

# OKLAHOMA STATEWIDE CHILD RESTRAINT SURVEY

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Robert D. Delano, Ph.D.  
Associate Professor

University of Central Oklahoma  
College of Education and Professional Studies  
Department of Adult Education and Safety Science  
Industrial Safety Program  
100 N. University Dr., HES 200A  
Edmond, Oklahoma 73034

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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: June 2006, July 2007, July 2008, July 2009, June 2010, and June 2011. 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 eight 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**

	2006	2007	2008	2009	2010	2011
<b>Combined</b>	86.7	85.4	85.0	86.3	85.5	82.6
<b>Infants (Up to 1 year)</b>	78.4	82.5	68.8	74.6	73.1	64.0
<b>Children (1-8 years)</b>	87.6	85.7	87.3	87.9	87.5	85.6

Overall, the combined percentage of infants and children properly restrained decreased from 86.7% in 2006 to 82.6% in 2011. The 2011 number has fallen back to the level observed in 2005 (82.7%). Over this six-year period, the protection rate for infants decreased from 78.4% to 64.0%. The properly restrained rate for infants was also low in 2008 (68.8%) but rebounded somewhat in 2009 (74.6%), and 2010 (73.1%). The percentage of small children who were properly restrained decreased slightly from 87.6% in 2006 to 85.6 in 2011.

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. The most recent data available, as 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). The 2011 Oklahoma Study found 93.5% of infants and 85.6% of small children restrained in some way, with an overall restrained rate of 86.8%. Of the infants and children restrained in any way, 95.2% were properly restrained.

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 2011 support the NHTSA findings. Oklahoma infants and small children are less likely to be restrained in the front seat (21.7% not restrained) than in the back seat (11.7% not restrained).

A comparison to the 2010 survey results shows a decrease in the protection rate for infants from 73.1% to 64.0%, while the protection rate for small children decreased slightly from 87.5% in 2010 to 85.6% in 2011. The difference in the properly restrained rate for white infants and small children compared to non-whites increased, continuing the general trend since 2006. The rate at which white infants and small children combined were properly restrained decreased 3.5 percentage points in 2011 (83.5%), the rate for non-white infants and small children decreased 2.4 points to 77.0%. Children in vehicles observed within urban areas compared to non-urban areas were properly restrained at different rates (86.3% and 77.6%, respectively). This represents a decrease of 0.2 percentage points from 2010 for urban areas and a decrease of 6.6 points for non-urban areas. The safety of infants and small children riding in vans was highest with 86.8% properly restrained, followed by 83.0% in automobiles, and 76.1% in pickup trucks.

Substantial differences in restraint rates exist across the regions of the state. Oklahoma City’s surrounding metropolitan area (98.5%) and the Tulsa metro area (88.9%) had the highest percentage of infants and small children properly restrained. The Southeast Region (72.4%) had the lowest restraint rate, as it also did in 2010 (78.0).

**Regional Restraint Rates - 2011**

<b>Region</b>	<b>Percent Properly Restrained</b>
Oklahoma City Metro	98.5
Tulsa Metro	88.9
Southwest	85.7
Tulsa	81.9
Oklahoma City	80.9
Northwest	80.6
Northeast	76.9
Southeast	72.4

The greatest variation in use of child restraints was found when considering whether or not the driver was belted. Infants and small children are more likely to be restrained properly when the driver is wearing a seatbelt (87.7%) than when the driver is not belted (60.8%). Infants and children are much more likely to be properly restrained when riding in a vehicle with a belted driver compared to those riding with an unbelted driver. Pickrell and Ye’s recent report (2009) on child restraint use notes that 92% of birth to seven year 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**

	<b>Driver Belted</b>	<b>Driver Not Belted</b>
<b>Combined</b>	87.7	60.8
<b>Infants (Up to 1 year)</b>	64.7	61.2
<b>Children (1-8 years)</b>	91.5	60.7

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 2011 Oklahoma child restraint study shows a very strong connection between driver 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).

In light of the data collected in the 2011 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.
- 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.

# OKLAHOMA CHILD RESTRAINT OBSERVATION STUDY: 2011

## INTRODUCTION

This report is the 25<sup>th</sup> statewide observation study of the use of child restraints by infants (birth to one year) and small children (one to eight years of age) in Oklahoma. The study was conducted by the University of Central Oklahoma, College of Education and Professional Studies, Department of Adult Education and Safety Science, Industrial Safety Program, under contract with the Oklahoma Highway Safety Office (OHSO). Observations occurred during June 2011.

