STATEWIDE CHILD RESTRAINT SURVEY

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Thomas E. James, Ph.D., Director
Kathy Hall, Assistant Director

Institute for Public Affairs
University of Oklahoma
455 W. Lindsey Street, Room 304
Norman, OK 73019-2002

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EXECUTIVE SUMMARY

This report compares the use of child restraints (car seats and safety belts) in passenger vehicles in Oklahoma over six observation periods: July/August 2002, July/August 2003, May 2004, May 2005, June 2006, and July 2007. Visual observations were made at 100 different locations selected on the basis of geography, population, and urban versus non-urban status. Drivers and child passengers from infants to six year old children were observed to determine proper restraint usage. Twenty-five vehicles carrying children were observed at each of the 100 sites on one specified date per site, yielding a total of 2,500 observations for the state.

Percent Properly Restrained

	2002	2003	2004	2005	2006	2007
Combined	77.4	75.7	80.6	82.7	86.7	85.4
Infants (less than 1 year)	67.3	73.8	65.8	73.4	78.4	82.5
Children (1-6 years)	79.0	75.9	83.0	84.1	87.6	85.7

Overall, the combined percentage of children who were properly restrained increased from 77.4% in 2002 to 85.4% in 2007. Over this six-year period, the protection rate for infants increased from 67.3% to 82.5%, while the percentage of small children who were properly restrained increased from 79.0% to 85.7%. The rates for Oklahoma infants and small children using any type of restraint (car seat, booster seat, seat belt) compare very favorably with the national data. Of those observed in the 2007 Oklahoma study, 97.9% of the infants and 85.7% of the small children were restrained in some way with an overall rate of 87.2%. Data presented in the National Occupant Protection Use Survey for 2006 (Glassbrenner, 2007) indicates that 98.0% of infants, 89.0% of children age 1-3, and 78.0% of 4-7 year olds were restrained in some type of restraint. Nationally the overall restraint rate was 84%.

The National Highway Traffic Safety Administration's (NHTSA) State Data System Analysis published in November 2003 (Kindelberger and Starnes, 2003) reports that since 1995, more children have been placed in the back seat, indicating positive effects of child safety campaigns. Furthermore, infants and children placed in the front seat of vehicles are left unrestrained at a greater rate than their counterparts in the back seat (Glassbrenner, 2007). Oklahoma observations during 2007 support the NHTSA findings with regard to infants as front seat passengers.

A comparison to the 2006 survey results shows an increase in the protection rate for infants from 78.4% to 82.5%, while the protection rate for small children decreased from 87.6% in 2006 to 85.7% in 2007. As in previous years, white children were more likely than non-white children to

be properly restrained in 2007 (86.0% to 82.6%). However, the differences in 2006 and 2007 are much smaller compared to previous years. Children in vehicles observed within urban areas compared to those in non-urban areas were restrained at a slightly lower rate (84.8% to 86.1%). This is the first time that infants and children observed in non-urban areas had a higher percentage properly restrained than those in urban areas. The safety of infants and small children riding in vans was highest with 90.4% properly restrained, followed by 85.8% in automobiles, and 77.2% in pickup trucks.

Substantial differences in restraint rates exist across the regions of the state. Tulsa's surrounding metropolitan area (96.0%) and Tulsa proper (95.5%) had the highest percentage of infants and small children properly restrained. The Southwest Region and Oklahoma City proper had the lowest restraint rates (79.7% and 73.8%, respectively).

Regional Restraint Rates - 2007

Region	Percent Properly Restrained
Tulsa Metro	96.0
Tulsa	95.5
Northeast	90.4
Oklahoma City Metro	85.8
Southeast	84.8
Northwest	81.1
Southwest	79.7
Oklahoma City	73.8

The greatest variation in use of child restraints was found when considering whether or not the driver was belted. Infants and small children are much more likely to be restrained properly when the driver is wearing a seatbelt (93.6%) than when the driver is not belted (39.2%). Infants and children are 2.4 times more likely to be properly restrained when riding in a vehicle with a belted driver compared to those riding with an unbelted driver. NHTSA reviewed data collected from 1991 through 2001 on fatal crashes and found the probability of a child being restrained is 2.1 times greater when the child is with a restrained driver versus being with an unrestrained driver (Starnes, 2003). Similarly, Glassbrenner's (2007) recent report on child restraint use notes that 87% of birth to seven year old children driven by buckled drivers were restrained, compared to 58% for children riding with unbelted drivers.

Percent Properly Restrained by Driver Belted or Not

	Driver Belted	Driver Not Belted
Combined	93.6	39.2
Infants (less than 1 year)	83.2	75.0
Children (1-6 years)	95.0	36.7

The benefits of child restraint use continue to be substantial. The National Highway Traffic Safety Administration notes that over the period 1975 through 2005, an estimated 7,896 lives were saved by child restraints. Among children under the age of five, an estimated 420 lives were saved in 2005 by child restraint use. An estimated 518 lives could have been saved in 2005 if all children less than five had been restrained. Research on child safety seats has found them to reduce fatal injury by 71% for infants and by 54% for toddlers (1-5 years old) in passenger cars. These reductions are 58% and 59%, respectively, for infants and toddlers riding in pickup trucks (NHTSA, 2005).

The 2007 Oklahoma child restraint study shows a very strong connection between drivers' seat belt use and the use of child passenger restraints, reconfirming the conclusions of previous years: education and public awareness of child restraint protections are strongly related. Special attention to pickup truck drivers should be continued as the protection of infants and children riding in pickup trucks remains lower than any other vehicle type (cars, SUVs, Jeeps, or vans).

