



Illinois Department of Transportation

Division of Traffic Safety
3215 Executive Park Drive / P.O. Box 19245 / Springfield, Illinois / 62794-9245

TECHNICAL REPORT

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Child Safety Seat Usage In Illinois

July 2006 Observational Survey Results

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Illinois Department of Transportation Division of Traffic Safety Evaluation Unit

The Evaluation Unit within the Division of Traffic Safety in the Illinois Department of Transportation focuses on evaluation and monitoring of various highway safety projects and programs in Illinois. The Evaluation Unit conducts research and analyses that enhance the safety and efficiency of transportation by understanding the human factors that are important to transportation programs in Illinois. The main functions of the Unit include the following:

1. Develop an in-depth analysis of motor vehicle related fatalities and injuries in Illinois using several crash related databases (Crash data, FARS, Trauma Registry, Hospital data, and state and local police data).
2. Develop measurable long term and short term goals and objectives for the Highway Safety Program in Illinois using historical crash related databases.
3. Evaluate each highway safety project with enforcement components (e.g., Traffic Law Enforcement Program, Local Alcohol Program, IMAge projects) using crash and citation data provided by local and state police departments.
4. Evaluate several highway safety programs (e.g., Occupant Protection and Alcohol). This involves evaluating the effects of public policy and intervention programs that promote safe driving.
5. Design and conduct annual observational safety belt and child safety seat surveys for Illinois. The safety belt survey is based on a multi-stage random selection of Interstate Highways, US/IL Highways, and several local and residential streets.
6. Provide results of research and evaluation as well as annual enforcement activities to the National Highway Traffic Safety Administration (NHTSA) as part of the Federal Requirements of State Highway Safety Program in Illinois.
7. Provide statistical consultation to other Sections at the Division of Traffic Safety and other Divisions at IDOT.
8. Publish results of all research and evaluation at the Division and place them as PDF files at IDOT's Website.

This report provides a descriptive analysis of child safety seat usage in Illinois. The survey was an observational survey conducted statewide during July 2006 at selected survey locations which included Day Care Centers, Health Care Centers, McDonald's restaurants, and Shopping Malls. This survey provided a statistically representative sample of child safety seat usage in the State of Illinois.

The report was compiled and prepared by the Evaluation staff. Comments or questions may be addressed to Mehdi Nassirpour, Ph.D., Chief of Evaluation Unit, Bureau of Administrative Services, Division of Traffic Safety, Illinois Department of Transportation, 3215 Executive Park Drive, Springfield, Illinois 62794-9245.

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Executive Summary

In 2006, IDOT has revised the definition of an incorrect child restraint use. An incorrect child restraint use includes seat faces wrong way, harness loose or not used, retainer clip below armpit level, seat not secured, belt across face, and safety belt under arm. Therefore as result of this change, the correct restraint usage rate declined significantly. Therefore comparing the current usage rates to the rates in previous years should be done with caution.

1. During July 2006, a total of 2,859 children were observed in 2,147 passenger cars, pickup trucks, and vans at selected Day Care Centers, McDonald's restaurants, Health Care Centers, and Shopping Malls across Illinois.
2. The total observed safety seat usage rate was 85.4 percent. When only including the observations where the safety seat was used properly, the usage rate drops to 53.9 percent.
3. The Collar Counties had the highest percentage of restrained children at 88 percent. Restraint use for the Downstate Counties was 86.7 percent. Cook County had the lowest percentage of restraint use at 82.4 percent. When only including proper seat belt use across the three regions, the Collar Counties had the highest usage rate at more than 62 percent. On the other hand, the percentage of properly restrained children in Cook County and the Downstate Counties was just over 50 percent.
4. Shopping Malls had the highest percentage of restrained children and properly restrained children of more than 89 percent and 60 percent respectively. Day Care Centers had the second highest percentage of restrained and properly restrained children of more than 85 percent and 53 percent respectively. At Health Care Centers more than 82 percent of children were restrained and only 45 percent of children were properly restrained. At McDonald's restaurants, more than 80 percent of children were restrained and only 50.8 percent of children were properly restrained.
5. Based on vehicle type, vans had the highest percentage of children who were restrained and properly restrained of more than 88 percent and 63 percent respectively. In automobiles, the child safety seat usage rate was 84.6 percent, while only 52.5 percent of children were properly restrained. In pickup trucks, the child safety seat usage rate was more than 79 percent and the percentage of properly restrained children was 42.2 percent.
6. Based on gender, female drivers belted drivers had higher child safety restraint usage rates and proper child restraint usage rates than male drivers (87.6 percent and 55.2 percent versus 80 percent and 51.6 percent respectively).