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. For continuity purposes, the University of Central Oklahoma, College of Education and Professional Studies, Department of Adult Education and Safety Science, Industrial Safety Program used the survey instrument (Appendix A) developed by the Institute of Public Affairs at the University of Oklahoma.

## 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 four to six 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 2011 sample of 2,500 children contains a racial composition of 75.4% white and 24.6% 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 2011 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 2006 to 2011 surveys. The percentage of infants observed (14.2%) is up 0.7 percentage points compared to 2010, while the percentage of small children observed (85.8%) declined by a similar amount. As in past years, the preponderance of vehicles observed were automobiles (71.7%). Of the drivers, 81.0% were belted.

<b>TABLE 1</b>						
<b>Frequency Distribution of Sample Characteristics, 2006 - 2011</b>						
<b>CHARACTERISTIC</b>						
<b><u>Race (N=2,500)</u></b>	<b><u>2006</u></b>	<b><u>2007</u></b>	<b><u>2008</u></b>	<b><u>2009</u></b>	<b><u>2010</u></b>	<b><u>2011</u></b>
White	76.8	80.6	79.2	79.6	80.2	75.4
Non-white	23.2	19.4	20.8	20.4	19.8	24.6
<b><u>Age (N=2,500)</u></b>						
Infants (Birth - 1 year)	9.4	11.0	12.2	12.0	13.5	14.2
Children (1-8 years)	90.6	89.0	87.8	88.0	86.5	85.8
<b><u>Type of Restraint (N=2,500)</u></b>						
Car Seat	43.2	38.1	41.8	44.5	48.1	40.8
Seat Belt	45.2	49.1	46.5	44.6	40.5	45.9
No Restraint	11.6	12.8	11.7	10.9	11.4	13.2
<b><u>Type of Vehicle (N=2,500)</u></b>						
Automobile*	71.8	74.0	73.4	72.2	72.2	71.7
Pickup	11.4	12.6	12.7	12.8	12.8	14.1
Van	16.8	13.3	14.0	15.0	15.0	14.2
<b><u>Driver (N=2,500)</u></b>						
Belted	87.5	84.9	83.5	83.3	88.4	81.0
Not Belted	12.5	15.0	16.5	16.7	11.6	19.0

\*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 eight years of age), then separately for infants and small children during six separate time periods (from 2006 to 2011). The remainder of the data is 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 2011 who were restrained properly and improperly (86.8%) a decrease of (1.8 percentage points) and those who were properly restrained (82.6%) also decreased compared to 2010 (2.9 points). Of those infants and children restrained in either a car seat or belt (proper and improper), 95.2% were restrained properly. The most recent data available, as presented in the National Occupant Protection Use Survey for 2008 (Pickrell and Ye, 2009), indicate 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%. Oklahoma rates from the same time period (2008 Oklahoma study) compare favorably with the national data: 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 2011 Oklahoma Study found very similar restraint levels: 93.5% of infants and 85.6% of small children restrained in some way, with an overall restrained rate of 86.8%, although they are slightly lower than 2010.

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 combined who were properly restrained have been relatively stable (slight fluctuations) from 2006 – 2010, with a significant decrease in 2011 (2.9%). The properly restrained rate for infants dipped sharply in 2008 (68.8%), rebounded in 2009 (74.6%), declined slightly (73.1%) in 2010, and then dipped sharply again in 2011(64.0%). As with infants, the rate for small children has remained fairly constant (slight fluctuations) from 2006-2010, with a slight decrease in 2011 (85.6%). The 85.6% children properly restrained in 2011, compares favorably to 2007 (85.7%).

Over the years, small children have been more likely to be properly restrained than infants and the same pattern is evident in 2011, with 85.6% of small children properly restrained compared to 64.0% of infants. Overall, 82.6% of the total sampled infants and children in 2011 were properly restrained as compared with 86.7% in 2006, an overall decrease of 4.1 percentage points.

When considering race, the difference in the properly restrained rate for white infants and small children compared to non-whites increased, continuing the general trend since 2006. The rate at which white infants and small children combined were properly restrained decreased 3.5 percentage points in 2011 (83.5%), the rate for non-white infants and small children decreased

2.4 points to 77.0%.

