2004
Occupant Protection
Evaluation Report
Covering the Period of Performance:
October 1, 2003, through September 30, 2004

Submitted to:
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I. Project History

The objective of the "157 Innovative and Discretionary" Projects was to increase seat belt usage for all motor vehicle drivers and front seat passengers. The Louisiana Highway Safety Commission (LHSC) conducted a seat belt program/project from October 2001 to August 2002. The purpose of this project was to evaluate whether media and enforcement efforts would cause an increase in seat belt usage and subsequently a reduction in traffic injuries and fatalities. Agencies of 11 parishes participated in the seat belt program initiative. The following facts highlight the key findings of the study (see the 2002 Strap-In Evaluation Report covering the period of performance: October 1, 2001, through August 31, 2002): While enforcement was increased by 14%, public awareness of enforcement was increased significantly (by about 5 percentage points), seat belt use was increased by 1.8 percentage points and the injury percentage was reduced by 0.8 percentage points. The telephone survey also revealed some interesting insights into the "perception" of drivers. Twenty percent more drivers claim they wear seat belts than observational studies show (90% versus 70%). Only about 3% of all drivers admit that they rarely or never wear a seat belt. Furthermore, more than 30% believe that seat belts could potentially be more harmful than helpful. These findings indicate that more public education is necessary. Overall, the project provided sufficient evidence to conclude that public education combined with significant enforcement increases seat belt usage.

Based on the success of the Year Two Project, the 3rd Year Project concentrated on determining whether paid media is more effective than earned media with respect to increasing seat belt use and whether enhanced enforcement is more effective with earned media or with paid media. This project's objective was to study the effect of enhanced enforcement and media type on seat belt usage. The main findings were (see 2003 Report):

- *Enhanced enforcement by itself increases seat belt usage.*
- *Enhanced enforcement increases the perception that "police write more tickets" more than media messages do.*
- *Earned media is equally as effective as paid media in increasing awareness of seat belt issues.*
- *Enhancing enforcement is more effective when accompanied with paid media than with earned media.*

In the year 2003/2004, 22 parishes were selected for media campaigns and overtime enforcement. This evaluation report reviews the enforcement efforts, media campaign and crash statistics from October 2003 to September 2004. However, this report will be preliminary in nature because much of the data for the third quarter of 2004 are not yet available.

Of the 77 agencies from the 22 parishes selected by the Louisiana Highway Safety Commission, only 65 agencies in 21 parishes participated. These 21 parishes represent 75% of licensed drivers, 63% of fatal crashes, 83% of injury crashes, and 84% of all property-damage-only crashes in Louisiana. These parishes also represent 61% of all drivers killed not wearing a safety belt. Details of the crash statistics for these 21 parishes are presented in Table 1.

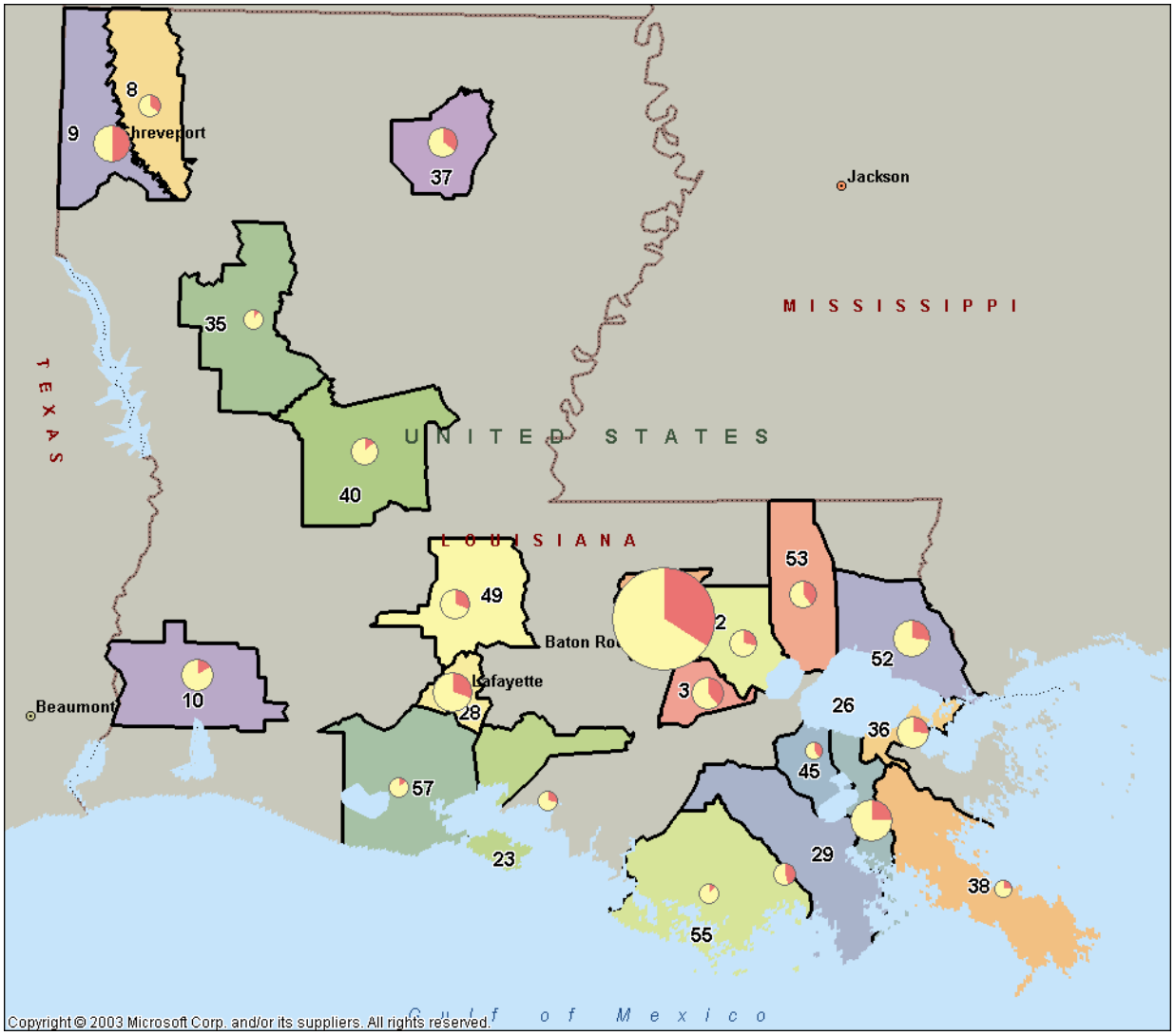
Table 1: Statistics of Selected Parishes