7. As was expected, belted drivers had higher child safety restraint usage rates and proper child restraint usage rates than unbelted drivers (91.6 percent and 62.3 percent versus 62.4 percent and 25.8 percent respectively).

Survey Design

Using a multi-stage random sampling technique, a total of 2,859 children were observed in 2,150 passenger cars and pickup trucks in Illinois in 2006. There were a total of 110 randomly selected survey locations: 41 Day Care Centers, 12 Health Care Centers, 29 McDonald's restaurants, and 28 Shopping Malls within 12 selected counties. The counties were grouped into three different regions which included Cook County, the Collar Counties (Dupage, Kane, Lake, McHenry, and Will), and the Downstate Counties (Champaign, Macon, Montgomery, Peoria, Rock Island, and St. Clair). The survey design had four characteristics:

1. The survey was conducted between 6:30 a.m. and 6:00 p.m. when the light was adequate for observation.
2. The survey was restricted to a total of 30 observations or an hour of observation per site.
3. The survey was conducted at the exit/entrance of selected locations.
4. The survey included the following common misuses of child safety seats:
 - seat faces wrong way,
 - harness loose or not used,
 - retainer clip below armpit level,
 - seat not secured,
 - belt across face, and
 - safety belt under arm.

For more information on the design of the survey refer to "Design of the Child Safety Seat Survey", Division of Traffic Safety, Illinois Department of Transportation (IDOT), June 1996.

Results of Child Safety Seat Survey in Illinois

In 2006, IDOT has revised the definition of an incorrect child restraint use. An incorrect child restraint use includes seat faces wrong way, harness loose or not used, retainer clip below armpit level, seat not secured, belt across face, and safety belt under arm. Therefore as result of this change, the correct restraint usage rate declined significantly. Therefore comparing the current usage rates to the rates in previous years should be done with caution.

Tables 1 through 7 provide descriptive information on the child safety seat usage rate and its correlates in Illinois in 2006.

Table 1 shows that the overall child restraint usage rate in Illinois is 85.4 percent. After excluding total number of observations in which the child restraint is used incorrectly, the usage rate is reduced to 53.9 percent. As was expected, child safety restraint usage rates are inversely proportional to the number of children in the car. It is likely to see usage rates decrease as the number of children in the vehicle increase. This trend can be seen in **Table 1**. The usage rate and correct usage rate for Child 1 are 87.4 percent and 55.3 percent respectively. On the other hand, these percentages are lower for Child 3 at 76.5 percent and 38.3 percent respectively.

Table 1: Child Safety Seat Usage Rate in Illinois

Seating Position	No Restraint	Incorrect Use	Correct Use	Total Observed	Usage Rate Total	Usage Rate (excludes incorrect use)
Child 1	270	690	1,186	2,146	87.4%	55.3%
Child 2	125	172	318	615	79.7%	51.7%
Child 3	19	31	31	81	76.5%	38.3%
Child 4	3	4	4	11	72.7%	36.4%
Total	417	897	1,539	2,853	85.4%	53.9%

Note: Common misuses of child safety seats include seat faces wrong way, harness loose or not used, retainer clip below armpit level, seat not secured, belt across face, and safety belt under arm.