<b>TABLE 2</b>							
<b>Child Restraint Use, 2006 - 2011</b>							
<b><u>Percent Restrained</u></b>							
<b><u>Restrained (N=2,500)</u></b>	<b><u>2006</u></b>	<b><u>2007</u></b>	<b><u>2008</u></b>	<b><u>2009</u></b>	<b><u>2010</u></b>	<b><u>2011</u></b>	<b><u>Change 2010-2011</u></b>
Restrained (proper and improper)	88.4	87.2	88.3	89.1	88.6	86.8	-1.8
<b>Properly Restrained</b>	86.7	85.4	85.0	86.3	85.5	82.6	-2.9
Properly Restrained as a Percent of Restrained (proper and improper)	97.6	97.9	96.3	96.8	96.5	95.2	-1.3
<b><u>Percent Properly Restrained</u></b>							
	<b><u>2006</u></b>	<b><u>2007</u></b>	<b><u>2008</u></b>	<b><u>2009</u></b>	<b><u>2010</u></b>	<b><u>2011</u></b>	<b><u>Change 2009-2010</u></b>
<b><u>Infants/Children</u></b>							
Infants	78.4*	82.5	68.8*	74.6*	73.1*	64.0*	-9.1
Children	87.6*	85.7	87.3*	87.9*	87.5*	85.6*	-1.9
Combined	86.7	85.4	85.0	86.3	85.5	82.6	-2.9
						(N=228)	
						(N=1,836)	
<b><u>Race</u></b>							
White	87.3	86.0*	85.0	85.4*	87.0*	83.5*	-3.5
Non-white	84.7	82.6*	85.1	89.1*	79.4*	77.0*	-2.4
						(N=1,833)	
						(N=561)	
<b><u>Metropolitan Area</u></b>							
Metropolitan**	89.4*	84.8	89.8*	90.9*	86.5	86.3*	-0.2
Non-metropolitan	83.2*	86.1	78.7*	80.2*	84.2	77.6*	-6.6
						(N=1,425)	
						(N=1,075)	

\*Differences are statistically significant at the .0001 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 and white and non-white children are statistically significant at the .0001 level for 2011.

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

According to the census bureau, Metropolitan Statistical Areas (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 Oklahoma 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 2011 study once again indicated a difference in child protection when observations at the 100 sites were analyzed by comparing those observed in MSAs who were protected at a rate of 86.3% to those in non-MSAs (77.6%). Between 2010 and 2011, the overall protection rate for infants and small children observed in an MSA decreased 0.2 percentage points and protection rate in non-MSAs decreased 6.6 percentage points.

As noted previously, of the 2500 drivers observed, 81.0% 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, 87.7% of the infants and children riding with a belted driver were properly restrained while only 60.8% of the infants and children were 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 up and down during 2006-2011 period. 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 used as the base from which to compare. When the driver was not belted, 61.2% of infants, 60.7% of small children, and 60.8% overall were properly restrained in 2011. The general trend has been an increase in the percentage properly restrained for those riding with unbelted drivers.

In comparison to the 2010 results, the 2011 survey reflects an overall decrease of 3.0 percentage points (90.7% to 87.7%) for properly restrained infants and small children in vehicles in which the driver was using a safety belt. The percentage of infants who were protected decreased from 74.2% to 64.7% in 2011 when the driver was belted. While the percentage of small children who were protected decreased slightly from 93.4% to 91.5% in 2011 when riding with a belted driver.

When the driver was not belted, there was a substantial overall increase in proper restraint use of 14.8 percentage points from 2010 among all infants and children observed (46.0% up to 60.8%). The percentage of small children who were properly restrained decreased from 2009 to 2010 by 20.9 percentage points (66.3% to 45.4%) and in 2011 increased to 60.7% being properly restrained when riding with an unbuckled driver. The small number of infants (67) and small children (407) observed with unbelted drivers can result in substantial swings in protection rates from year to year. 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 much more likely to be protected as compared to children riding with unbelted drivers (87.7 versus 60.8%).***