Although there was a slight decrease in the properly restrained rate from 2006 to 2007, generally, the proportion of infants and small children who are properly restrained continues to increase across the state. In light of the data collected in the 2007 study, our recommendations mirror those of recent years:

- Continue to encourage and support vigorous enforcement of the Child Passenger Restraint Systems Act;
- Collect county-level data on enforcement of the use of passenger belts and child restraint devices to document the relationship between enforcement and restraint use;
- Direct special attention (enforcement and education efforts) toward pickup truck drivers since the protection rate of child passengers riding in pickup trucks remains much lower than the protection rates for any other kind of vehicle;

- Continue to develop and expand statewide public education and awareness programs using NHTSA guidelines – including the use of booster seats, the safety gains realized from putting infants and children in the back seat of vehicles, and the elimination of exemptions;

- Expand child restraint loaner programs, especially for those living in the rural areas of Oklahoma and drivers of pickup trucks – groups that historically have a below average rate of use. This outreach should not be to the exclusion of other groups or areas, since recent gains in usage should be encouraged to continue.

- Promote the use of child restraints within day care centers, doctor offices, hospitals, and faith-based organizations. Proper instruction for parents, grandparents, older siblings, and other care givers of infants and children is especially important.

STATEWIDE CHILD RESTRAINT OBSERVATION STUDY: 2007

INTRODUCTION

This report is the 21th statewide observation study of the use of child restraints by infants (birth to one year) and small children (one to six years of age) in Oklahoma. The study was conducted by the Institute for Public Affairs, University of Oklahoma, under contract with the Oklahoma Highway Safety Office (OHSO). Observations occurred during July 2007.

The Institute for Public Affairs developed the survey instrument (Appendix A) using various sources, including but not limited to the National Highway Traffic Safety Administration's (NHTSA) 1983 *Guidelines for Conducing a Survey of the Use of Safety Belts and Child Safety Seats*, and NHTSA publications, *Are You Using It Right?* (IP0040), and *Child Transportation Safety Tips* (IP0835). The observation survey instrument includes: age of child, race of child, use or non-use of child restraint devices, position child is facing in the vehicle, location of the child in the vehicle, vehicle type, gender of driver, and the driver's use or non-use of a seat belt.

BACKGROUND

In March 1983, the Oklahoma Legislature approved H.B. 1005 which required the use of "a passenger restraint system or a properly secured seat belt for children up to the ages of four or five." The law provided that if a motorist with children was observed to be in violation of the law, a law enforcement officer had the discretion to stop the motorist and give the violator a "verbal warning" on the dangers of non-restraint. The statute granted no enforcement or punitive measures for use by the law enforcement officer.

Amendments to the law in 1987 strengthened the 1983 Child Passenger Restraint System Act by providing penalties and fines for violators who failed to properly protect child passengers in their vehicles. The law was amended again in 2004 (S.B.1224) to increase the age of children from 4 to 6 years of age who are required to be transported using a child restraint system. The 2004 amendments also state that children at least six years of age but younger than 13 years of age shall be protected by the use of a child restraint system or a seat belt.

This study was conducted so as to replicate the previous studies. The basic design for the initial study was a variation on cluster sampling in which a random selection of observation sites was made based on population and geographic distribution. A sufficiently large number of observations were taken to assure a reasonable level of confidence in the results. The methodology employed is included as Appendix B.

The procedure used to select sites in Oklahoma yielded a sample in which non-whites appear to be somewhat under represented. The 2007 sample of 2,500 children contains a racial composition of 80.6% white and 19.4% non-white (Table 1). Observers were instructed to code racial/ethnic groups such as Native Americans, Hispanics, and Asians as "white." In 2005, 21.5% of Oklahoma's population was "non-white." The proportion of those observed who were non-white increased slowly but steadily from 1999 (9.4%) to 2006 (23.2%). The proportion declined somewhat in 2007 to 19.4% non-white. Of the total population, 60.8% resided in a Metropolitan Statistical Area (excluding the Ft. Smith, Arkansas MSA) at the time of the 2005 census update. In the 2007 sample, 62.7% of the observations were drawn from an MSA, including the Oklahoma City metropolitan area, the Tulsa metropolitan area, Lawton and its surrounding communities, and the Enid area.

Table 1 also provides the frequency distributions for other sample characteristics from the 2002 to 2007 surveys. The proportion of infants observed relative to small children is up slightly compared to most of the previous year, but lower than 2002, 2004, and 2005. As in past years, the preponderance of vehicles observed were automobiles (74.0%). Of the drivers, 84.9% were belted.

TABLE 1

Frequency Distribution of Sample Characteristics, 2002-2007

CHARACTERISTIC						
Race (N=2,500)	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
White	86.6	83.8	79.9	77.3	76.8	80.6
Non-white	13.4	16.2	20.1	22.7	23.2	19.4
Age (N=2,500)						
Infants (Birth - 1 year)	14.0	8.8	14.2	13.1	9.4	11.0
Children (1-6 years)	86.0	91.2	85.8	86.9	90.6	89.0
Type of Restraint (N=2,500)						
Car Seat	52.4	41.6	52.1	39.6	43.2	38.1
Seat Belt	29.0	35.9	32.8	46.0	45.2	49.1
No Restraint	18.5	22.5	15.2	14.3	11.6	12.8
Type of Vehicle (N=2,500)						
Automobile*	69.1	67.7	71.3	69.8	71.8	74.0
Pickup	12.0	11.8	12.0	11.4	11.4	12.6
Van	18.9	20.6	16.7	18.7	16.8	13.3
Driver (N=2,500)						
Belted	71.6	75.2	80.1	80.4	87.5	84.9
Not Belted	28.4	24.8	19.9	19.6	12.5	15.1

*SUVs, Jeeps, and cars are included within the automobile category for analysis.

ANALYSIS OF STATEWIDE CHILD RESTRAINT USE

The analysis in this section presents child restraint use for the state as a whole for both infants (birth to one year) and small children (from one to six years of age), then separately for infants and small children during six separate time periods (from 2002 to 2007). The remainder of the data are presented as combined ages to permit easier comparisons by regions within the state and to facilitate comparisons of Oklahoma data with national usage rates.

