

STATEWIDE CHILD RESTRAINT SURVEY

July 2009



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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: May 2004, May 2005, June 2006, July 2007, July 2008, and July 2009. 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

	2004	2005	2006	2007	2008	2009
Combined	80.6	82.7	86.7	85.4	85.0	86.3
Infants (Up to 1 year)	65.8	73.4	78.4	82.5	68.8	74.6
Children (1-6 years)	83.0	84.1	87.6	85.7	87.3	87.9

Overall, the combined percentage of children who were properly restrained increased from 80.6% in 2004 to 86.3% in 2009 and increased 1.3 percentage points over 2008. Over this six-year period, the protection rate for infants increased from 65.8% to 74.6%. The properly restrained rate for infants was unusually low in 2008 (68.8%) compared to recent years and rebounded somewhat in 2009 (74.6%). The percentage of small children who were properly restrained increased from 83.0% to 87.9% since 2004 and increased slightly (0.6 percentage points) since last year.

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. Data presented in the National Occupant Protection Use Survey for 2008 (Pickrell and Ye, 2009) indicates that 99.0% of infants, 92.0% of children age 1-3, and 89.0% of 4-7 year olds were restrained in some type of restraint. Nationally the overall restraint rate was 89.0% in 2008. Of those observed in the 2008 Oklahoma study, 95.7% of the infants and 87.3% of the small children were restrained in some way with an overall restrained rate of 88.3% (James and Krimmer, 2008). In 2009, the rates for those using any type of restraint have increased: 98.4% for infants, 87.8% for small children, and an overall rate of 89.1%. Of infants and small children restrained in any way, 96.8% were restrained properly.

The National Highway Traffic Safety Administration's (NHTSA) State Data System Analysis (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 (Pickrell and Ye, 2009). Oklahoma observations during 2009 support the NHTSA findings. Oklahoma infants and small children are less likely to be restrained in the front seat (15.6% not restrained) than in the back seat (9.9%).

A comparison to the 2008 survey results shows an increase in the protection rate for infants from 68.8% to 74.6%, while the protection rate for small children increased from 87.3% in 2008 to 87.9% in 2009. The difference in the properly restrained rate for white infants and small children compared to non-whites continued to decrease. For the first time, the rate at which non-white infants and small children combined were properly restrained (89.1%) exceed that of white infants and small children (85.4%). Children in vehicles observed within urban areas compared to those in non-urban areas were restrained at a substantially higher rate (90.9% to 80.2%). The safety of infants and small children riding in vans was highest with 91.7% properly restrained, followed by 87.1% in automobiles, and 75.4% in pickup trucks.

Substantial differences in restraint rates exist across the regions of the state. Oklahoma City proper and Oklahoma City’s surrounding metropolitan area (96.0% and 94.2%, respectively) had the highest percentage of infants and small children properly restrained. The Southwest (76.9%) and Southeast Regions (74.0%) had the lowest restraint rates.

Regional Restraint Rates - 2009

Region	Percent Properly Restrained
Oklahoma City Proper	96.0
Oklahoma City Metro	94.2
Northwest	89.1
Tulsa Metro	88.6
Tulsa Proper	85.6
Northeast	84.4
Southwest	76.9
Southeast	74.0

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 (89.9%) than when the driver is not belted (68.4%). Infants and children are 1.3 times more likely to be properly restrained when riding in a vehicle with a belted driver compared to those riding with an unbelted driver. Similarly, Pickrell and Ye’s recent report

(2009) on child restraint use notes that 92% of birth to seven years old children driven by buckled drivers were restrained, compared to 54% for children riding with unbelted drivers.

Percent Properly Restrained by Driver Belted or Not

	Driver Belted	Driver Not Belted
Combined	89.9	68.4
Infants (Up to 1 year)	72.3	93.8
Children (1-6 years)	92.5	66.3

The benefits of child restraint use continue to be substantial. The National Highway Traffic Safety Administration (NHTSA) notes that over the period 1975 through 2007, an estimated 8,709 lives were saved by child restraints (child restraints and adult safety belts). Among children under the age of five, an estimated 382 lives were saved in 2007 by child restraint use. An estimated 543 lives could have been saved in 2007 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 (1-4 years old) in passenger cars. These reductions are 58% and 59%, respectively, for infants and toddlers riding in pickup trucks (NHTSA, 2008).

The 2009 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).