<b>TABLE 3</b>							
<b>Child Restraint Use By Whether or Not the Driver is Belted, 2006-2011</b>							
	<b><u>Percent Properly Restrained</u></b>						
<b><u>Driver Belted</u></b>	<b><u>2006</u></b>	<b><u>2007</u></b>	<b><u>2008</u></b>	<b><u>2009</u></b>	<b><u>2010</u></b>	<b><u>2011</u></b>	<b><u>Change 2010-2011</u></b>
Infants	79.8*	83.2*	69.5*	72.3*	74.2*	64.7*	-9.5
Children	93.6*	95.0*	94.2*	92.5*	93.4*	91.5*	-1.9
Combined	92.2	93.6	91.0	89.9	90.7	87.7*	-3.0
<b><u>Driver Not Belted</u></b>							
Infants	61.1	75.0*	62.9	93.8*	55.0	61.2	+6.2
Children	47.5	36.7*	54.1	66.3*	45.4	60.7	+15.3
Combined	48.2	39.2	54.9	68.4	46.0	60.8	+14.8

\*Differences are statistically significant at the .0001 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 is statistically significant at the .0001 level for 2011.

As in the past, the 2011 study recorded the type of vehicle observed. Vehicles were categorized as automobiles (71.7% of the observations), pickup trucks (14.1%), or vans (14.2%). 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 86.8%, however, this reflects a 6.3 percentage point decrease from 2006, while 83.0% of infants and children riding in automobiles were properly restrained (a 3.2 percentage point decrease from 2006). Combined protection rates in pickup trucks continued to be the lowest at 76.1%; which reflects a 4.3 percentage point decrease from 2006.

In comparison to the 2010 results, the combined rate of proper restraint decreased for vans by 5.2 percentage points (92.0% to 86.8%). The percentage of those riding in automobiles properly restrained decreased by 3.4 points (86.4% to 83.0%) while those in pickups experienced a 3.0 percentage point increase in proper restraint (73.1% to 76.1%).

<b>TABLE 4</b>							
<b>Child Restraint Use By Type of Vehicle, 2006 - 2011</b>							
	<b><u>Percent Properly Restrained</u></b>						
<b><u>Automobiles</u></b>	<b><u>2006</u></b>	<b><u>2007</u></b>	<b><u>2008</u></b>	<b><u>2009</u></b>	<b><u>2010</u></b>	<b><u>2011</u></b>	<b><u>Change 2010-2011</u></b>
Infants	75.9*	85.4	68.7*	73.3*	72.6*	63.2* (N=277)	-9.4
Children	87.3*	85.9	89.8*	89.1*	88.8*	86.6* (N=1,515)	-2.2
Combined	86.2	85.8	87.4	87.1	86.4	83.0* (N=1,792)	-3.4
<b><u>Pickup Trucks</u></b>							
Infants	79.2	45.8*	45.5*	87.0	73.1	60.0 (N=30)	-13.1
Children	80.5	79.8*	71.5*	74.5	73.1	77.6 (N=322)	+4.5
Combined	80.4	77.2	69.7	75.4	73.1	76.1 (N=352)	+3.0
<b><u>Vans</u></b>							
Infants	86.0*	89.5	76.5*	75.0	76.2*	71.4 (N=49)	-4.8
Children	94.1*	90.5	89.3*	94.0	94.0*	89.3 (N=307)	-4.7
Combined	93.1	90.4	86.8	91.7	92.0	86.8 (N=356)	-5.2

\*Differences are statistically significant at the .0001 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 and vans are significant at the .0001 level.

When infants alone are considered, those riding in vans are most likely to be properly restrained (71.4% in 2011). Except for 2009, this has been the case since 2006. While, pickup trucks had the highest rate (87.0%) in 2009, this should be viewed with caution. The number of infants observed in pickups usually is very small (26 in 2010 and 30 in 2011) and the high rate of restraint during 2009 is not at all in line with previous years. Infants in automobiles were properly restrained at a rate of 63.2%.

Of the small children observed in 2011, 89.3% of those in vans were properly restrained, a 4.8 percentage point decrease since 2006. Of those in automobiles, 86.6 were properly restrained, as were 77.6% of small children in pickup trucks. The number of small children properly restrained in pickup trucks has decreased by 2.9 percentage points since 2006 but increased 4.5 points from 2010.

## **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 2006 to 2011. In the current study, the highest rate of child restraint use was found in the Oklahoma City metro area (98.5%), which represents an increase of 9.4 percentage points from the 2010 rate. The second highest protection rate was observed in the Tulsa metro area (88.9%), a 3.2 percentage point increase from last year. These were followed by the Southwest Region (85.7%), Tulsa (81.9%), Oklahoma City (80.9%), Northwest Region (80.6%), Northeast Region (76.9%) and finally, the Southeast Region (72.4%).