As indicated in Table 2, the proportion of children observed in 2007 who were restrained properly and improperly (87.2%) and those who were properly restrained (85.4%) decreased slightly compared to 2006 (1.2 and 1.3 percentage points, respectively). Of those infants and children restrained in either a car seat or belt (proper and improper), 97.9% were restrained properly. Data presented in the National Occupant Protection Use Survey for 2006 (Glassbrenner, 2007) indicates that 98% of infants, 89% of children age 1-3, and 78% of 4-7 year olds were restrained in some type of restraint. Nationally the overall restraint rate was 84%. Of those observed in the 2007 Oklahoma study, 98.9% of the infants and 85.7% of the small children were restrained (properly and improperly). The rates for Oklahoma compare very favorably with the national data.

Proper restraint rates across categories are better understood from a long-term perspective rather than a simple comparison to the previous year. As shown in Table 2, the rate of infants and small children who were properly restrained increased substantially from 2002 to 2007. Specifically, 85.4% of the total sampled infants and children in 2007 were properly restrained as compared with 77.4% in 2002, an overall increase of 8.0 percentage points.

Generally, small children have been more likely to be properly restrained than infants and the same pattern is evident in 2007 with 85.7% of small children properly restrained compared to 82.5% of infants. Over the past six years, the protection rate of small children has increased by 6.7 percentage points, while the protection rate of infants has increased by 15.2 percentage points.

The percent properly restrained decreased in 2007 for all children combined. This decline was mirrored in both white infants and children combined and non-while infants and children combined. As in previous years (Table 2) white children combined were more likely than non-white children to be properly restrained in 2007 (86.0% to 82.6%). However, the differences between white and non-white rates in 2006 and 2007 are much smaller compared to previous years. The protection rates for white and non-white children have increased by 8.0 and 9.2 percentage points, respectively, from 2002 to 2007.

TABLE 2

Child Restraint Use, 2002-2007

Percent Restrained

Restrained (N=2,500)	2002	2003	2004	2005	2006	2007	Change 2006-2007
Restrained (proper and improper)	81.5	77.5	84.8	85.7	88.4	87.2	-1.2
Properly Restrained	77.4	75.7	80.6	82.7	86.7	85.4	-1.3
Properly Restrained as a Percent of Restrained (proper and improper)	94.9	97.7	95.0	96.5	97.6	97.9	+0.3
Not Restrained	18.5	22.5	15.2	14.3	11.6	12.8	+1.2

Percent Properly Restrained

	2002	2003	2004	2005	2006	2007	Change 2006-2007
Infants/Children							
Infants	67.3*	73.8	65.8*	73.4*	78.4*	82.5 (N=226)	+4.1
Children	79.0*	75.9	83.0*	84.1*	87.6*	85.7 (N=1,908)	-1.9
Combined	77.4	75.7	80.6	82.7	86.7	85.4 (N=2,134)	-1.3
Race							
White	78.0	76.7*	82.1*	84.9*	87.3	86.0* (N=1,714)	-1.3
Non-white	73.4	70.4*	74.0*	74.5*	84.7	82.6* (N=395)	-2.1
Metropolitan Area							
Metropolitan**	84.6*	75.7	82.9*	85.4*	89.4*	84.8 (N=1,208)	-4.6
Non-metropolitan	67.7*	75.6	77.5*	79.1*	83.2*	86.1 (N=926)	+2.9

*Differences are statistically significant at the .05 level using a two-tailed chi-square test. The tests of significance are calculated within each observation period, not across periods. Thus, the differences between white and non-white children for 2007 are statistically significant at the .05 level.

**Metropolitan areas include Oklahoma City, Oklahoma City Metro, Tulsa, Tulsa Metro, Enid, and Lawton.

The 2007 study once again indicated a difference in child protection when observations at the 100 sites were analyzed by comparing those observed in Metropolitan Statistical Areas (MSAs) (84.8% protected) to those in non-MSAs (86.1%). This is the first time that infants and children observed in non-urban areas had a higher percentage properly restrained than those in urban areas. According to the census bureau, MSAs are made up of cities with 50,000 or more in population and include counties that are economically dependent on those central cities. The four MSAs include Oklahoma City proper combined with its outlying metropolitan areas, Tulsa proper combined with its outlying metropolitan areas, Enid along with the surrounding area of Garfield County, and Lawton including the surrounding area of Comanche County. The MSA protection rate for 2007 was lower than the protection rate in 2006, resulting in a decrease of 4.6 percentage points. Since 2002, the overall increase in protection rates of children residing in an MSA is 0.2 percentage points. The protection rate in non-MSAs has improved substantially over the last six years (18.4 percentage points), including a 2.9 percentage point improvement from 2006 to 2007.

As noted previously, of the 2500 drivers observed, 84.9% were belted. Table 3 shows the dramatic difference in child restraint use when the driver of the vehicle is using a safety belt. Overall, 93.6% of the infants and children riding with a belted driver were properly restrained with only 39.2% of the infants and children properly restrained when riding with a driver who was not using a safety belt. When infants and children are combined, there has been an increase of 4.8 percentage points between 2002-2007 when riding with a belted driver. The percentage of properly restrained infants (with a belted driver) has increased substantially (68.1% in 2002 to 83.2% in 2007), while proper restraint rates of small children have increased by 2.4 percentage points. When the driver was not belted, 36.7% of small children were properly restrained in 2007 (a 10.3 percentage point decrease since 2002), and 75.0% of infants were properly restrained (an increase of 10.8 percentage points since 2002). The combined proper restraint rate when the driver was not belted was 39.2% in 2007, which is a decrease of 9.5 percentage points since 2002.

In comparison to the 2006 results, the 2007 survey reflects a slight overall increase of 1.4 percentage points (92.2% to 93.6%) for properly restrained infants and small children in vehicles in which a driver was using a safety belt. Infants were properly restrained at a somewhat higher rate in 2007 compared to 2006 (83.2% and 79.8%, respectively). The percentage of small children who were protected increased from 93.6% in 2006 to 95.9% in 2007.