Parish Code	Parish	Fatal Crashes	Injury Crashes	Fatalities	Injuries	Property Damage Only	Licensed Drivers	Fatal Drivers with Seat belt	Fatal Drivers w/o Seat belt	% Fatal Drivers w/o Seat belt
3	ASCENSION	20	844	24	1535	2014	54431	7	9	56%
8	BOSSIER	14	1123	14	1838	2372	93413	6	7	54%
9	CADDO	38	2908	40	4467	6687	151787	11	11	50%
10	CALCASIEU	24	2443	25	4472	5057	124876	3	12	80%
17	EBR	58	5776	67	9528	15269	252823	15	25	63%
23	IBERIA	13	623	14	1129	1383	46335	2	5	71%
26	JEFFERSON	43	4519	44	6985	13563	301617	6	8	57%
28	LAFAYETTE	38	2703	46	4414	7310	131370	7	10	59%
29	LAFOURCHE	21	868	24	1477	1943	57692	4	2	33%
32	LIVINGSTON	16	966	19	1666	1453	65690	4	10	71%
35	NATCHITOCHES	10	465	12	814	746	22321	1	8	89%
36	ORLEANS	39	7267	39	12526	17535	233751	5	5	50%
37	OUACHITA	25	1788	29	3062	3927	91619	4	4	50%
38	PLAQUEMINES	5	131	5	225	305	17339	1	3	75%
40	RAPIDES	23	1764	26	3122	3202	82656	6	10	63%
45	ST. CHARLES	7	460	11	794	1230	32920	2	2	50%
49	ST. LANDRY	21	855	25	1620	1650	55748	5	10	67%
52	ST. TAMMANY	36	1845	43	2995	4714	143562	6	15	71%
53	TANGIPAHOA	23	1388	24	2523	2664	65191	1	6	86%
55	TERREBONNE	16	1063	16	1800	2528	71527	2	10	83%
57	VERMILION	10	484	10	764	901	36291	1	6	86%
	Louisiana	791	48,749	902	82,757	114,898	2,829,381	153	293	
	% of LA	63%	83%	62%	82%	84%	75%	65%	61%	

Figure 1 shows the driver fatalities in the selected parishes with and without a safety belt. The driver fatalities in 2003 were by far the highest in EBR with 44 driver fatalities, 25 of which were not restrained by a safety belt, while 15 had been wearing a safety belt and for 4 drivers safety belt use was unknown.

Figure 1: Driver Fatalities with and without Safety Belt

(with safety belt in red, without safety belt in yellow)
(Size of pie proportional to number of fatalities)
(Numbers in map refer to parish codes, see Table 1)



II. Enforcement Effort

The implementation of the project called for enhanced enforcement involving 65 police agencies including the State Police, several sheriffs' offices, and the city police departments during two waves, November 2003 and May 2004. The Louisiana State Police overtime enforcement effort overlapped several of the parishes. Each agency participating in the Louisiana Highway Safety Program was required to report their overtime hours and the number of seat belt violations issued during these waves.

Appendix A gives detailed statistics regarding the enforcement results. Table A1 shows the participating agencies in the yearlong program, the number of overtime hours, the number of safety belt citations, and the average number of citations per hour. Table A2 shows the same statistics for the November and May campaigns. Table A3 shows the statistics for both programs sorted by number of citations per hour. The tables show that 28 agencies participated in the yearlong program and 57 agencies participated in the November 2003 and May 2004 campaigns. In total, 66 agencies participated either in the yearlong campaign or in the campaigns. Overall, there were 40,136 safety belt citations written in 20,959 hours, on the average 1.9 citations per hour (Table A3). The standard deviation for the number of citations per hour was 0.8 and it ranged from a low of 0.1 to a high of 3.6. Of the 40,136 citations, 30,359 were written during the yearlong program and 9,777 in the November/May campaigns.

Table 2 depicts the overtime hours and safety belt citations for LHSC–contracted police agencies during the two waves and the yearlong program. The number of overtime hours and tickets written during these hours may not be a good predictor because of various sizes of parishes. Therefore, we also displayed in the table the number of licensed drivers in the parishes and the enforcement rate of tickets written per 1000 licensed drivers. This enforcement rate may be a better predictor of seat belt compliance. Thus we will test the hypothesis that the rate of tickets written per 1000 licensed drivers serves as a predictor for seat belt compliance in a parish.