Statewide the percentage of properly restrained children decreased 2.7 percentage points from 2010 to 2011 (85.3% to 82.6%). Three of the eight geographic regions increased the rate of those properly restrained in 2011, led by a 9.4 percentage point increase in the Oklahoma City metro area of the state. Five of the areas decreased with substantial decreases in the Northeast Region (down 11.8 points) and the Oklahoma City area (down 5.8 percentage points). The Southeast Region also decreased by 5.6 percentage points in 2011.

When considering changes in statewide child protection rates from 2006 to 2011, the percentage of infants and small children combined who were properly restrained has decreased by 4.1 percentage points. Since 2006, Oklahoma City Metro, Tulsa Metro, and the Southwest Region all have experienced increases in the proper child restraint. These increases have ranged from 4.6 percentage points in the Southwest Region to 1.5 points for the Tulsa metro area.

<b>TABLE 5</b>							
<b>Child Restraint Use By Region (Combined Ages), 2006 - 2011</b>							
<b><u>Region</u></b>	<b><u>Percent Properly Restrained</u></b>						<b><u>Change</u> <u>2010 - 2011</u></b>
	<b><u>2006</u></b>	<b><u>2007</u></b>	<b><u>2008</u></b>	<b><u>2009</u></b>	<b><u>2010</u></b>	<b><u>2011</u></b>	
Statewide, Combined Areas	86.7	85.4	85.0	86.3	85.3	82.6	-2.7
Oklahoma City	92.0	73.8	88.4	96.0	86.7	80.9	-5.8
Oklahoma City Metro	94.5	85.8	94.2	94.2	89.1	98.5	+9.4
Tulsa	86.1	95.5	88.3	85.6	86.7	81.9	-4.8
Tulsa Metro	87.4	96.0	92.6	88.6	85.7	88.9	+3.2
Northeast Region	81.8	90.4	83.8	84.4	88.7	76.9	-11.8
Northwest Region	85.7	81.1	87.4	89.1	84.0	80.6	-3.4
Southeast Region	86.4	84.8	74.4	74.0	78.0	72.4	-5.6
Southwest Region	81.1	79.7	74.3	76.9	82.0	85.7	+3.7
Total Oklahoma City, OKC Metro, Tulsa, and Tulsa Metro	90.2	85.8	90.2	91.5	87.1	86.0	-1.1

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 significantly to 73.8% in 2007, increased substantially in 2008 to 88.4%, increased again in 2009 to 96.0%, decreased to 86.7% in 2010 and decreased again to 80.9% in 2011. 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 2006-2008 to 2009-2011 (Table 6). Averaging data over several years helps smooth out the inter-annual fluctuations.

**TABLE 6**  
**Child Restraint Use By Region (Rolling Averages), 2006-2008 to 2009-2011**

<u>Areas Observed</u>	<u>2006- 2008</u>	<u>2007- 2009</u>	<u>2008- 2010</u>	<u>2009- 2011</u>	<u>Change 2006-2008 to 2009-2011</u>
Statewide, Combined Areas	85.7	85.6	85.5	84.7	-1.0
Oklahoma City	87.7	86.1	90.4	87.9	+0.2
Oklahoma City Metro	91.5	91.4	92.5	93.9	+2.4
Tulsa	90.0	89.8	86.9	84.7	-5.3
Tulsa Metro	92.0	92.4	89.0	87.7	-4.3
Northeast Region	85.3	86.2	85.6	83.3	-2.0
Northwest Region	84.7	85.9	86.2	84.6	-0.1
Southeast Region	81.9	77.7	75.5	74.8	-7.1
Southwest Region	78.4	77.0	78.4	81.5	-3.1
Total Oklahoma City, OKC Metro, Tulsa, and Tulsa Metro areas	88.7	89.2	89.6	88.2	-0.5

Based on the rolling averages, the statewide rate of properly restrained infants and small children has decreased 1.0 percentage points from 2006-2008 to 2009-2011 (85.7% to 84.7%). The rates of those properly restrained have increased in two of the geographic areas over this six-year period when using the rolling averages (Oklahoma City proper and its metro area). The largest increase took place in Oklahoma City Metro (2.4 percentage points). However, proper restraint declined in six of the regions (Tulsa proper and its metro area, and the Northeast, Northwest, Southeast and Southwest Regions). The Southeast Region experienced the largest decrease over this period (7.1 percentage points).