Generally, the proportions of infants and small children who are properly restrained continue to increase across the state. In light of the data collected in the 2009 study, 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: 2009

INTRODUCTION

This report is the 23th 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 2009.

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 Conducting 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 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 2009 sample of 2,500 children contains a racial composition of 79.6% white and 20.4% non-white (Table 1). Observers were instructed to code racial/ethnic groups such as Native Americans, Hispanics, and Asians as "white." Of the total Oklahoma 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 2009 sample, 57% 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 2004 to 2009 surveys. The proportion of infants observed (12.0%) relative to small children (88.0%) is almost the same as last year and up slightly compared to 2006 and 2007. As in past years, the preponderance of vehicles observed were automobiles (72.2%). Of the drivers, 83.3% were belted.

TABLE 1

Frequency Distribution of Sample Characteristics, 2004 - 2009

CHARACTERISTIC	2004	2005	2006	2007	2008	2009
<u>Race (N=2,471)</u>						
White	79.9	77.3	76.8	80.6	79.2	79.6
Non-white	20.1	22.7	23.2	19.4	20.8	20.4
<u>Age (N=2,500)</u>						
Infants (Birth - 1 year)	14.2	13.1	9.4	11.0	12.2	12.0
Children (1-6 years)	85.8	86.9	90.6	89.0	87.8	88.0
<u>Type of Restraint (N=2,500)</u>						
Car Seat	52.1	39.6	43.2	38.1	41.8	44.5
Seat Belt	32.8	46.0	45.2	49.1	46.5	44.6
No Restraint	15.2	14.3	11.6	12.8	11.7	10.9
<u>Type of Vehicle (N=2,500)</u>						
Automobile*	71.3	69.8	71.8	74.0	73.4	72.2
Pickup	12.0	11.4	11.4	12.6	12.7	12.8
Van	16.7	18.7	16.8	13.3	14.0	15.0
<u>Driver (N=2,500)</u>						
Belted	80.1	80.4	87.5	84.9	83.5	83.3
Not Belted	19.9	19.6	12.5	15.1	16.5	16.7

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

ANALYSIS OF STATEWIDE CHILD RESTRAINT USE

The analyses in this section describe 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 2004 to 2009). 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 2009 who were restrained properly and improperly (89.1%) increased slightly (0.8 percentage points) and those who were properly restrained (86.3%) also increased compared to 2008 (1.3 points). Of those infants and children restrained in either a car seat or belt (proper and improper), 96.8% were restrained properly. Data presented in the National Occupant Protection Use Survey for 2008 (Pickrell and Ye, 2009) indicates that 99% of infants, 92% of children age 1-3, and 89% of 4-7 year olds were restrained in some type of restraint. Nationally the overall restraint rate was 89%. The rates for Oklahoma compare very favorably with the national data. Of those observed in the 2008 Oklahoma study, 95.7% of the infants and 87.3% of the small children were restrained in some way with an overall restrained rate of 88.3% (James and Krimmer, 2008). The 2009 observations reflect a further increase in these rates; 98.4% of the infants and 87.8% of the small children were restrained (properly and improperly).

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 rates of infants and small children who were properly restrained generally have increased since 2004. The properly restrained rate for infants dipped sharply in 2008 (68.8%) but rebounded in 2009 (74.6%). The rate for small children continued its general upward trend over the past six years; 87.9% were properly restrained in 2009, compared to 83% in 2004.

Over the years, small children have been more likely to be properly restrained than infants and the same pattern is evident in 2009, with 87.9% of small children properly restrained compared to 74.6% of infants. Overall, 86.3% of the total sampled infants and children in 2009 were properly restrained as compared with 80.6% in 2004, an overall increase of 5.7 percentage points.

When considering race, white infants and children combined experienced a slight increase (0.4 percentage points) in the properly restrained rate, while the rate for non-white infants and children combined increased by 4.0 percentage points. Recent years have seen a continuation of the general decline in the difference in the properly restrained rates for white and non-white infants and children. The rates for 2008 were virtually the same (85.0% for whites and 85.1% for non-whites). In 2009, for the first time, non-white infants and children were properly restrained at a higher rate than white infants and children (89.1% and 85.4%, respectively). The protection rates for white and non-white children have increased by 3.3 and 15.1 percentage points, respectively, from 2004 to 2009.