Table 2: Local Agencies Overtime Enforcement Efforts
(Excluding State Police)

Parish Code	Parish	Hours-total	Citations	Tickets/ Hour	Drivers	Tickets per 1000 Licensed Drivers	%Seat belt Use	Cars
1	Acadia	98	266	2.7	36939	7	73%	76%
3	Ascension	502	1102	2.2	52038	21	75%	80%
8	Bossier	996	2149	2.2	62622	34	80%	80%
9	Caddo	842	1565	1.9	154303	10	78%	77%
10	Calcasieu	715	1691	2.4	125475	13	77%	79%
17	East Baton Rouge	100	113	1.1	259520	0.4	73%	75%
23	Iberia	338	720	2.1	46791	15	74%	74%
26	Jefferson	1108	3489	3.2	307548	11	75%	79%
28	Lafayette	533	1404	2.6	131134	11	74%	78%
29	Lafourche	370	248	0.7	57866	4	86%	88%
32	Livingston	1062	1434	1.4	63087	23	73%	79%
35	Natchitoches	285	629	2.2	22428	28	67%	69%
36	Orleans	1209	3070	2.5	237858	13	74%	76%
37	Ouachita	1680	3262	1.9	92105	35	77%	77%
38	Plaquemines	100	142	1.4	17227	8	58%	60%
40	Rapides	756	1120	1.5	83692	13	76%	77%
45	St. Charles	547	1391	2.5	32768	42	80%	84%
49	St. Landry	843	1710	2.0	56017	31	77%	78%
52	St. Tammany	1669	2663	1.6	139982	19	72%	80%
53	Tangipahoa	809	1401	1.7	64091	22	67%	72%
55	Terrebonne	358	1284	3.6	71754	18	85%	87%
57	Vermillion	100	191	1.9	36867	5	74%	76%

Figure 2 shows the percentage of safety belt use in a parish versus the number of safety belt citations written per 1000 licensed drivers. There is a weak linear relationship suggesting that the percentage of safety belt use increases by 1% for every ticket written per 100 licensed drivers. There are some apparent outliers, which are highlighted in Table 2. Lafourche Parish has a very high safety belt usage but low (4) enforcement. However, both Lafourche and Terrebonne Parishes are in Troop C, which has generally very high regular safety belt enforcement. Natchitoches Parish has a very low safety belt usage rate but a relatively high average number of tickets per licensed drivers. However, the Natchitoches Police Department stopped reporting in April of 2004 and thus may have stopped participating in the program. Tangipahoa Parish has a low safety belt usage rate mainly because of a low usage rate of pickup trucks. The Tangipahoa Sheriff's Office stopped participating in May of 2004. Plaquemines Parish has both a low safety belt usage rate and low law enforcement rate. When these outliers are removed, the linear regression analysis shows a significant relationship between tickets per licensed drivers and percentage seat belt use. The slope is 0.00135 (p=0.005) with an R^2 of 39%. This means that the seat belt usage increases by 1% for every 7 tickets written per 1000 licensed drivers.

Figure 2: Percentage Safety Belt Use versus Tickets per 1000 Licensed Drivers

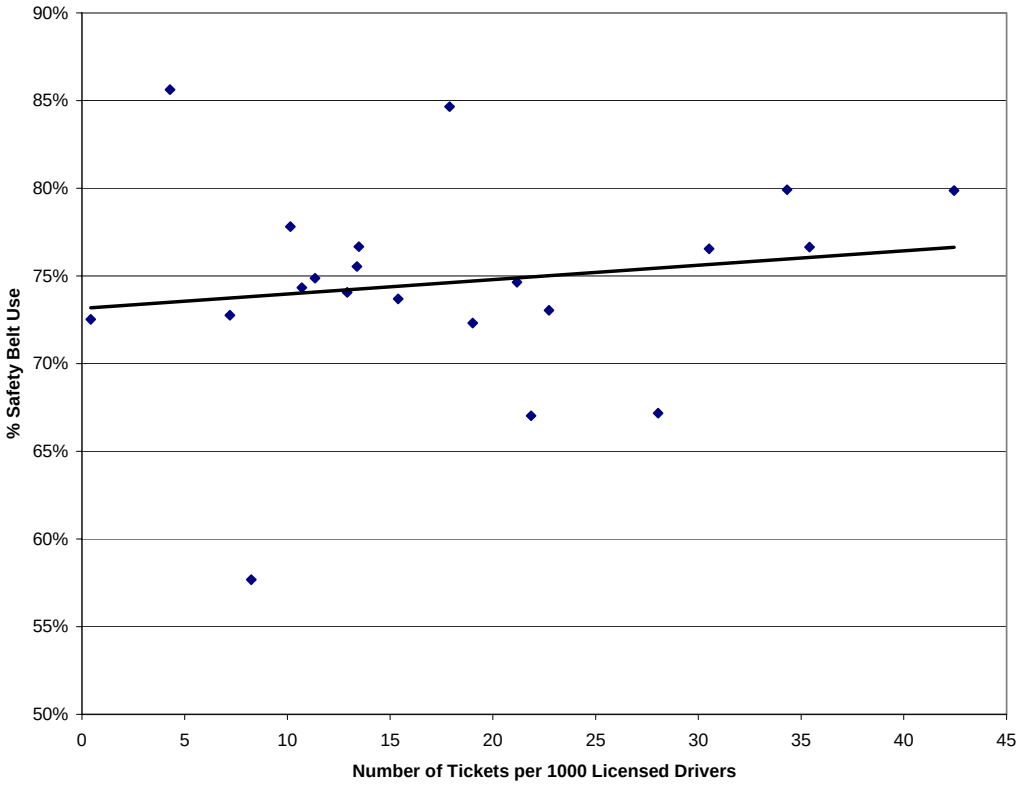


Table 3 shows the crash statistics along with the distribution of overtime funds. Although the 21 selected parishes as a whole represented 75% of licensed drivers, the actual distribution of the overtime funds to parishes did not reflect the relative percentage of people killed not wearing safety belts in the parish. For instance, EBR had 13% of all drivers killed without safety belts in the 21 parishes but received less than 1% of the funding. This was due to the Baton Rouge Police Department and the East Baton Rouge Sheriff's Office not participating in the program.