Table 2 presents frequency and percentage distributions for selected demographics, including type of vehicle, driver's gender, driver's belt status, and total vehicles observed by site type. As expected, the largest percentage of vehicles observed were automobiles (70.3 percent); the second largest percentage of vehicles observed were vans (19.7 percent); and the lowest percentage of vehicles observed were pickup trucks (9.9%). Based on driver's gender, more than 64 percent of the drivers observed were female, while only 35.2 percent of the observations were male. Based on driver's belt status, more than 79 percent of drivers were observed wearing their seat belts, while the remaining 21 percent were unbelted. Based on location type, the largest percentage of vehicles was observed at Day Care Centers (38 percent). More than 28 percent of the vehicles were observed at Shopping Malls and more than 26 percent were observed at McDonald's restaurants. The smallest percentage of vehicles was observed at Health Care Centers (7.3 percent).

**Table 2: Frequency and Percentage Distribution
of Selected Demographics for the
2006 Child Safety Seat Survey**

Type of Vehicle		
Type of Vehicle	Frequency	Percentage
Automobile	1,510	70.3%
Truck	213	9.9%
Van	424	19.7%
TOTAL	2,147	100.0%
Driver's Gender		
Driver's Gender	Frequency	Percentage
Female	1,389	64.8%
Male	756	35.2%
TOTAL	2,145	100.0%
Driver's Belt Status		
Driver's Belt Status	Frequency	Percentage
Belted	1,687	79.1%
Not Belted	447	20.9%
TOTAL	2,134	100.0%
Total Vehicles Observed by Location Type		
Location Type	Frequency	Percentage
Daycare	816	38.0%
Health Center	156	7.3%
McDonald's	561	26.1%
Shopping Mall	617	28.7%
TOTAL	2,150	100.0%
TOTAL	2,150	100.0%

*Note: The Totals are different for each demographic due to missing values.
Due to rounding error, percentages may not equal 100 percent.

**Table 3: Analysis of the 2006 Child Safety Seat Survey
Child Restraint Status by Region**

Child Restraint Status	Region						Totals	
	Collar Counties**		Cook County		Downstate Counties***			
	N	%	N	%	N	%	N	%
Properly Restrained	476	62.6%	699	50.9%	364	50.6%	1,539	53.9%
Incorrectly Restrained	193	25.4%	432	31.5%	260	36.1%	885	31.0%
Total Restrained*	669	88.0%	1,131	82.4%	624	86.7%	2,424	85.0%
Not Restrained	91	12.0%	242	17.6%	96	13.3%	429	15.0%
<i>Column Totals</i>	760	100%	1,373	100%	720	100%	3,380	100%

* The row 'Total Restrained' is the sum of the cases from the rows 'Properly Restrained' and 'Incorrectly Restrained'

** The Collar Counties are comprised of DuPage, Kane, Lake, McHenry, & Will

*** The Downstate Counties are comprised of Champaign, Macon, Montgomery, Peoria, Rock Island, & St. Clair

Table 3 shows frequency and percentage distributions of child restraint use by selected regions of Illinois (Collar Counties, Cook County, and Downstate Counties). The Collar Counties had the highest percentage of child restraint use at 88 percent; the Downstate Counties had a child restraint usage rate of more than 86 percent; while Cook County had the lowest child restraint usage rate at 82.4 percent. The three regions had approximately the same percentage of children who were properly restrained. Proper child restraint use ranged from 50.6 percent in the Downstate Counties to 62.6 percent in the Collar Counties.

Table 4 provides information on child restraint usage rates by location type. The location types included Day Care Centers, Health Care Centers, McDonald's restaurants, and Shopping Malls. Shopping Malls had the highest percentage of children who were restrained at 89.4 percent, as well as, the highest percentage of children who were properly restrained at 60.1 percent. Day Care Centers had the second highest percent of children who were restrained and properly restrained at 85.5 percent and 53 percent respectively. Total restraint use was more than 80 percent at both Health Care Centers and McDonald's restaurants, but proper restraint use was higher at McDonald's restaurants (50.8 percent) than Health Care Centers (45.2 percent).