TABLE 2

Child Restraint Use, 2004 - 2009

<u>Percent Restrained</u>							
<u>Restrained (N=2,500)</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>Change 2008-2009</u>
Restrained (proper and improper)	84.8	85.7	88.4	87.2	88.3	89.1	+0.8
Properly Restrained	80.6	82.7	86.7	85.4	85.0	86.3	+1.3
Properly Restrained as a Percent of Restrained (proper and improper)	95.0	96.5	97.6	97.9	96.3	96.8	+0.5
Not Restrained	15.2	14.3	11.6	12.8	11.7	10.9	+0.8
<u>Percent Properly Restrained</u>							
	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>Change 2008-2009</u>
<u>Infants/Children</u>							
Infants	65.8*	73.4*	78.4*	82.5	68.8*	74.6* (N=299)	+5.8
Children	83.0*	84.1*	87.6*	85.7	87.3*	87.9* (N=2,201)	+0.6
Combined	80.6	82.7	86.7	85.4	85.0	86.3 (N=2,500)	+1.3
<u>Race</u>							
White	82.1*	84.9*	87.3	86.0*	85.0	85.4* (N=1,968)	+0.4
Non-white	74.0*	74.5*	84.7	82.6*	85.1	89.1* (N=503)	+4.0
<u>Metropolitan Area</u>							
Metropolitan**	82.9*	85.4*	89.4*	84.8	89.8*	90.9* (N=1,425)	+1.1
Non-metropolitan	77.5*	79.1*	83.2*	86.1	78.7*	80.2* (N=1,075)	+1.5

*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 infants and children, white and non-white children, and metro and non-metro areas are statistically significant at the .05 level for 2009.

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

The 2009 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) (90.9% protected) to those in non-MSAs (80.2%). 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. Since 2004, the overall protection rate for infants and small children observed in an MSA increased 8.0 percentage points. The protection rate in non-MSAs also improved over the last six years (2.7 percentage points), but not as much.

As noted previously, of the 2500 drivers observed, 83.3% were belted. Table 3 shows the dramatic difference in child restraint use when the driver of the vehicle is using a safety belt, compared to when the driver is not belted. Overall, 89.9% of the infants and children riding with a belted driver were properly restrained with only 68.4% 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, the percentage properly restrained has fluctuated between 90.8% and 89.9% between 2004-2009 when riding with a belted driver. These up and down patterns are evident for both infants and small children. Consequently, looking at change over time also will vary substantially, depending on which year is use as the base from which to compare. When the driver was not belted, 68.4% of small children were properly restrained in 2009. However, the general trend for infants and children riding with drivers who were not belted has been an increase in the percentage of those properly restrained. The percentage of infants and small children combined properly restrained increased by 29 points from 2004 to 2009; proper restraint of small children increased by 29 percentage points. Infants with drivers who were not buckled were restrained at a rate of 93.8%. However, only 32 infants were observed with these drivers and the extremely high rate is likely to be an anomaly. The rate probably will decrease in coming years.

In comparison to the 2008 results, the 2009 survey reflects an overall decrease of 1.1 percentage points (91.0% to 89.9%) for properly restrained infants and small children in vehicles in which a driver was using a safety belt. This is the second year in a row with a decrease. Although infants were properly restrained at a somewhat higher rate in 2009 compared to 2008 (72.3% and 69.5%, respectively), the percentage of small children who were protected decreased, from 94.2% in 2008 to 92.5% in 2009.

When the driver was not belted, there was a substantial overall increase in proper restraint use of 13.5 percentage points (54.9% to 68.4%) from 2008 among all children observed. The percentage of small children who were properly restrained increased from 2008 to 2009 by 12.2 percentage points (54.1% to 66.3%). While protected infants experienced a very large increase (30.9 percentage points), this change should be regarded with very little confidence given the small number of observations and the likely anomalous rate of restraint. 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 1.3 times more likely to be protected as compared to children riding with unbelted drivers (89.9 versus 68.4%).*

TABLE 3

Child Restraint Use By Whether or Not the Driver is Belted, 2004 - 2009

<u>Percent Properly Restrained</u>							
<u>Driver Belted</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>Change 2008-2009</u>
Infants	68.6*	80.4*	79.8*	83.2*	69.5*	72.3*	+2.8
Children	94.8*	96.2*	93.6*	95.0*	94.2*	92.5*	-1.7
Combined	90.8	94.1	92.2	93.6	91.0	89.9	-1.1
						(N=2,082)	
<u>Driver Not Belted</u>							
Infants	49.0*	37.3	61.1	75.0*	62.9	93.8*	+30.9
Children	38.3*	36.3	47.5	36.7*	54.1	66.3*	+12.2
Combined	39.4	36.4	48.2	39.2	54.9	68.4	+13.5
						(N=418)	

*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. The difference between infants and small children riding with belted drivers as well as with drivers not belted is statistically significant at the .05 level for 2009.