## SUMMARY AND RECOMMENDATIONS

The results of the 2011 survey can be summarized as follows:

- The combined (infants and small children from birth to age 8) statewide rate for proper child restraint use was 82.6%. This is a decrease from 2010 (2.9 percentage points) but very close to the percentage in 2005 (82.7%).
- The percentage of infants and small children not restrained at all in 2011 was 13.2% (up from 11.4% in 2010).
- Infants (birth to one year) were properly restrained at a rate of 64.0% (down from 73.1% in 2010).
- Small children (age 1- 8 years) were properly restrained at a rate of 85.6% (down 1.9 percentage points from 2010).
- Restraint use by infants and children observed in MSAs (86.3%) was substantially higher than those observed in non-MSAs (77.6%).
- White infants and small children were more likely to be properly restrained (83.5%) than were non-white children (77.0%). Except for 2009, this typically is the case.
- Infants and small children traveling in vans and automobiles were more likely to be properly restrained (86.8% and 83.0%, respectively) than those riding in pickup trucks (76.1%).
- 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 (87.7% properly restrained) than when the driver was not belted (60.8% of children properly restrained) - a 26.9 percentage point difference.
- When comparing geographic regions the Oklahoma City Metro, Southwest Region, and Tulsa Metro experienced the highest increase of child restraint use (9.4, 3.7, and 3.2 percentage point increases, respectively). The Northeast Region, Oklahoma City, Southeast Region, Tulsa proper, and Northwest Region experienced the largest decrease of child restraint use (11.8, 5.8, 5.6, 4.8, and 3.4 percentage point decreases, respectively).

- When examining three-year rolling averages from 2006-2008 to 2009-2011, two of the eight geographic areas have seen an increase in the rate of proper restraint. The largest increases have been in Oklahoma City Metro (2.4 percentage points) and Oklahoma City proper (0.2 percentage points). The other six geographic areas experienced decreases, the greatest of which was the Southeast Region (declined by 7.1 percentage points) and Tulsa proper fell by 5.3 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 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 (2010) notes in its *Children Age 1-8 in 2009 Crashes Fact Sheet* report there were 3,533 child passengers in passenger vehicles and pickup trucks involved in crashes. Of these, sixteen were killed and 1,401 were injured. Three of the fatalities were not restrained, two infants were restrained improperly (forward facing child restraint) and two children were restrained by a lap belt only (proper restraint once the child is 4'9" tall and over 70 pounds). The majority of child passenger fatalities occurred in 4-door passenger vehicles and SUVs in 2009 crashes.

Overall, the proportion of infants and small children who are properly restrained has been relatively stable since 2006, ranging from 82.6% to 86.7%. In light of the data collected in the 2011 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**

**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:** \_\_\_\_\_ **within 1 mile of the original site locale.**

**Start Time:** \_\_\_\_\_

**End Time** \_\_\_\_\_

INFANT OR CHILD							DRIVER	
	Child's Age I=Infant (to 1 yr.) C=Child (+1-8 yrs.)	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/Jee p V=Van	Gender M=Male F=Female U=Unsure	Belted Y=Yes N=No
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8								
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INFANT OR CHILD							DRIVER	
	Age I=Infant (up to 1 year) C=Child (+1-8 yrs.)	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/Jet p V=Van	Gender M=Male F=Female U=Unsure	Belted Y=Yes N=No
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Please add any comments/notes:

## **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 100 observation 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 <sup>nd</sup> at Penn)
2.	Babies R' Us (1731 Belle Isle Blvd.)
3.	Academy Sports/Chuck E Cheese (I-240 at Walker)
4.	McDonald's (NW 23 <sup>rd</sup> at Penn)
5.	SW Medical Center Complex (SW 59 <sup>th</sup> at May)
6.	Target (SW 44 <sup>th</sup> at Western)
7.	WalMart Supercenter (I-240 at Santa Fe)
8.	WalMart (NW 23 <sup>rd</sup> at MacArthur)
9.	Target (7012 NW Expressway)
10.	Science Museum (2101 NE 50 <sup>th</sup> )
11.	Sonic/McDonald's (NE 63 <sup>rd</sup> 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.	7-11 Store (2845 NE 10 <sup>th</sup> St.)
16.	Braums (I-240 at S. May)
17.	Oklahoma City Zoo (NE 50 <sup>th</sup> at Martin Luther King Blvd.)
18.	Braum's (436 SW 59 <sup>th</sup> )