When the driver was not belted, there was a decrease in proper restraint use of 9.0 percentage points (48.2% to 39.2%) from 2006 among all children observed. The percentage of small children who were properly restrained decreased from 2006 to 2007 by 10.8 percentage points (47.5% to 36.7%), while protected infants experienced a substantial increase (13.9 percentage points – 61.1% to 75.0%). However, it should be noted that the restrained rate for infants and children in vehicles with an unbelted driver was very low in 2006 and only 18 infants were observed with unbelted drivers. The important conclusion from the analysis of these data is the fact that a very strong relationship exists between the driver's use of a seat belt and the proper restraint of children overall. *If the driver is buckled up, children are **2.4 times more likely to be protected** as compared to children riding with unbelted drivers (93.6% versus 39.2%).*

TABLE 3

Child Restraint Use By Whether or Not the Driver is Belted, 2002-2007

	Percent Properly Restrained						
Driver Belted	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**Change 2006-2007**
Infants	68.1*	78.3	68.6*	80.4*	79.8*	83.2* (N=208)	+3.4
Children	92.6*	85.8	94.8*	96.2*	93.6*	95.0* (N=1,778)	+1.4
Combined	88.8	85.0	90.8	94.1	92.2	93.6 (N=1,986)	+1.4
Driver Not Belted							
Infants	64.2*	51.4	49.0*	37.3	61.1	75.0* (N=18)	+13.9
Children	47.0*	47.1	38.3*	36.3	47.5	36.7* (N=130)	-10.8
Combined	48.7	47.3	39.4	36.4	48.2	39.2* (N=148)	-9.0

*Differences are statistically significant at the .05 level using a two-tailed chi-square test. The tests of significance are calculated within each observation period, not across periods. For example, the difference between infants and small children riding with belted drivers for 2007 is statistically significant at the .05 level.

As in the past, the 2007 study recorded the type of vehicle observed. Vehicles were categorized as automobiles (74.0% of the observations), pickup trucks (12.6%), or vans (13.3%). Table 4 profiles the differences between the protection rate of infants and small children based on the type of vehicle driven. Like most previous years, the combined rate for children properly restrained was the highest for vans. Infants and children riding in vans had a combined properly restrained rate of 90.4% (a 6.1 percentage point increase from 2002), while 85.8% of infants and children riding in automobiles were properly restrained (a 7.8 percentage point increase from 2002). Combined protection rates in pickup trucks continued to be the lowest at 77.2% (a 14.4 percentage point increase from 2002).

In comparison to the 2006 results, the combined rate of proper restraint decreased for all types of vehicles. The percentage of those riding in automobiles who were properly restrained experienced a very small decrease from 86.2% to 85.8% (0.4 percentage points). Infants and children properly restrained decreased when riding in pickup trucks (80.4% to 77.2%) and vans (93.1% to 90.4%) by 3.2 and 2.7 percentage points, respectively.

TABLE 4

Child Restraint Use By Type of Vehicle, 2002-2007

Percent Properly Restrained

Automobiles	2002	2003	2004	2005	2006	2007	Change 2006-2007
Infants	69.0*	75.9	66.1*	78.4*	75.9*	85.4 (N=181)	+9.5
Children	79.6*	76.9	83.0*	86.4*	87.3*	85.9 (N=1,408)	-1.4
Combined	78.0	76.8	80.4*	85.3	86.2	85.8 (N=1,589)	-0.4
Pickup Trucks							
Infants	65.0	52.9	58.8*	58.8	79.2	45.8* (N=11)	-33.4
Children	62.6	68.2	73.6*	65.9	80.5	79.8* (N=233)	-0.7
Combined	62.8	67.3	71.9	65.0	80.4	77.2 (N=244)	-3.2
Vans							
Infants	62.0*	73.9	69.8*	61.4*	86.0*	89.5 (N=34)	+3.5
Children	88.3*	76.9	89.6*	86.9*	94.1*	90.5 (N=267)	-3.6
Combined	84.3	76.7	87.6	83.8	93.1	90.4 (N=301)	-2.7

*Differences are statistically significant at the .05 level using a two-tailed chi-square test. The tests of significance are calculated within each observation period, not across periods. In this table, comparisons are within the categories "automobiles"(includes SUVs and Jeeps), "pickup trucks," and "vans." For example, the difference between infants and small children riding in pickup trucks is significant at the .05 level.

When infants alone are considered, those riding in automobiles typically lead the way. However, this year (as in 2006), infants riding in vans had the highest properly restrained rate (89.5%), a 27.5 percentage point increase from 2002 and a 3.5 percentage point increase over 2006. The protection rate of infants riding in pickup trucks decreased substantially to 45.8%. This was a decrease of 33.4 percentage points from 2006 and followed a 20.4 point increase 2005 to 2006. The infants riding in automobiles had properly restrained rate 85.4%, an increase from 2002 of 16.4 percentage points and a 9.5 percentage point increase over 2006.

Of the small children observed in 2007, 90.5% of those in vans were properly restrained; a 2.2 percentage point increase since 2002 and a 3.6 point decrease compared to 2006. There was a 6.3 percentage point increase among small children properly restrained in automobiles compared to 2002 (79.6% to 85.9%) and a slight decrease of 1.4 percentage points compared to the previous year. The number of small children properly restrained in pickup trucks has increased by 17.2 percentage points since 2002 (from 62.6% to 79.8%) and decreased by 0.7 points from 2006. Although the use of child restraint systems in pickup trucks has increased significantly, it still remains lower than restraint use in automobiles and especially, vans.

ANALYSIS OF CHILD RESTRAINT USE BY REGION

For the purposes of this study, the state was divided into four geographical regions, excluding the Oklahoma City and Tulsa areas. These regions include the Northwest (generally west of I-35 and north of I-40), Northeast (east of I-35 and north of I-40), Southwest (west of I-35 and south of I-40), and Southeast (east of I-35 and south of I-40). These four regions were analyzed as mutually exclusive units and compared to the state average. In addition to the four broad geographic regions, Tables 5 and 6 include four other comparisons – Oklahoma City proper, the metropolitan area surrounding Oklahoma City, Tulsa proper, and the metropolitan area around Tulsa.