As in the past, the 2009 study recorded the type of vehicle observed. Vehicles were categorized as automobiles (72.2% of the observations), pickup trucks (12.8%), or vans (15.0%). Table 4 profiles the differences between the protection rate of infants and small children based on the type of vehicle in which they were riding. Like most previous years, the combined rate for all children properly restrained was the highest for vans. Infants and children riding in vans had a combined properly restrained rate of 97.1% (a 4.1 percentage point increase from 2004), while 87.1% of infants and children riding in automobiles were properly restrained (a 6.7 percentage point increase from 2004). Combined protection rates in pickup trucks continued to be the lowest at 75.4% (a 3.5 percentage point increase from 2004).

In comparison to the 2008 results, the combined rate of proper restraint increased for pickups and vans and decreased very slightly for automobiles. The percentage of those riding in automobiles who were properly restrained decreased from 87.4% to 87.1% (0.3% percentage points). Infants and children properly restrained increased when riding in vans (86.8% to 91.7%) and pickups (69.7% to 75.4%) by 4.9 and 5.7 percentage points, respectively.

TABLE 4
Child Restraint Use By Type of Vehicle, 2004 - 2009

<u>Percent Properly Restrained</u>							
<u>Automobiles</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>Change 2008-2009</u>
Infants	66.1*	78.4*	75.9*	85.4	68.7*	73.3* (N=232)	+4.6
Children	83.0*	86.4*	87.3*	85.9	89.8*	89.1* (N=1,572)	-0.7
Combined	80.4*	85.3	86.2	85.8	87.4	87.1 (N=1,804)	-0.3
 <u>Pickup Trucks</u>							
Infants	58.8*	58.8	79.2	45.8*	45.5*	87.0 (N=23)	+41.5
Children	73.6*	65.9	80.5	79.8*	71.5*	74.5 (N=298)	+3.0
Combined	71.9	65.0	80.4	77.2	69.7	75.4 (N=321)	+5.7
 <u>Vans</u>							
Infants	69.8*	61.4*	86.0*	89.5	76.5*	75.0 (N=44)	-1.5
Children	89.6*	86.9*	94.1*	90.5	89.3*	94.0 (N=331)	+4.7
Combined	87.6	83.8	93.1	90.4	86.8	91.7 (N=375)	+4.9

*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. In this table, comparisons are within the categories “automobiles”(includes SUVs and Jeeps), “pickup trucks,” and “vans.” The differences between infants and small children riding in automobiles is significant at the .05 level.

When infants alone are considered, those riding in automobiles are most likely to be properly restrained. However, since 2006, infants riding in vans have had the highest properly restrained rate. This trend has continued in 2009 when comparing vans to automobiles. While, pickup trucks had the highest rate (87.0%), this should be viewed with caution. The number of infants observed in pickups was very small (n=23) and the high rate of restraint is not at all in line with previous years. Although the properly restrained rate decreased somewhat for infants in vans from 2008 to 2009 (76.5% to 75.0%), it still was higher than the rate for automobiles (which increased from 68.7% last year to 73.3% in 2009).

Of the small children observed in 2009, 94.0% of those in vans were properly restrained; a 4.4 percentage point increase since 2004 and a 4.7 point decrease compared to 2008. There was a 6.1 percentage point increase among small children properly restrained in automobiles compared to 2004 (83.0% to 89.1%) but a slight decrease of 0.7 percentage points compared to the previous year. The number of small children properly restrained in pickup trucks has increased by 0.9 percentage points since 2004 and increased by 3.0 points from 2008. The proper use of child restraint systems in vans still remains substantially lower than restraint use in automobiles and 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 2004 to 2009. In the current study, the highest rate of child restraint use was found in the Oklahoma City proper area (96.0%), an increase of 7.6 percentage points over the 2008 rate. The second highest protection rate was observed in Oklahoma City metropolitan area (94.2%), the same as the rate for 2008. The Northwest Region was next with 89.1%, followed closely by the Tulsa metro (88.6%), Tulsa proper (85.6%), the Northeast Region (84.4%), the Southwest Region (76.9%), and finally, the Southeast Region (74.0%).