<u>Site</u>	<u>Oklahoma City Metro (11)</u>
19.	Edmond: Braum's/WalMart (15 <sup>th</sup> at I-35)
20.	Edmond: Super Target (1200 E. 2 <sup>nd</sup> 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 <sup>th</sup> Street)
24.	Midwest City: WalMart (Reno at Sooner Rd.)
25.	Midwest City: Crest Center (E. Glenhaven at E. Reno)
26.	Moore: WalMart (S.E. 19 <sup>th</sup> at I-35)
27.	Mustang: WalMart (Highway 152)
28.	Yukon: WalMart (10 W. Main)
29.	Bethany: Homeland (NW 23 <sup>rd</sup> at Rockwell)

<u>Site</u>	<u>Tulsa (15)</u>
30.	Woodland Hills Mall (7021 S. Memorial)
31.	WalMart (81 <sup>st</sup> at Lewis)
32.	Chunky Cheeze (7108 S. Memorial)
33.	Toys R' Us (Eastland Plaza 14002 E. 21st)
34.	Tulsa Promenade Mall (41 <sup>st</sup> Street at Yale)
35.	Braum's (1308 S. Garnett Rd.)
36.	McDonald's (1300 S. Harvard)
37.	Big Splash Water Park/Centennial Plaza (21 <sup>st</sup> Street at Yale)
38.	WalMart (5310 S. Elm Place)
39.	Braum's (5048 S. 33 <sup>rd</sup> West Ave.)
40.	Food Pyramid (5151 S. Harvard)
41.	McDonald's (5100 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 <sup>st</sup> at Utica)

Site Tulsa Metro (7)  
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<sup>th</sup> St. North at 117<sup>th</sup> 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: Curt's Plaza (2909 Old Shawnee Road)  
58. Muskogee: McDonald's (101 S. 32<sup>nd</sup> Street)  
59. Muskogee: KFC/Long John Silver's (W. Shawnee@Main St.)  
60. Stillwater: McDonald's (920 W. 6<sup>th</sup>) 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<sup>rd</sup> 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 Highway. – Highway 75 South)

Site Lawton (4)  
72. Central Mall (2<sup>nd</sup> at C Streets)  
73. McDonald's (Lee at 11<sup>th</sup>)  
74. Shopping Center Strip Mall (Sheridan at Gore)  
75. WalMart (NW 38<sup>th</sup> at Cache Road)

Site Southeast (10)  
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 Supercenter (1715 N. Commerce)  
81. Ardmore: Burger King (Broadway at I-35)  
82. Durant: WalMart (3712 W. Main)  
83. Hugo: WalMart/McDonalds (US 70)  
84. Pauls Valley: WalMart Supercenter (I-35 exit toward downtown)  
85. Idabel: WalMart (901 SE Washington)

Site Northwest (5)  
86. Woodward: WalMart (3215 Williams Ave.)  
87. Woodward: Braum's (2802 W. Oklahoma)  
88. Woodward: McDonald's (2720 W. Oklahoma)  
89. Alva: WalMart (Highway 64, East side of town)  
90. Guymon: United Grocery (US 64 N.)

Site Southwest (10)

- 91. Duncan: Braum's (US 81 N.)
- 92. Duncan: Homeland (US 81 N.)
- 93. Duncan: WalMart (US 81 N.)
- 94. Chickasha: McDonald's (2027 S. 4<sup>th</sup> St.)
- 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<sup>th</sup>)
- 100. Weatherford: WalMart (I-40 exit toward town-1349 E. Eagle Dr.)

**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**

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 (2010). 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) Record the date, day of week, and time of observations;
- 2) Record the exact location of each site;
- 3) Record the age (infant or small child) and race (white or non-white) of the child;
- 4) Record whether or not the child was restrained, the type of restraint, and the direction the child was facing in the vehicle;
- 5) Record the type of vehicle (automobile, SUV/Jeep, pickup, or van); and,
- 6) 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 four week period between the hours of 6:00 a.m. and 9:00 p.m.