Table 5 displays child restraint use by region from 2002 to 2007. In the current study, the highest rate of child restraint use was found in Tulsa metropolitan area (96.0%), an increase of 8.6 percentage points over the 2006 rate. The second highest protection rate was observed in Tulsa proper (95.5%), a 9.4 percentage point increase from 2006. The Northeast Region was next with 90.4%, followed by the Oklahoma City metro area (85.8%), the Southeast Region (84.8%), the Northwest Region (81.1%), the Southwest Region (79.7%), and finally, Oklahoma City proper (73.8%).

Statewide the percentage of properly restrained children decreased by 4.4 percentage points from 2006 to 2007 (86.7% to 85.4%). Five of the eight geographic regions decreased the rate of those properly restrained in 2007, led by an 18.2 percentage point decrease in Oklahoma City proper and an 8.7 point decrease in the Oklahoma City metro area. Small decreases in child restraint usage were noted in Northwest, Southeast, and Southwest Regions (4.6, 1.6, and 1.4 percentage point decreases, respectively). However, even after the decreases, the restraint rates in most of these areas remain relatively high.

When considering changes in statewide child protection rates from 2002 to 2007, the percentage of both infants and small children properly restrained has increased by 8.0 percentage points. Only Oklahoma City proper experienced a decline in the properly restrained rate from 2002 to 2007 (81.1% to 73.8%) The Oklahoma City metro area rate in 2007 (85.8%) was only 0.7 of a percentage point higher than the rate in 2002 (85.1%). The Southeast Region has seen the greatest overall increase in proper restraint use since 2002 (32 percentage points). The remaining areas had increased restraint usage ranging from 4.6 to 14.9 percentage points.

TABLE 5

Child Restraint Use By Region (Combined Ages), 2002-2007

Region	Percent Properly Restrained						Change 2006-2007
	2002	2003	2004	2005	2006	2007	
Statewide, Combined Areas	77.4	75.7	80.6	82.7	86.7	85.4	-1.3
Oklahoma City	81.1	75.3	85.6	79.3	92.0	73.8	-18.2
Oklahoma City Metro	85.1	92.4	84.0	90.9	94.5	85.8	-8.7
Tulsa	90.9	64.3	83.7	88.5	86.1	95.5	+9.4
Tulsa Metro	81.1	68.0	76.6	89.7	87.4	96.0	+8.6
Northeast Region	76.7	78.7	87.3	83.3	81.8	90.4	+8.6
Northwest Region	69.1	76.6	77.1	77.1	85.7	81.1	-4.6
Southeast Region	52.8	68.0	64.0	71.6	86.4	84.8	-1.6
Southwest Region	72.6	80.3	74.9	80.6	81.1	79.7	-1.4
Total Oklahoma City, OKC Metro, Tulsa, and Tulsa Metro	84.8	74.7	83.5	86.0	90.2	85.8	-1.4

Although it is useful to compare data from year to year and across several years, as shown in Table 5, there are some problems with this type of analysis. Specifically, it gives weight to year-to-year fluctuations in the data. For example, the child restraint usage in Oklahoma City for 2002 was 81.1%, restraint decreased in 2003 to 75.3%, increased 85.6% in 2004, decreased again in 2005 to 79.3%, increased in 2006 to 92.0% and then decreased substantially to 73.8% this year. Other areas exhibit swings back and forth from year-to-year with positive and negative changes in rates compared to previous years. In order to help compensate for year-to-year swings in the data, an analysis was conducted using three-year rolling averages from 2002-2004 to 2005-2007 (Table 6). Averaging data over several years helps smooth out the inter-annual fluctuations.

TABLE 6

Child Restraint Use By Region (Rolling Averages), 2002-2004 to 2005-2007

Areas Observed	2002-2004	2003-2005	2004-2006	2005-2007	Change 2002-2004 to 2005-2007
Statewide, Combined Areas	77.9	79.7	83.6	84.9	+7.0
Oklahoma City	80.7	80.1	85.6	81.7	+1.0
Oklahoma City Metro	87.2	89.1	89.8	90.4	+3.2
Tulsa	79.6	78.8	86.1	90.0	+10.4
Tulsa Metro	75.2	78.1	84.6	91.0	+15.8
Northeast Region	80.9	83.1	84.1	85.2	+4.3
Northwest Region	74.3	76.9	80.0	81.3	+7.0
Southeast Region	61.6	67.9	74.0	80.9	+19.3
Southwest Region	75.9	78.6	78.9	80.5	+4.6
Total Oklahoma City, OKC Metro, Tulsa, and Tulsa Metro areas	81.0	81.4	86.6	87.3	+6.3

Based on the rolling averages, the statewide rate of properly restrained infants and small children has increased 7.0 percentage points from 2002-2004 to 2005-2007 (77.9% to 84.9%). Furthermore, the rates of those properly restrained have increased in all of the geographic areas over this six-year period when using the rolling averages. The largest increases have taken place in the Southeast Region (19.3 percentage points), the Tulsa metro area (15.8 percentage points), and Tulsa proper (10.4 percentage points). The other areas had increase ranging from 1.0 percentage points to 7.0 points.

CONCLUSIONS AND RECOMMENDATIONS

The results of the 2007 survey can be summarized as follows:

- The combined (infants and small children from birth to age 6) statewide rate for proper child restraint use was 85.4% (down 1.3 percentage points from 2006 and up 8.0 percentage points since 2002).

- The percentage of infants and small children not restrained at all in 2007 was 12.8% (up from 11.6% in 2006 and down from 18.5% in 2002).

- Infants (birth to one year) were properly restrained at a rate of 82.5% (up from 78.4% in 2006 and up 15.2 percentage points since 2002).

- Small children (age 1-6 years) were properly restrained at a rate of 85.7% (down from 87.6% in 2006 and up 6.7 percentage points since 2002).