Statewide the percentage of properly restrained children increased 1.3 percentage points from 2008 to 2009 (85.0% to 86.3%). Four of the eight geographic regions increased the rate of those properly restrained in 2009, led by a 7.6 percentage point increase in the Oklahoma City proper area. Three of the areas decreased with substantial decreases in Tulsa (Tulsa metro down 4.0 points and Tulsa proper down 2.7 percentage points). However, even after the decreases, the restraint rates in most areas remain relatively high.

When considering changes in statewide child protection rates from 2004 to 2009, the percentage of infants and small children combined who were properly restrained has increased by 5.7 percentage points. Only the Northeast Region experienced a decline in the properly restrained rate from 2004 to 2009 (87.3% to 84.4%). The Southeast Region, Northwest Region, Tulsa metro, Oklahoma City proper and the Oklahoma City metro have seen the greatest overall increases in proper restraint use since 2004, ranging from 10 to 12 percentage points.

TABLE 5
Child Restraint Use By Region (Combined Ages), 2004 - 2009

<u>Region</u>	<u>Percent Properly Restrained</u>						<u>Change</u>
	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2008 - 2009</u>
Statewide, Combined Areas	80.6	82.7	86.7	85.4	85.0	86.3	+1.3
Oklahoma City	85.6	79.3	92.0	73.8	88.4	96.0	+7.6
Oklahoma City Metro	84.0	90.9	94.5	85.8	94.2	94.2	0.0
Tulsa	83.7	88.5	86.1	95.5	88.3	85.6	-2.7
Tulsa Metro	76.6	89.7	87.4	96.0	92.6	88.6	-4.0
Northeast Region	87.3	83.3	81.8	90.4	83.8	84.4	+0.6
Northwest Region	77.1	77.1	85.7	81.1	87.4	89.1	+1.7
Southeast Region	64.0	71.6	86.4	84.8	74.4	74.0	-0.4
Southwest Region	74.9	80.6	81.1	79.7	74.3	76.9	+2.6
Total Oklahoma City, OKC Metro, Tulsa, and Tulsa Metro	83.5	86.0	90.2	85.8	90.2	91.5	+1.3

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 (which can be substantial). For example, the child restraint usage in Oklahoma City for 2003 was 75.3%, restraint increased in 2004 to 85.6%, decreased again in 2005 to 79.3%, increased in 2006 to 92.0%, decreased substantially to 73.8% the next year, then increased substantially in 2008 to 88.4% and increased again in 2009 to 96.0%. 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 2004-2006 to 2007-2009 (Table 6). Averaging data over several years helps smooth out the inter-annual fluctuations.

TABLE 6

Child Restraint Use By Region (Rolling Averages), 2004-2006 to 2007-2009

<u>Areas Observed</u>	<u>2004- 2006</u>	<u>2005- 2007</u>	<u>2006- 2008</u>	<u>2007- 2009</u>	<u>Change 2004-2006 to 2007-2009</u>
Statewide, Combined Areas	83.6	84.9	85.7	85.6	+2.0
Oklahoma City	85.6	81.7	87.7	86.1	+0.5
Oklahoma City Metro	89.8	90.4	91.5	91.4	+1.6
Tulsa	86.1	90.0	90.0	89.8	+3.7
Tulsa Metro	84.6	91.0	92.0	92.4	+7.8
Northeast Region	84.1	85.2	85.3	86.2	+2.1
Northwest Region	80.0	81.3	84.7	85.9	+5.9
Southeast Region	74.0	80.9	81.9	77.7	+3.7
Southwest Region	78.9	80.5	78.4	77.0	-1.9
Total Oklahoma City, OKC Metro, Tulsa, and Tulsa Metro areas	86.6	87.3	88.7	89.2	+2.6

Based on the rolling averages, the statewide rate of properly restrained infants and small children has increased 2.0 percentage points from 2004-2006 to 2007-2009 (83.6% to 85.6%). Furthermore, the rates of those properly restrained have increased in all of the geographic areas except one over this six-year period when using the rolling averages. The Southwest Region experienced a decrease of 1.9 percentage points. The largest increases have taken place in the Tulsa metro area (13.9 percentage points in 2004-2006 and 7.8 points in 2007 to 2009). The Southeast Region and Tulsa proper also experienced large increases in 2004-2006 (14.0 and 11.2 points, respectively) and both increased another 3.7 percentage points in the 2007-2009 period.