**Table 4: Analysis of the 2006 Child Safety Seat Survey
Child Restraint Status by Location Type**

Child Restraint Status	Location Type								Totals	
	Day Care Center		Health Care Center		McDonald's		Shopping Mall			
	N	%	N	%	N	%	N	%	N	%
Properly Restrained	540	53.0%	98	45.2%	391	50.8%	510	60.1%	1,539	53.9%
Incorrectly Restrained	331	32.5%	81	37.3%	225	29.3%	248	29.2%	934	31.0%
Total Restrained*	871	85.5%	179	82.5%	616	80.1%	758	89.4%	2,965	85.0%
Not Restrained	148	14.5%	38	17.5%	153	19.9%	90	10.6%	415	15.0%
<i>Column Totals</i>	1,019	100%	217	100%	769	100%	848	100%	3,380	100%

* The row 'Total Restrained' is the sum of the cases from the rows 'Properly Restrained' and 'Incorrectly Restrained'

Table 5 shows child restraint use by vehicle type, including automobiles, pickup trucks, and vans. Vans had the highest percentage of children who were restrained and properly restrained at 88.8 percent and 63.8 percent respectively. Automobiles had more than 84 percent of children restrained. When excluding incorrect use, the child safety seat usage rate in automobiles is 52.5 percent. The child safety seat usage rate for pickup trucks was 79.4 percent. When excluding incorrect use, the child safety seat usage rate in pickup trucks is 42.2 percent.

**Table 5: Analysis of the 2006 Child Safety Seat Survey
Child Restraint Status by Vehicle Type**

Child Restraint Status	Vehicle Type						Totals**	
	Automobile		Truck		Van			
	N	%	N	%	N	%	N	%
Properly Restrained	1,023	52.5%	117	42.2%	398	63.8%	1,538	54.0%
Incorrectly Restrained	624	32.0%	103	37.2%	156	25.0%	883	31.0%
Total Restrained*	1,647	84.6%	220	79.4%	554	88.8%	2,421	85.0%
Not Restrained	300	15.4%	57	20.6%	70	11.2%	427	15.0%
<i>Column Totals</i>	1,947	100%	277	100%	624	100%	2,848	100%

* The row 'Total Restrained' is the sum of the cases from the rows 'Properly Restrained' and 'Incorrectly Restrained'

** The total does not equal 2,859 cases due to missing data.

Table 6 shows that female drivers tended to have higher restraint usage rates and proper usage rates than males. When a female was driving, more than 87 percent of children were restrained, while only 55 percent of those children were properly restrained. On the other hand, when a male was driving, only 80 percent of children were restrained, while only 52 percent of those children were properly restrained.

**Table 6: Analysis of the 2006 Child Safety Seat Survey
Child Restraint Status by Driver's Gender**

Child Restraint Status	Driver's Gender				Totals**	
	Male		Female		N	%
	N	%	N	%		
Properly Restrained	501	51.6%	1,034	55.2%	1,535	54.0%
Incorrectly Restrained	276	28.4%	605	32.3%	881	31.0%
Total Restrained*	777	80.0%	1,639	87.6%	2,416	85.0%
Not Restrained	194	20.0%	233	12.4%	427	15.0%
<i>Column Totals</i>	971	100%	2,046	100%	2,843	100%

* The row 'Total Restrained' is the sum of the cases from the rows 'Properly Restrained' and 'Incorrectly Restrained'

** The total does not equal 2,859 cases due to missing data.

Table 7 shows frequency and percentage distributions of child restraint use by driver's belt status. As indicated earlier (**Table 2**), more than 79 percent of all drivers observed with children in their vehicles were wearing their seat belts (1,687 belted drivers divided by 2,134 total observations multiplied by 100 percent). Belted drivers have significantly higher child safety seat usage rates and proper child safety seat usage rates than unbelted drivers. When a driver was wearing their seat belt, more than 91 percent of children were restrained. When excluding incorrect use, only 62 percent of these children were properly restrained. On the other hand, unbelted drivers tend have significantly lower child restraint usage rates than belted drivers. When a driver was not wearing their seat belt, only 62 percent of children were restrained. When excluding incorrect use, approximately 26 percent of these children were properly restrained.