Table 3: Crash Statistics and Distribution of Funds

(Note: Funds are allocated funds, not actual expenditures)

Parish Code	Parish	Fatal Crashes	Fatalities	Fatal Drivers w Seat belt	Fatal Drivers w/o Seat belt	Driver Fatalities w/o Seat belt % of Total	Total Allocated Funds	% of funding
3	Ascension	20	24	7	11	5%	$ 43,754	4%
8	Bossier	14	14	4	7	3%	$ 89,296	9%
9	Caddo	38	40	11	11	5%	$ 41,400	5%
10	Calcasieu	24	25	3	15	7%	$ 85,400	10%
17	East Baton Rouge	58	67	15	29	13%	$ 4,700	1%
23	Iberia	13	14	2	5	2%	$ 32,100	4%
26	Jefferson	43	44	6	18	8%	$ 80,274	11%
28	Lafayette	38	46	7	16	7%	$ 69,750	11%
29	Lafourche	21	24	5	6	3%	$ 30,000	5%
32	Livingston	16	19	4	10	5%	$ 45,912	9%
35	Natchitoches	10	12	1	8	5%	$ 48,015	10%
36	Orleans	39	39	5	14	6%	$ 64,500	15%
37	Ouachita	25	29	6	11	5%	$ 64,274	17%
38	Plaquemines	5	5	1	3	1%	$ 4,000	1%
40	Rapides	23	26	2	13	6%	$ 68,000	22%
45	St. Charles	7	11	2	3	1%	$ 35,416	15%
49	St. Landry	21	25	5	11	5%	$ 36,450	18%
52	St. Tammany	36	43	6	16	7%	$ 93,235	56%
53	Tangipahoa	23	24	6	9	4%	$ 31,713	43%
55	Terrebonne	16	16	1	7	3%	$ 34,800	83%
57	Vermilion	10	10	1	6	3%	$ 7,120	100%

III. Media/Public Relations Campaign Implementation

The goal of the media campaign was to reach a statewide audience by purchasing a combination of radio and television advertisements. During the November 2003 and May 2004 Buckle Up America Campaigns, the LHSC contracted with Kaplan Advertising to coordinate the paid media buy throughout the state. Overall, the media buy included 68,863 television spots during the November 2003 campaign and 73,704 television spots during the May 2004 campaign. Details are depicted in Table 4. Overall the television spots were viewed over 150 million times. The highest viewing was in New Orleans and the lowest was in Alexandria. Baton Rouge had the fourth lowest viewing.

Table 4: Media Buy in November 2003 and May 2004

City	November			May			Total		
	TV $	TV Spots	Times Viewed	TV $	TV Spots	Times Viewed	TV $	TV Spots	Times Viewed
Alexandria	$ 8,565	3411	955,080	$ 34,836	4115	1,303,960	$ 43,401	7,526	2,259,040
Baton Rouge	$ 22,072	3894	3,855,060	$ 74,039	4909	5,330,853	$ 96,112	8,803	9,185,913
Lafayette	$ 19,523	4901	6,028,230	$ 59,011	5210	7,115,058	$ 78,534	10,111	13,143,288
Lake Charles	$ 7,256	3516	984,480	$ 38,167	4193	2,198,966	$ 45,424	7,709	3,183,446
Monroe	$ 12,651	6556	3,343,560	$ 66,848	7654	4,153,338	$ 79,499	14,210	7,496,898
New Orleans	$ 81,709	10021	19,741,370	$ 176,230	8349	17,988,858	$ 257,938	18,370	37,730,228
Shreveport	$ 27,647	4265	4,606,200	$ 92,960	4844	5,851,224	$ 120,606	9,109	10,457,424
Total	$ 331,198	68863	74,421,760	$ 991,222	73704	82,033,290	$ 1,322,420	142,567	156,455,050

IV. Observational Survey

The survey is based on a new design approved by NHTSA. The basic design for this survey consists of a multi-stage probability sample of 417 road segments. The sampling design used the following principles:

- 35 of the 64 Parishes making up 85% of the population were eligible for inclusion in the sample.
- The survey provides results for the individual 8 regions.
- The second stage divides each region into the parishes comprising the region and falling into the group of parishes which make up the 85% of the population.
- Seat belt usage on interstates is significantly higher than seat belt usage on US highways and state roads, and seat belt usage on US highways and state roads is significantly higher than on local roads. Thus the sample within a parish is stratified for road classes.
- Specific locations are selected from a list of highways and local roads. The probability of selection is based on VMT.