- Restraint use among infants and children observed in MSAs (84.8%) was somewhat lower than those observed in non-MSAs (86.1%). This is the first time that non-MSA observations had a higher restraint rate than observations in MSAs.

- White infants and small children continued to experience a somewhat greater rate of protection (86.0%) than non-white children (82.6%). However, the difference in 2006 and 2007 is smaller compared to previous years.

- Infants and small children traveling in vans and automobiles were more likely to be properly restrained (90.4% and 85.8%, respectively) than those riding in pickup trucks (77.2%).

- The most striking distinction was in the difference between the safety of infants and small children riding in vehicles when the driver was using a seat belt (93.6% of children properly restrained) and the safety of infants and small children in vehicles when the driver was not belted (39.2% of children properly restrained)–a 54.4 percentage point difference. As in previous years, the more likely a driver is to buckle up, the greater the likelihood that any child passenger also will be restrained.

- When comparing geographic regions, since 2002 the Southeast Region, Tulsa metro area, the Northeast Region, and the Northwest Region have experienced the highest increase of child restraint use (a 32.0, a 14.9, a 13.7, and a 12.0 percentage point increases, respectively).

- When examining three-year rolling averages from 2002-2004 to 2005-2007, all geographic areas have seen an increase in the rate of proper restraint. The largest increases have been in the Southeast Region (19.3 percentage points), the Tulsa metro area (15.8 points), and Tulsa proper (10.4 percentage points).

The benefits of child restraint use continue to be substantial. The National Highway Traffic Safety Administration notes that over the period 1975 through 2005, an estimated 7,896 lives were saved by child restraints. Among children under the age of five, an estimated 420 lives were saved in 2005 by child restraint use. An estimated 518 lives could have been saved in 2005 if all children less than five had been restrained. Research on child safety seats has found them to reduce fatal injury by 71% for infants and by 54% for toddlers (1-5 years old) in passenger cars. These reductions are 58% and 59%, respectively, for infants and toddlers riding in pickup trucks (NHTSA, 2005).

The Oklahoma Department of Public Safety's Highway Safety Office (2006) notes in its *2005 Oklahoma Crash Facts* report that there were 13 fatalities of children age seven and under in passenger vehicles and pickup trucks in 2005. Of the eight fatality victims age five and under in passenger vehicles and pickup trucks, seven (87.5%) were not in child restraints. Of the 1,251 vehicle crash injuries that occurred to children age six and under during 2003, 15.2% were completely unrestrained (ODPS, 2004).

The proportion of infants and small children who are properly restrained continues to increase across the state. In light of the data collected in the 2007 study, our recommendations mirror those of recent years:

- Continue to encourage and support *vigorous* enforcement of penalties for noncompliance with the Child Passenger Restraint System Act;

- Collect county-level data on enforcement of the use of passenger belts and child restraint devices to document the relationship between enforcement and restraint use;

- Direct special attention (enforcement and education efforts) toward pickup truck drivers since the protection rate of child passengers riding in pickup trucks remains much lower than for any other kind of vehicle;

- Continue to develop and expand statewide public education and awareness programs using guidelines proposed by NHTSA, by encouraging the use of booster seats for older children, the placing infants and small children in the back seat of all vehicles, and the elimination of exemptions;

- Expand child car seat loaner programs and car seat checkpoints, especially for those living in the rural areas of Oklahoma and drivers of pickup trucks – groups that historically have a below average rate of use. This outreach should not be to the exclusion of other groups or areas, since recent gains in usage should be encouraged to continue; and

- Promote the use of child restraints in identified populations where the highest percentage of young children and their parents are located. This would likely include day care centers, doctor offices, hospitals, and faith-based organizations. Proper instructions for parents, grandparents, older siblings, and other care givers of infants and small children are especially important.

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APPENDIX A

Oklahoma Child Restraint Observation Form, July 2007

Oklahoma Child Restraint Observation Form

Observer: _____ **Location: _____**

If location changed - indicate where you were when you observed - and if you moved during the observation period to another location - indicate that below, in addition to identifying the # of the observation in which you relocated.

Observation Date: _____

Site ID#:_____

After 1 hour, I changed location to: _____which is within 1 mile of the original site locale.

Start Time: _____ **End Time _____**

NOTES: _____

	INFANT OR CHILD					DRIVER		
	Child's Age **I=Infant (up to 1yr.)** **C=Child (+1-6 yrs. old)**	**Child's Race** **W=White** **N=Non-white** **U=Unsure**	**Location of Child** **F=Front** **B=Back**	**Child Protection** **S=Car Seat** **B=Belted** **N=No Protection**	**Child Facing** **F=Front** **B=Back**	**Vehicle** **C=Car** **P=Pickup** **S=SUV/Jeep** **V=Van**	**Gender** **M=Male** **F=Female** **U=Unsure**	**Belted?** **Y=Yes** **N=No**
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								

	INFANT OR CHILD					DRIVER		
	Age **I=Infant (up to 1year)** **C=Child (+1-6 yrs. old)**	**Child's Race** **W=White** **N=Non-white** **U=Unsure**	**Location of Child** **F=Front** **B=Back**	**Child Protection** **S=Car seat** **B=Belted** **N=No Protection**	**Child Facing** **F=Front** **B=Back**	**Vehicle** **C=Car** **P=Pickup** **S=SUV/Jeep** **V=Van**	**Gender** **M=Male** **F=Female** **U=Unsure**	**Belted?** **Y=Yes** **N=No**
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								

Please add any comments, corrections, or additional observation dates (including start and end times) if applicable:

APPENDIX B

Methodology

APPENDIX B
METHODOLOGY

The methodology employed to conduct the child restraint survey was based on several considerations:

- The approach followed should conform to NHTSA recommendations described in the 1983 Guidelines for Conducting a Survey of the Use of Safety Belts and Child Safety Seats.

- Only privately-owned passenger vehicles (including vans and pickups) were observed, consistent with the requirements of the state law.