**Table 7: Analysis of the 2006 Child Safety Seat Survey
Child Restraint Status by Driver's Belt Status**

Child Restraint Status	Driver's Belt Status				Totals**	
	Driver Belted		Driver Unbelted		N	%
	N	%	N	%		
Properly Restrained	1,369	62.3%	164	25.8%	1,533	54.1%
Incorrectly Restrained	644	29.3%	232	36.5%	876	27.8%
Total Restrained*	2,013	91.6%	396	62.4%	2,409	87.7%
Not Restrained	185	8.4%	239	37.6%	424	12.3%
<i>Column Totals</i>	2,198	100%	635	100%	2,833	100%

* The row 'Total Restrained' is the sum of the cases from the rows 'Properly Restrained' and 'Incorrectly Restrained'

** The total does not equal 3,380 cases due to missing data.

Historical Trends of Child Safety Seat Use

As indicated earlier due to the change in the definition of the incorrect restraint use, comparing the current usage rates to the rates in previous years should be done with caution. The following tables will provide data and information on the child restraint use over five survey periods when the IDOT conducted statewide child safety seat surveys.

**Table 8: Child Safety Seat Usage in Illinois
(Comparison of 1997, 2001, 2003, 2005 & 2006)**

Child Number	Total Usage Rate of Restrained Children						Correct Usage Rate of Restrained Children (excludes Incorrect Use)					
	Total Use (1997)	Total Use (2001)	Total Use (2003)	Total Use (2005)	Total Use (2006)	% Change (1997-2006)	Proper Use (1997)	Proper Use (2001)	Proper Use (2003)	Proper Use (2005)	Proper Use (2006)	% Change (1997-2006)
Total	66.8%	78.0%	83.0%	87.7%	85.4%	18.6%	52.2%	54.8%	60.0%	60.1%	53.9%	1.7%
Child #												
Child 1	69.0%	81.0%	85.3%	89.4%	87.4%	18.4%	53.5%	57.3%	61.8%	61.7%	59.3%	5.8%
Child 2	59.6%	74.5%	80.0%	85.3%	79.7%	20.1%	48.6%	51.6%	58.3%	57.3%	51.7%	3.1%
Child 3	35.6%	51.1%	64.9%	75.0%	76.5%	40.9%	24.4%	30.4%	42.5%	50.0%	38.3%	13.9%
Child 4	20.0%	27.3%	50.0%	60.0%	72.7%	52.7%	20.0%	22.7%	40.0%	46.7%	36.4%	16.4%

* Percent Change is calculated by subtracting the 1997 usage rates from the 2006 usage rates.

Note: Common misuses of child safety seats include seat faces wrong way, harness loose or not used, retainer clip below armpit level, seat not secured, belt across face, and safety belt under arm.

Table 8 provides information about total child restraint usage rates and proper usage rate for 1997, 2001, 2003, 2005 and 2006. From 1997 to 2006, there was an increase of 18.6 percentage points for the child restraint usage rate (from 66.8 percent in 1997 to 85.4 percent in 2006). The child safety seat usage rate for children who were correctly restrained only increased by 1.7 percentage points (from 52.2 percent in 1997 to 53.9 percent in 2006). Percentage point increases for overall usage rates for all children ranged from 18.4 for Child 1 to 52.7 for Child 4. Percentage point increases for proper child restraint usage rates ranged from 5.8 for Child 1 to 16.4 for Child 4.

Table 9 shows comparative analyses of child safety seat usage rates for 1997, 2001, 2003, 2005 and 2006. The data has been analyzed by selected demographics

including region, location, vehicle type, driver's gender, and driver's belt status. The information in **Table 9** is displayed in graphic presentations of child safety seat usage rates by selected characteristics in **Figures 1 through 5**.