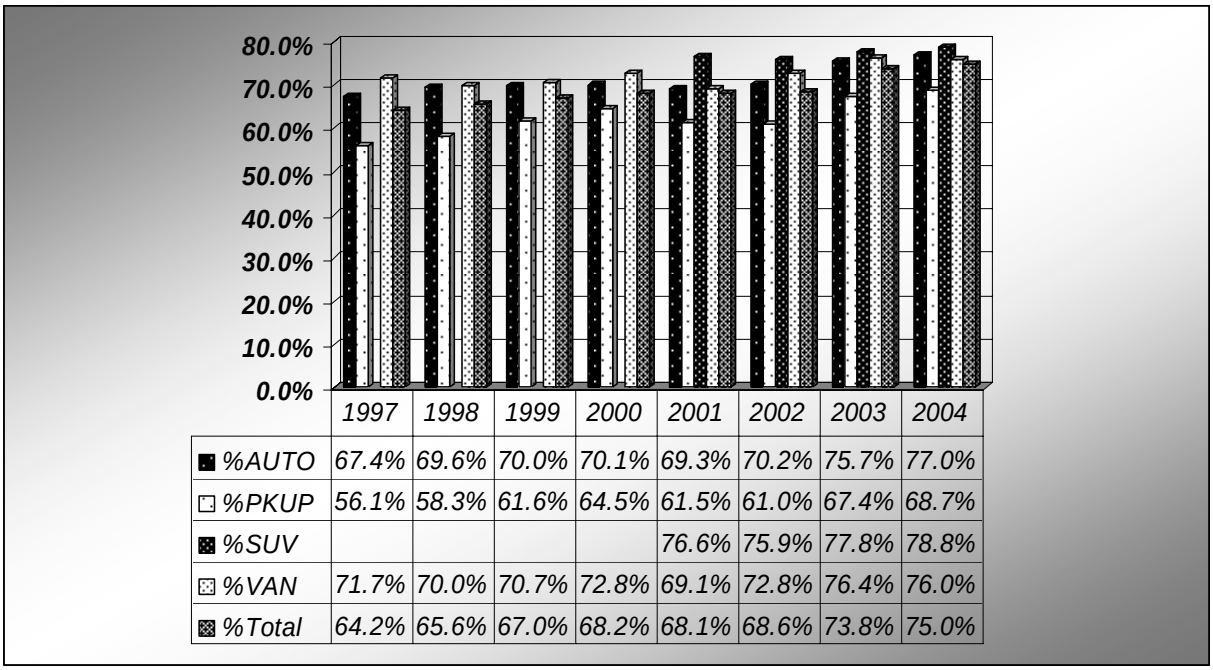
The study is based on two enforcement waves and two media campaigns; the first wave was in November 2003 and the second was in May 2004. Southern Media and Opinion Research conducted an observational survey in August of 2004. Table 5 depicts the sample size for the new design. Overall, the new design has an increased sample size of 24% when compared to 2003.

Table 5: Sample Size of 2004 Survey

Year	Auto	PKUP	SUV	VAN	TOTAL	MTRCYC
2004	39,967	22,945	14,700	7,245	84,857	333
2003	31,436	20,012	10,721	6,080	68,249	192
Diff	8,531	2,933	3,979	1,165	16,608	141
% Sample size Increase	27%	15%	37%	19%	24%	73%

Figure 3 shows the percentage of seat belt usage by vehicle type from 1997 to 2004. There was an increase of 1.2 percentage points in safety belt usage from 2003 to 2004.

Figure 3: Observational Survey Results



	1997	1998	1999	2000	2001	2002	2003	2004
%AUTO	67.4%	69.6%	70.0%	70.1%	69.3%	70.2%	75.7%	77.0%
%PKUP	56.1%	58.3%	61.6%	64.5%	61.5%	61.0%	67.4%	68.7%
%SUV					76.6%	75.9%	77.8%	78.8%
%VAN	71.7%	70.0%	70.7%	72.8%	69.1%	72.8%	76.4%	76.0%
%Total	64.2%	65.6%	67.0%	68.2%	68.1%	68.6%	73.8%	75.0%

The increase in safety belt usage was consistent over all vehicle types with the exception of vans (1.3% for autos, 1.3% for pickup trucks, 1.0% for SUVs, and -0.4 for vans). The standard error of the estimate was 0.3 percentage points. Hence it can be concluded that the 1.2 percentage point increase was statistically significant at the alpha=0.05 level.

V. Crash Analysis

The reduction of injuries and fatalities is the overall goal of the seat belt campaigns. Overtime for police officers, designated exclusively for seat belt enforcement, should lead to an increase in seat belt enforcement. Public information and education, combined with the seat belt enforcement effort, should yield a higher propensity for drivers and passengers to wear seat belts while traveling. Though these efforts do not directly affect the number of observed crashes, the increased seat belt usage should lead to a reduction in the percentages of injuries and fatalities in these crashes.

Several factors make the analysis of traffic crash data difficult:

1. Louisiana law does not require passengers in the back seat of vehicles to wear seat belts. In addition, observational surveys only observed front seat usage. Therefore, using all occupant injuries and fatality data may not be related to the observed safety belt usage because of the fact that back-seat occupants may or may not wear a seat belt. Another confounding factor is the number of occupants which varies from car to car. Hence, we expect a more significant relationship between safety belt usage and injuries/fatalities when only the driver of a vehicle is taken into consideration.

2. In most cases, there is knowledge of the seat belt usage for fatality occupants in motor crashes; the seat belt usage in injury and property-damage-only crashes remains unknown to a large extent. Fatalities and severe injuries are likely to be a better indicator because the investigating officer is able to determine if a safety belt was used.