- Only children covered under 47 O.S. Supp. 2004 § 11-1112 were counted. The 2004 amendments to the law (SB 1224) require all infants and children from birth to age 6 be in an approved "child passenger restraint system" whether in the front or back seat. Given the limitations of observing children in a few seconds at roadway intersections and shopping malls, no distinction was made between the ages of 1 to 6. Thus, if a small child (other than an infant) was belted in the front or back seat, it was recorded as a properly belted observance.

- Drivers would be counted because of their culpability under the law and to permit a comparison to the statewide surveys of automobile safety belt use.

- In part because of procedures established when earlier child restraint surveys were conducted, the actual mode of observation would follow both a training manual prepared by the Institute for Public Affairs under a previous contract with OHSO and NHTSA's Guidelines.

- A modified random selection of sites was used that assured an adequate dispersion of sites geographically and by a metropolitan/non-metropolitan division.

General Site Selection

The total number of observation sites selected was first determined by a division of the state by metropolitan statistical area (MSA) and non-MSA classification. Using Census data for 2000, 60.8% of the state's population resides in an MSA.

One hundred randomly chosen sites with 25 observations per site were selected, yielding a sample size of 2,500. Of these 100 sites, 57 were in MSAs and 43 were in non-MSAs. Assignment for sites within the MSAs was based on the weighing of a particular MSA's population against the total metropolitan population in the state (less the Ft. Smith, Arkansas MSA). Using this criterion the Oklahoma City MSA was assigned the greatest number of sites (29). Enid, being the smallest MSA, had the fewest sites (2).

The non-MSA remainder of the state was divided into four quadrants using the two principal north-south and east-west arterials bisecting the state, Interstate Highway 35 (I-35, north-south) and Interstate Highway 40 (I-40, east-west). Each quadrant was allotted its proportionate number of the 43 remaining sites based on its share of the state's population. Certain unusual site determinations resulted from the procedure outlined above. For example: although Enid has nearly four times the population of Woodward in the northwest, because Enid is an MSA it was assigned only two sites. Woodward, a non-MSA community, was designated for three sites because it was the largest community in the northwest when Enid was deleted from consideration.

The total of 100 sites were chosen as follows:

Oklahoma City and Metro	29
Tulsa and Metro	22
Enid	2
Lawton	4
Non-MSA	43
	100

Specific Site Selection

The sites were chosen in the following manner:

- City maps were used to provide a geographical distribution of sites in each city. Further, U.S. Bureau of the Census population data were used to capture an adequate measure of the socioeconomic and racial mix of each city;

- Tentative locations chosen for both their suitability and accessibility by the general population were designated;

- Field checks by survey teams were then made to ascertain the suitability of each tentative site. Shopping malls, fast food restaurant chains, department store chains, and recreation facilities were selected based on the following characteristics:

  a) accessibility by the general population to the selected site;
  b) accessibility to vehicular traffic;
  c) sufficient traffic volume existing to generate 25 observations of children in cars;
  d) locations represented the regional variations in socioeconomic and racial characteristics;

The observer was advised that upon arrival at a specific observation site a determination should be made as to its suitability following the criteria enumerated above. If the pre-assigned site was not suitable, the observer was permitted to make another selection that would be more satisfactory. In most cases when a change was necessary, a site within one mile of the original site was used.

The following lists the specific communities and exact locations where child restraints were observed:

Site	Oklahoma City (18)
1.	McDonald's (NW 122nd at Penn)
2.	Babies R' Us (Penn at NW 50th)
3.	Crossroads Mall (I-35 at Crossroads Blvd.)
4.	McDonald's (NW 23rd at Penn)
5.	Economy Square Mall (SW 29th at May)
6.	Target (SW 44th at Western)
7.	WalMart Supercenter (I-240 at Santa Fe)
8.	WalMart (NW 23rd at MacArthur)
9.	Hobby Lobby (7012 NW Expressway)
10.	Carl's Jr. (NE 36th at Lincoln Blvd.)
11.	Hometown Markets (NE 23rd at Martin Luther King Blvd.)
12.	McDonald's (6700 N. May)
13.	McDonald's (N. May at Hefner Rd.)
14.	McDonald's (5812 NW Expressway)
15.	McDonald's (6012 S. Penn)
16.	McDonald's (I-240 at S. Western)
17.	Oklahoma City Zoo (NE 50th at Martin Luther King Blvd.)
18.	Braum's (436 SW 59th)

Site	Oklahoma City Metro (11)
19.	Edmond: Albertsons (15th St. at Broadway)
20.	Edmond: Super Target (1200 E. 2nd St.)
21.	Norman: Sooner Fashion Mall (Main at I-35)
22.	Norman: McDonald's (Lindsey at McGee)
23.	Norman: WalMart Supercenter (Main at NE 12th Street)
24.	Midwest City: Heritage Park Mall (Reno at Air Depot)
25.	Midwest City: WalMart (Midwest Blvd. at Reno)
26.	Moore: WalMart (S.E. 19th at I-35)
27.	Mustang: WalMart (200 N. Mustang Road)
28.	Yukon: Snyder's Food Mart (10 W. Main)
29.	Bethany: Albertsons (NW 23rd at Rockwell)

Site	Tulsa (15)
30.	Woodland Hills Mall (7021 S. Memorial)
31.	WalMart (81st at Lewis)
32.	Albertson's (51st at Memorial)
33.	Toys R' Us (Eastland Plaza 14002 E. 21st)
34.	Tulsa Promenade Mall (41st Street at Yale)
35.	Braum's (1308 S. Garnett Rd.)
36.	McDonald's (4003 E. 11th)
37.	Big Splash Water Park/Centennial Plaza (21st Street at Yale)
38.	WalMart (5310 S. Elm Place)
39.	Braum's (5048 S. 33rd West Ave.)
40.	McDonald's (5151 S. Harvard)
41.	McDonald's (7315 S. Memorial Dr.)
42.	McDonald's (4249 S. Yale)
43.	Jenks: Jenks Municipal Park (Elm Street at Main Street)
44.	Wendy's across the street from Utica Square (21st at Utica)

