type="checkbox"/> 6-12	 Seating Position	RESTRAINT USE: <input type="checkbox"/> Standard Belt <input type="checkbox"/> Backless Booster <input type="checkbox"/> Rear-Facing CSS <input type="checkbox"/> Not Belted <input type="checkbox"/> Front-Facing CSS <input type="checkbox"/> Unknown <input type="checkbox"/> High Back Booster	
AGE: <input type="checkbox"/> <1 <input type="checkbox"/> 1-3 <input type="checkbox"/> 4-5 <input type="checkbox"/> 6-12		 Seating Position			

VEHICLE TYPE:		DRIVER			
<input type="checkbox"/> Passenger Car <input type="checkbox"/> SUV <input type="checkbox"/> Van/Minivan <input type="checkbox"/> Pickup Truck		RESTRAINT USE: <input type="checkbox"/> Belted <input type="checkbox"/> Unknown <input type="checkbox"/> Not Belted	GENDER: <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Unknown	RACE: <input type="checkbox"/> White <input type="checkbox"/> Hispanic <input type="checkbox"/> Unknown <input type="checkbox"/> Black <input type="checkbox"/> Other	
CHILD PASSENGER 1		CHILD PASSENGER 2			
RESTRAINT USE: <input type="checkbox"/> Standard Belt <input type="checkbox"/> Backless Booster <input type="checkbox"/> Rear-Facing CSS <input type="checkbox"/> Not Belted <input type="checkbox"/> Front-Facing CSS <input type="checkbox"/> Unknown <input type="checkbox"/> High Back Booster		AGE: <input type="checkbox"/> <1 <input type="checkbox"/> 1-3 <input type="checkbox"/> 4-5 <input type="checkbox"/> 6-12	 Seating Position	RESTRAINT USE: <input type="checkbox"/> Standard Belt <input type="checkbox"/> Backless Booster <input type="checkbox"/> Rear-Facing CSS <input type="checkbox"/> Not Belted <input type="checkbox"/> Front-Facing CSS <input type="checkbox"/> Unknown <input type="checkbox"/> High Back Booster	
AGE: <input type="checkbox"/> <1 <input type="checkbox"/> 1-3 <input type="checkbox"/> 4-5 <input type="checkbox"/> 6-12		 Seating Position			

VEHICLE TYPE:		DRIVER			
<input type="checkbox"/> Passenger Car <input type="checkbox"/> SUV <input type="checkbox"/> Van/Minivan <input type="checkbox"/> Pickup Truck		RESTRAINT USE: <input type="checkbox"/> Belted <input type="checkbox"/> Unknown <input type="checkbox"/> Not Belted	GENDER: <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Unknown	RACE: <input type="checkbox"/> White <input type="checkbox"/> Hispanic <input type="checkbox"/> Unknown <input type="checkbox"/> Black <input type="checkbox"/> Other	
CHILD PASSENGER 1		CHILD PASSENGER 2			
RESTRAINT USE: <input type="checkbox"/> Standard Belt <input type="checkbox"/> Backless Booster <input type="checkbox"/> Rear-Facing CSS <input type="checkbox"/> Not Belted <input type="checkbox"/> Front-Facing CSS <input type="checkbox"/> Unknown <input type="checkbox"/> High Back Booster		AGE: <input type="checkbox"/> <1 <input type="checkbox"/> 1-3 <input type="checkbox"/> 4-5 <input type="checkbox"/> 6-12	 Seating Position	RESTRAINT USE: <input type="checkbox"/> Standard Belt <input type="checkbox"/> Backless Booster <input type="checkbox"/> Rear-Facing CSS <input type="checkbox"/> Not Belted <input type="checkbox"/> Front-Facing CSS <input type="checkbox"/> Unknown <input type="checkbox"/> High Back Booster	
AGE: <input type="checkbox"/> <1 <input type="checkbox"/> 1-3 <input type="checkbox"/> 4-5 <input type="checkbox"/> 6-12		 Seating Position			

VEHICLE TYPE:		DRIVER			
<input type="checkbox"/> Passenger Car <input type="checkbox"/> SUV <input type="checkbox"/> Van/Minivan <input type="checkbox"/> Pickup Truck		RESTRAINT USE: <input type="checkbox"/> Belted <input type="checkbox"/> Unknown <input type="checkbox"/> Not Belted	GENDER: <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Unknown	RACE: <input type="checkbox"/> White <input type="checkbox"/> Hispanic <input type="checkbox"/> Unknown <input type="checkbox"/> Black <input type="checkbox"/> Other	
CHILD PASSENGER 1		CHILD PASSENGER 2			
RESTRAINT USE: <input type="checkbox"/> Standard Belt <input type="checkbox"/> Backless Booster <input type="checkbox"/> Rear-Facing CSS <input type="checkbox"/> Not Belted <input type="checkbox"/> Front-Facing CSS <input type="checkbox"/> Unknown <input type="checkbox"/> High Back Booster		AGE: <input type="checkbox"/> <1 <input type="checkbox"/> 1-3 <input type="checkbox"/> 4-5 <input type="checkbox"/> 6-12	 Seating Position	RESTRAINT USE: <input type="checkbox"/> Standard Belt <input type="checkbox"/> Backless Booster <input type="checkbox"/> Rear-Facing CSS <input type="checkbox"/> Not Belted <input type="checkbox"/> Front-Facing CSS <input type="checkbox"/> Unknown <input type="checkbox"/> High Back Booster	
AGE: <input type="checkbox"/> <1 <input type="checkbox"/> 1-3 <input type="checkbox"/> 4-5 <input type="checkbox"/> 6-12		 Seating Position			