3. Although we may expect an increase in observed seat belt usage in fatal crashes as seat belt usage by all drivers' increases, other factors, such as alcohol and speed, may confound this correlation. Changes in these risk factors will affect the observed percentage of seat belt use in fatal crashes. An analysis of Louisiana crash data shows that if seat belt usage were to increase by 1%, assuming that other factors remain unchanged, we would expect a yearly reduction of eight driver fatalities for Louisiana as a whole. This calculation assumes that wearing a seat belt and getting in a fatal crash are independent events. However, there are well-known risk factors in fatal crashes such as alcohol, age and gender, which may also be correlated with not wearing a seat belt. Louisiana crash data analyses show, for instance, that seat belt usage increases with age and many drivers that have been drinking do not wear a seat belt. For this reason, an increase in seat belt use in the general population does not necessarily lead to the expected reduction in fatalities.

4. It is impossible to calculate the percentage of injured occupants for Louisiana crashes because the total number of occupants in property-damage-only crashes is not available.

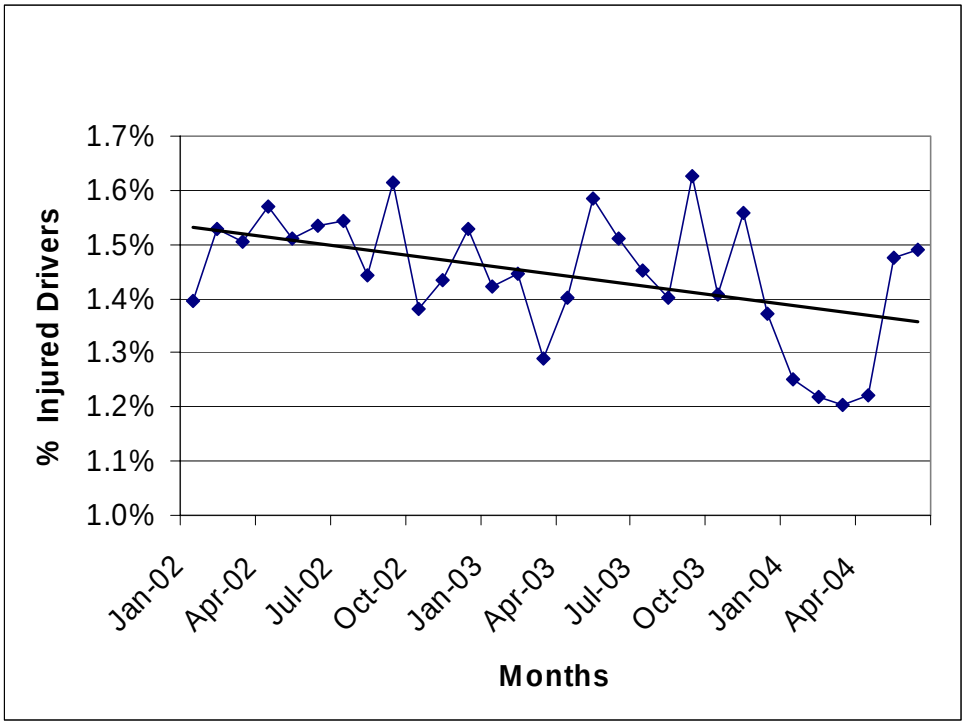
5. Observational surveys are conducted during daytime hours. However, an increase in safety belt use during daytime hours may not reflect the same increase during nighttime hours when most fatal crashes occur.

Because of the described difficulties in modeling the relationship between safety belt use and injury/fatality rate, we will provide various approaches to analyzing the crash data.

Trend in Injuries

Louisiana's crash report uses the following injury severity codes: fatal, severe, moderate and complaint. Figure 4 displays the percentages of fatal, moderate or severely injured drivers in all daytime (6am-6pm) crashes by month. The injury percentage declined from an average of 1.46% in 2002/2003 to 1.35% in 2003/2004, providing evidence of the effect of increased safety belt usage.

Figure 4: Percentage of Fatal, Severely or Moderately Injured Drivers in all Daytime Crashes by Month



Trend in Injuries and Fatalities in Rollover Crashes

One particularly important type of crash where safety belt use has proven to be an important factor in injury severity will be studied to detect trends. Our hypothesis is that since the safety belt usage increased by 5.2% from 2002 to 2003, there should be an increase in observed safety belt usage in rollover crashes and thus a reduction in fatalities and severe injuries. Table 6 depicts the number of rollover crashes from 2000 to 2003. Since the observational survey showed that the seat belt usage rate remained constant during 2000-

2002, the average for these three years will serve as a baseline. We will compare the 2003 results with this baseline. Results for 2004 are not available at this time.

The average number of vehicles rolling over during the 2000-2002 period was 2674 compared with 2940 in 2003, an increase of 266 in the number of drivers at risk of injury. Seat belt usage was not known in many cases. For those cases where seat belt usage was known, there was an increase of 269 for known “to be used” and a decline of 23 for known “not to be used”. The percentage of “no-seat belt-use” had declined by 2.3% from an average of 17.2% to an average of 14.9%. The standard error was 0.7%, indicating that this decline of 2.3% was significant. From the observational survey, we would have expected a decline of more than twice this value because we had observed a decline of greater than 5%. However, as we discussed earlier, certain risk factors such as alcohol, age, and gender play a role in crashes and these risk factors are related to the likelihood of wearing a seat belt, i.e., drunk drivers, youth, and males are less likely to wear a seat belt and represent a higher proportion in rollover crashes. We will have a closer look at these factors later on in this report.