Site	Tulsa Metro (7)
45.	Broken Arrow: WalMart (2300 East Kenosha)
46.	Broken Arrow: McDonald's (3800 S. Elm Place)
47.	Broken Arrow: McDonald's (Kenosha at Elm)
48.	Bristow: WalMart (Main at SH16)
49.	Owasso: Reasor's (86th St. North at 117th Street)
50.	Sand Springs: Wendy's (Adams Road at Charles Page Blvd.)
51.	Sapulpa: WalMart (Hwy. 117 at US 66)
Site	Enid (2)
52.	McDonald's (Maine at Van Buren)
53.	Oakwood Mall (O.K.Garriott at Oakwood)
Site	Northeast (18)
54.	Bartlesville: Braum's (2539 SE Washington)
56.	Bartlesville: WalMart (3901 Adams Road)
57.	Muskogee: Braum's (2909 Old Shawnee Road)
58.	Muskogee: McDonald's (101 S. 32nd Street)
59.	Muskogee: Arrowhead Mall (Denison Avenue at Main - downtown)
60.	Stillwater: McDonald's (920 W. 6th)
61.	Stillwater: WalMart (Virginia at Perkins Rd.)
62.	Stillwater: Bradford Plaza (Hall of Fame at Washington)
63.	Vinita: WalMart (S. US 66)
64.	Henryetta: WalMart (E. Main St.)
65.	Ponca City: Walmart Supercenter (Prospect Ave.)
66.	Ponca City: McDonald's (N. 14th)
67.	Miami: WalMart (2015 N. Main)
68.	Miami: Walgreens (N. Main)
69.	Tahlequah: WalMart (Cherokee Hills Shopping Center)
70.	Okmulgee: WalMart (Hwy. 75 South)
71.	Okmulgee: Dairy Queen (W. 56 Hwy.)
Site	Lawton (4)
72.	Central Mall (2nd at C Streets)
73.	McDonald's (Lee at 11th)
74.	Hobby Lobby/Ross/Goody's (strip mall: Sheridan at Gore)
75.	WalMart Supercenter (NW 38th at Cache Road)
Site	Southeast (10)
76.	McAlester: WalMart (Hwy. 69 at Comanche)
77.	McAlester: McDonald's (1758 E. Carl Albert Pkwy)
78.	Ada: Braum's (830 N. Country Club Drive)
79.	Ada: Walmart Supercenter (E. Lonnie Abbott Drive at Country Club Dr.)
80.	Ardmore: WalMart (601 N. Commerce)
81.	Ardmore: Burger King (Broadway at I-35)
82.	Durant: WalMart (2418 W. Main)
83.	Hugo: WalMart (US 70)
84.	Pauls Valley: WalMart Supercenter (I-35 exit toward downtown)
85.	Idabel: WalMart (901 SE Washington)

Site	Northwest (5)
86.	Woodward: WalMart (Downs at 8th Street)
87.	Woodward: Braum's (West Oklahoma)
88.	Woodward: McDonald's (2720 W. Oklahoma)
89.	Alva: WalMart (Murray Plaza Shopping Center)
90.	Guymon: WalMart (US 64 N.)
Site	Southwest (10)
91.	Duncan: Braum's (US 81 N.)
92.	Duncan: Fun Park (US 81 N.)
93.	Duncan: WalMart (US 81 N.)
94.	Chickasha: Braum's (4th Street at Grand)
95.	Altus: WalMart (US 62 at US 283 to Main/Sequoyah)
96.	Altus: McDonald's (Broadway at US 62)
97.	Elk City: WalMart (W. of City on Business-40)
98.	Clinton: K-Mart (Gary Blvd.)
99.	Chickasha: WalMart (2030 S. 4th)
100.	Weatherford: WalMart (I-40 exit towards town)

Comment on Sampling Procedure

As indicated previously, the procedure followed for selecting locations does not produce a strictly random sample. The design employed for this effort does bear some similarity, however, to a multistage cluster sampling procedure, in which samples are taken of groups of elements (clusters) followed by the selection of elements within each selected cluster. In this case, the initial clusters were MSA/non-MSA. Then a further stratification was employed on the basis of geographical regions of the state. Finally, population size and observation site were incorporated into the final selection process. Strictly speaking, the decision to choose one city or town over another was not completely random; however, the procedure followed in selecting observation locations along with total number of sites and observations collected should, in combination, yield a fairly representative picture of the actual proportion of Oklahoma children covered under the law who may or may not be currently protected by either child safety seats or seat belts. The continued use of the procedure and design employed for the initial survey should permit a reasonably accurate assessment of changes in restraint use over time.

Observer Selection and Training

To assure greater control and coordination, a decision was made to employ a small number of graduate assistants utilizing teams of two people whenever possible and requiring at least one of the two observers to have experience in installing a car seat or other child restraint device. The observers participated in a classroom seminar session in which the nature of the project was discussed followed by a detailed briefing of data collection procedures based on the previously mentioned NHTSA Guidelines (1983) and the Institute for Public Affairs Training Manual (2005). The second training phase involved a field exercise, which required the actual observation of child restraint use at a particular location simulating actual field conditions and the completion of the forms for recording those observations. Six people were selected as observers.

Data Collection Procedures

Observers were told to follow the procedures outlined in the Guidelines and Training Manual. The child safety seat observation form was provided for each site (Appendix A). Observers were instructed to:

1) Ignore any obvious out-of-state car;

2) Record the date, day of week, and time of observations;

3) Record the exact location of each site;

4) Record the age (infant or small child) and race (white or non-white) of the child;

5) Record whether or not the child was restrained, the type of restraint, and the direction the child was facing in the vehicle;

6) Record the type of vehicle (automobile, SUV/Jeep, pickup, or van); and,

7) Record whether or not the driver was belted.

It should be noted that observers use the SUV/Jeep code to minimize observer error but these vehicles are subsequently re-coded as automobiles for analysis. For all sites, the observations were made within a one week period between the hours of 7:00 a.m. and 7:00 p.m.