SUMMARY AND RECOMMENDATIONS

The results of the 2009 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 86.3%. This is an increase from 2008 (1.3 percentage points) and up 5.7 percentage points since 2004.
- ◆ The percentage of infants and small children not restrained at all in 2008 was 10.9% (down from 11.7% in 2008 and down from 15.2% in 2004).
- ◆ Infants (birth to one year) were properly restrained at a rate of 74.6% (up from 68.8% in 2008 and up 8.8 percentage points since 2004).
- ◆ Small children (age 1-6 years) were properly restrained at a rate of 87.9% (up from 87.3% in 2008 and up 4.9 percentage points since 2004).
- ◆ Restraint use by infants and children observed in MSAs (90.9%) was substantially higher than those observed in non-MSAs (80.2%).
- ◆ Non-white infants and small children were more likely to be properly restrained (89.1%) than were white children (85.4%). This is the first time non-whites have had the higher proper restraint rate.
- ◆ Infants and small children traveling in vans and automobiles were more likely to be properly restrained (91.7% and 87.1%, respectively) than those riding in pickup trucks (75.4%).
- ◆ 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 (89.9% of children properly restrained) and when the driver was not belted (68.4% of children properly restrained)—a 21.5 percentage point difference.
- ◆ When comparing geographic regions from 2004 to 2009, the Tulsa metro area, the Northwest Region, Oklahoma City proper, Oklahoma City metro, and the Southeast Region have experienced the highest increase of child restraint use (12.0, 12.0, 10.4, 10.2, and 10 percentage point increases, respectively).
- ◆ When examining three-year rolling averages from 2004-2006 to 2007-2009, seven of the eight geographic areas have seen an increase in the rate of proper restraint. The largest increases have been in the Tulsa metro (7.8 percentage points), the Northwest Region (5.9 percentage points). Tulsa proper and the Southeast Region both had increases of 3.7 percentage points. Only the Southwest Region experienced a decrease during these periods (1.9 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 2007, an estimated 8,709 lives were saved by child restraints (child restraints and adult safety belts). Among children under the age of five, an estimated 382 lives were saved in 2007 by child restraint use. An estimated 543 lives could have been saved in 2007 if all children less than five had been restrained. In 2007, of the 317 deaths of children under the age of 4, 28% were unrestrained, when restraint use was known. Similarly, 44% of the 265 fatalities among children four to seven years old were unrestrained. Research on child safety seats has found them to reduce fatal injury by 71% for infants and by 54% for toddlers (1-4 years old) in passenger cars. These reductions are 58% and 59%, respectively, for infants and toddlers riding in pickup trucks (NHTSA, 2008).

The Oklahoma Department of Public Safety's Highway Safety Office (2007) notes in its *Children Age 1-8 in 2006 Crashes Fact Sheet* report there were 1,582 child passengers in passenger vehicles and pickup trucks that were killed or injured in 2006. Of there, there were 23 fatalities among children age one through eight. Four of the fatalities (17.4%) were not restrained.

Overall, 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 2009 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 2009

Oklahoma Child Restraint Observation Form

Observer: _____

Location: _____

Observation Date: _____

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.

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 1 yr.) 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 1 year) 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 arterial highways 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	<u>43</u>
	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:

<u>Site</u>	<u>Oklahoma City (18)</u>
1.	McDonald's (NW 122 nd at Penn)
2.	Babies R' Us (Penn at NW 50th)
3.	Academy Sports/Chuck E Cheese (I-35 at Walker)
4.	McDonald's (NW 23 rd at Penn)
5.	SW Medical Center Complex (SW 59 th at May)
6.	Target (SW 44 th at Western)
7.	WalMart Supercenter (I-240 at Santa Fe)
8.	WalMart (NW 23 rd at MacArthur)
9.	Target (7012 NW Expressway)
10.	Science Museum (2101 NE 50 th)
11.	Sonic/McDonald's (NE 63 rd 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.	Old Paris Flea Market (1111 S. Eastern) and/or OKC Pool (NE 33 rd at Kelly)
16.	Braums (I-240 at S. May)
17.	Oklahoma City Zoo (NE 50 th at Martin Luther King Blvd.)
18.	Braum's (436 SW 59th)
<u>Site</u>	<u>Oklahoma City Metro (11)</u>
19.	Edmond: Braum's/WalMart (15 th at I-35)
20.	Edmond: Super Target (1200 E. 2 nd St.)
21.	Norman: Sooner Fashion Mall & WalMart Supercenter (Main at I-35)
22.	Norman: Super Target (Robinson at I-35)
23.	Norman: WalMart Supercenter (Main at NE 12 th Street)
24.	Midwest City: Heritage Park Mall (Reno at Air Depot)
25.	Midwest City: Crest Center (E. Glenhaven at E. Reno)
26.	Moore: WalMart (S.E. 19 th at I-35)
27.	Mustang: WalMart (200 N. Mustang Road)
28.	Yukon: Snyder's Food Mart (10 W. Main)
29.	Bethany: Albertsons (NW 23 rd at Rockwell)
<u>Site</u>	<u>Tulsa (15)</u>
30.	Woodland Hills Mall (7021 S. Memorial)
31.	WalMart (81 st at Lewis)
32.	Albertson's (51 st at Memorial)
33.	Toys R' Us (Eastland Plaza 14002 E. 21st)
34.	Tulsa Promenade Mall (41 st Street at Yale)
35.	Braum's (1308 S. Garnett Rd.)
36.	McDonald's (4003 E. 11th)
37.	Big Splash Water Park/Centennial Plaza (21 st Street at Yale)
38.	WalMart (5310 S. Elm Place)
39.	Braum's (5048 S. 33 rd 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 (21 st at Utica)

<u>Site</u>	<u>Tulsa Metro (7)</u>
45.	Broken Arrow: Reasor's Grocery (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 (86 th St. North at 117 th Street)
50.	Sand Springs: Wendy's (Adams Road at Charles Page Blvd.)
51.	Sapulpa: WalMart (Hwy. 117 at US 66)
<u>Site</u>	<u>Enid (2)</u>
52.	McDonald's (Maine at Van Buren)
53.	Oakwood Mall (O.K.Garriott at Oakwood)
<u>Site</u>	<u>Northeast (18)</u>
54.	Bartlesville: Braum's (2539 SE Washington)
56.	Bartlesville: WalMart (3901 Adams Road)
57.	Muskogee: Curt's Plaza (2909 Old Shawnee Road)
58.	Muskogee: McDonald's (101 S. 32 nd Street)
59.	Muskogee: Arrowhead Mall (Denison Avenue at Main - downtown)
60.	Stillwater: McDonald's (920 W. 6 th) and/or Sonic on Perkins Rd.
61.	Stillwater: WalMart (Virginia at Perkins Rd.) and/or Movie Theatre (Lakeview at Perkins)
62.	Stillwater: Bradford Plaza (Hall of Fame at Washington) and/or YMCA (3 rd at Duck)
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.)
<u>Site</u>	<u>Lawton (4)</u>
72.	Central Mall (2 nd at C Streets)
73.	McDonald's (Lee at 11 th)
74.	Shopping Center Strip Mall (Sheridan at Gore)
75.	WalMart Supercenter (NW 38 th at Cache Road)
<u>Site</u>	<u>Southeast (10)</u>
76.	McAlester: WalMart (Hwy. 69 at Comanche)
77.	McAlester: McDonald's (1758 E. Carl Albert Pkwy)
78.	Ada: Arlington Shopping Center (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)

<u>Site</u>	<u>Northwest (5)</u>
86.	Woodward: WalMart (Downs at 8 th Street)
87.	Woodward: Braum's (West Oklahoma)
88.	Woodward: McDonald's (2720 W. Oklahoma)
89.	Alva: WalMart (Murray Plaza Shopping Center)
90.	Guymon: United Grocery (US 64 N.)

<u>Site</u>	<u>Southwest (10)</u>
91.	Duncan: Braum's (US 81 N.)
92.	Duncan: Community Pool (US 81 N.)
93.	Duncan: WalMart (US 81 N.)
94.	Chickasha: Braum's (4 th 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: Walgreens and/or WalMart (W. of City on Business-40)
98.	Clinton: McDonald's and Homeland (Gary Blvd.)
99.	Chickasha: WalMart (2030 S. 4 th)
100.	Weatherford: WalMart (I-40 exit toward 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 (2009). 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.

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 the gender of the driver and 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 8:00 p.m.