Table 6: Rollover Crashes

Fatal & Severe Injuries								
	None used			Used				
Year	%	Num	Total	%	Num	Total	All	% No Seat Belt
2000	25%	111	443	2%	19	1237	2626	16.9%
2001	20%	89	456	2%	20	1205	2557	17.8%
2002	17%	82	480	3%	36	1299	2840	16.9%
Average	20%	94	460	2%	25	1247	2674	17.2%
STDERR	1.9%	15	19	0.4%	10	48	148	0.7%
2003	27%	117	437	2%	34	1503	2940	14.9%
Diff Average-2003	6.3%	23	-23	0.3%	9	256	266	-2.3%
Fatal								
	None used			Used				
Year	%	Num	Total	%	Num	Total	All	% No Seat Belt
2000	15%	68	443	0.3%	4	1237	2626	16.9%
2001	12%	53	456	0.5%	6	1205	2557	17.8%
2002	11%	55	480	0.7%	9	1299	2840	16.9%
Average	13%	59	460	0.5%	6	1247	2674	17.2%
STDERR	1.6%	8	19	0.2%	3	48	148	0.7%
2003	19%	81	437	0.8%	12	1503	2940	14.9%
Diff Average-2003	5.8%	22	-23	0.3%	6	256	266	-2.3%

Table 6 also shows the risk of being killed in rollover crashes when not wearing a seat belt. For instance, of those drivers not wearing a seat belt, 20% were killed or severely injured in rollover crashes. This percentage is 2% for drivers wearing a seat belt. In rollover crashes,

13% of drivers not wearing a seat belt were killed compared to 0.5% for drivers wearing a seat belt. Hence, if the number of drivers in rollover crashes and the percentage of drivers killed or injured had been constant at 20%, we should have seen a reduction of driver fatalities in rollover crashes of about 8 and driver injuries of about 5. Unfortunately, as Table 6 shows the total number of drivers killed and severely injured in rollover crashes increased in 2003 compared to the average of 2000-2002. The reason for this is that the number of drivers in rollover crashes increased by 266 and the percentage of drivers killed who were not wearing a seat belt increased from 13% to 19%. The increase of the number of rollover crashes may be related to the increase in SUV and pickup trucks in rollover crashes. While the number of cars in rollover crashes has increased by 10% from 2000-2002 to 2003, the number of SUV/Pickup trucks in rollover crashes has increased by 19%. The increase in the percentage of deaths (13% to 19%) of those drivers not wearing a seat belt in rollover crashes may be due to other factors such as alcohol or time of day which will be discussed below.

Nighttime versus Daytime Rollover Crashes

We return to the above-mentioned risk factors contributing to a lower than expected decline in fatalities and injuries. Table 7 depicts the rollover statistics for nighttime crashes and Table 8 depicts the rollover crashes for daytime crashes. There are two important conclusions which can be drawn from the comparison of the crashes for the different 12 hour periods. First, seat belt use is much less frequent in nighttime rollover crashes than in daytime rollover crashes. At night, on the average, 20.5% of the drivers in rollover crashes do not wear a seat belt. During the day, this percentage is 13.8. Second, when we compare 2000-2002 statistics with 2003 statistics, we can detect no significant increase in seat belt use during the night (0.7%, i.e., 19.7% versus 20.5%), but we observe a large decrease in no-seat-belt usage during the day (-3.6%, i.e., 13.8% to 10.2%).

Table 7: Rollover Crashes at Night (6pm-6am)

Fatal & Severe Injuries - Nighttime								
	None used			Used				
	%	Num	Total	%	Num	Total	All	% No Seat Belt
2000	29%	78	267	2%	10	518	1295	20.6%
2001	22%	61	276	2%	9	570	1345	20.5%
2002	19%	55	293	2%	14	584	1448	20.2%
Average	23%	65	279	2%	11	557	1363	20.5%
STDERR	2.5%	12	13	0.6%	3	35	78	1.1%
2003	30%	84	284	2%	14	652	1440	19.7%
Diff Average-2003	6.4%	19	5	0.2%	3	95	77	-0.7%
Fatal - Nighttime								
	None used			Used				
	%	Num	Total	%	Num	Total	All	% No Seat Belt
2000	19%	52	267	0.6%	3	518	1295	20.6%
2001	12%	34	276	0.5%	3	570	1345	20.5%
2002	12%	34	293	0.3%	2	584	1448	20.2%
Average	14%	40	279	0.5%	3	557	1363	20.5%
STDERR	2.1%	10	13	0.3%	1	35	78	1.1%
2003	21%	59	284	1%	6	652	1440	19.7%
Diff Average-2003	6.4%	19	5	0.4%	3	95	77	-0.7%

Table 8: Rollover Crashes during the Day (6am-6pm)

Fatal & Severe Injuries - Daytime								
	None used			Used				
	%	Num	Total	%	Num	Total	All	% No Seat Belt
2000	19%	33	176	1%	9	719	1331	13.2%
2001	16%	28	180	2%	11	635	1212	14.9%
2002	14%	27	187	3%	22	715	1392	13.4%
Average	16%	29	181	2%	14	690	1312	13.8%
STDERR	2.7%	3	6	0.5%	7	47	92	1.0%
2003	14%	22	153	1%	6	851	1500	10.2%
Diff Average-2003	-1.8%	-7	-28	-1.3%	-8	161	188	-3.6%
Fatal - Daytime								
	None used			Used				
	Fatal			Fatal				
	%	Num	Total	%	Num	Total	All	% No Seat Belt
2000	9%	16	176	0.6%	1	719	1331	13.2%
2001	11%	19	180	0.5%	3	635	1212	14.9%
2002	11%	21	187	0.3%	7	715	1392	13.4%
Average	10%	19	181	0.5%	4	690	1312	13.8%
STDERR	2.3%	3	6	0.3%	3	47	92	1.0%
2003	14%	22	153	0.9%	6	851	1500	10.2%
Diff Average-2003	4.1%	3	-28	0.4%	2	161	188	-3.6%

It is also evident from the comparison of day and nighttime rollover crashes that the risk of being killed or severely injured when not wearing a seat belt in a rollover crash is considerably higher during the night than during the day (23% during the night versus 16% during the day). It is interesting to note that the risk of being killed or severely injured in a rollover crash when wearing a seat belt is not much different between night and day time crashes. This finding suggests that other factors are responsible for the crash being fatal. For instance, in alcohol related rollover crashes at night, 31.5% did not wear a seat belt and of those who did not wear a seat belt, 31% were killed. On the average, 78% of driver fatalities in nighttime rollover crashes are alcohol related.

Earlier we mentioned that we unfortunately did not observe a reduction in fatalities in 2003 because of an increase in the percentage of those drivers who died while not wearing a seat belt, i.e., the risk of being killed in a rollover crash while not wearing a seat belt increased from 2000-2002 to 2003. A closer look at Tables 7 and 8 shows that this increased risk occurred mainly at night (30% versus 23% for fatal & injuries). This same percentage actually declined for daytime crashes from 16% to 14%. While the number of drivers in rollover crashes without seat belts declined by 5%, it increased by 17% for nighttime crashes with alcohol. This

suggests that the increase in driver fatalities in rollover crashes from 2000-2002 to 2003 is largely due to an increase in alcohol-related rollover crashes.

Multi-Car Crashes

In multiple-car crashes, drivers without seat belts have a higher risk of being killed. Table 9 depicts the percentage of drivers killed in multiple fatal crashes. Over 75 percent of drivers without a seat belt in a fatal crash were killed, while only about 30% of drivers wearing a seat belt in a fatal crash were killed. It is difficult to assess the effect of an increase in seat belt use in multiple car crashes because the data in Table 9 are based on fatal crashes only.

Table 9: Percentage of Drivers Killed in Multiple Car Crashes

	% Drivers Killed	
Year	Without Seat belt	With Seat belt
2000	74%	29%
2001	75%	34%
2002	73%	31%
2003	80%	30%

Table 10 shows seat belt use of drivers in fatal multiple car crashes by day and night. Daytime crashes (6am-6pm) showed a much higher seat belt use than nighttime crashes. For instance, in 2003, 67% of drivers in fatal crashes used a seat belt during the daytime while only 49% used a seat belt during the nighttime. We also observed a 2.3% increase in seat belt use in 2003 compared to 2000-2002.

Table 10: Seat Belt Use in Fatal Multiple Car Crashes

		All			Killed		Severe Injured		All	
Time	Year	Count	No Seat Belt	With Seat Belt	No Seat Belt	With Seat Belt	No Seat Belt	With Seat Belt	No Seat Belt	With Seat Belt
Day	2000	501	151	271	106	83	8	10	36%	64%
	2001	510	153	273	113	96	4	13	36%	64%
	2002	559	164	325	108	99	14	20	34%	66%
	2003	478	138	284	107	96	7	17	33%	67%
Night	2000	557	261	193	198	52	23	10	57%	43%
	2001	556	237	219	179	71	15	9	52%	48%
	2002	503	206	211	162	51	10	9	49%	51%
	2003	493	223	214	180	55	9	7	51%	49%

There is considerable evidence that seat belt programs increase seat belt usage during the day (6am-6pm). Nighttime usage is difficult to measure. However, crash data suggest that nighttime usage is not only considerably lower than daytime usage, but also the seat belt programs are less effective for nighttime drivers, specifically high-risk drivers. If all drivers during daytime hours were to wear a seat belt, about 74 lives could be saved each year. This is about 2.5 lives for every percentage point seat belt use increase. If all drivers during nighttime hours crashes were to wear a seat belt, about 125 lives could be saved each year. This is only about 2.5 lives for every percentage point seat belt use increase as well because of the lower seat belt usage at night. Overall, 5 drivers could be saved for every percentage point seat belt use increase. An additional 3 passengers could be saved per one percentage point increase in seat belt usage of occupants.

VI. Conclusion

As demonstrated in earlier projects, enhanced enforcement with appropriate media coverage leads to a reduction in fatalities and injuries. This report shows that injuries continued to decline between October 2003 and September 2004. It is too early to conclude if fatalities have declined significantly in 2004. However, the following conclusions can be drawn:

- The enhanced enforcement and media campaigns have had an affect on safety belt usage during daytime hours (6am-6pm).
- The programs have had less of an effect on safety-belt usage during nighttime hours.

The following recommendations may serve as guidelines for future projects. In order to obtain an optimal effect from limited available funds, the funding for media campaigns and overtime awarded to agencies in parishes should take into account:

- the seat belt usage, fatalities and injuries in the parishes; specifically, increased efforts should be made to encourage the Baton Rouge, Natchitoches and Tangipahoa law enforcement agencies to participate significantly in enhanced enforcement efforts;
- agencies should be encouraged to employ nighttime seat-belt enforcement;
- the effectiveness of the agencies in using the funds; specifically, objective goals should be met such as number of tickets per hour;
- timely filing of reports; reports for August-September are not available yet.

In addition, it is recommended that the deployment of funds for yearlong programs should be monitored continuously to ensure that the funds are used as effectively as possible. In order to be able to monitor the effectiveness of the deployment of funds, the agencies should be required to file a report at the end of each month. To facilitate timely reporting a web application could be written to allow agencies to enter data over the internet. This would not only cut down on the time consuming paperwork which may be lost or misplaced but also allow easy tabulation of data.