Figure 1 shows the proper child safety restraint usage rate by the selected regions in Illinois. Only the Collar Counties had an increase in proper child safety restraint use, while Cook County and the Downstate Counties had slight decreases in proper child safety restraint use. From 1997 to 2006, the proper child safety seat usage rate in the Collar Counties increased from 48.3 percent in 1997 to 62.6 percent in 2006. On the other hand, the proper child safety seat usage rate in Cook County and the Downstate Counties decreased from 1997 to 2006. In Cook County, the proper child safety restraint usage rate decreased from 52.3 percent in 1997 to 50.9 percent in 2006 (a 1.4 percentage point decrease). In the Downstate Counties, the proper child safety restraint usage rate decreased from 58 percent in 1997 to 50.6 in 2006 (a 7.4 percentage point decrease).

Figure 2 shows the proper child safety restraint usage rate by location type in Illinois. From 1997 to 2006, proper child safety restraint use has increased at Shopping Malls and McDonald's restaurants, while it has decreased at Day Care Centers and Health Care Centers. The proper child safety restraint usage rate at shopping malls increased from 52.6 percent in 1997 to 60.1 percent in 2006 (an increase of 7.5 percentage points). At McDonald's restaurants, the proper child safety restraint usage rate increased from 44.7 percent in 1997 to 50.8 percent in 2006 (an increase of 6.1 percentage points). On the other hand, at Day Care Centers the proper child safety restraint usage rate decreased from 57.3 percent in 1997 to 53 percent in 2006 (a decrease of 4.3 percentage points). The proper child safety restraint usage rate decreased from 50.2 percent in 1997 to 45.2 percent in 2006 (a decrease of 5 percentage points).

Figure 3 shows the proper child safety restraint usage rate by vehicle type in Illinois. From 1997 to 2006, the proper child safety restraint usage rate increased in vans and

automobiles, but decreased in pickup trucks. The proper child safety restraint usage rate in vans increased from 58.2 percent in 1997 to 63.8 percent in 2006 (an increase of 5.6 percentage points). In automobiles, it increased from 51.2 percent in 1997 to 52.5 percent in 2006 (an increase of 1.3 percentage points). On the other hand, in pickup truck it decreased from 45.5 percent in 1997 to 42.2 percent in 2006.

Figure 4 shows the proper child safety restraint usage rate by driver's gender in Illinois. From 1997 to 2006, males had a higher rate of increase of proper child restraint use (an increase of 4.4 percentage points) than females (an increase of 0.1 percentage point). Although males had a higher rate of increase, females still had higher usage rates.

Figure 5 shows driver's belt status by correct child safety restraint usage rates across selected years in Illinois. As was expected, the usage rates of child restraints were significantly higher for belted drivers than for unbelted drivers. From 1997 to 2006, there was a decrease of 8.8 percentage points in the proper use of child restraints for belted drivers. For unbelted drivers, there was a 2.4 percentage point decrease in the proper use of child restraints.

Table 9
Correct Child Safety Seat Usage Rates in Illinois
by Selected Characteristics

(excludes Incorrect Use)

Comparison of 1997, 2001, 2003, 2005 & 2006

Selected Characteristics	Correct Usage Rate of Restrained Children (excludes Incorrect Use)					
	Usage Rate (1997)	Usage Rate (2001)	Usage Rate (2003)	Usage Rate (2005)	Usage Rate (2006)	Percent Change (1997-2005)
Statewide	52.2%	54.8%	60.0%	60.1%	54.0%	1.8%
Region						
Cook County	52.3%	59.4%	59.8%	59.1%	50.9%	-1.4%
Collar Counties	48.3%	46.4%	57.7%	62.6%	62.6%	14.3%
Downstate Counties	58.0%	51.6%	63.7%	59.3%	50.6%	-7.4%
Location						
Day Care Center	57.3%	62.5%	67.1%	66.2%	53.0%	-4.3%
Health Center	50.2%	45.8%	48.3%	50.7%	45.2%	-5.0%
McDonald's	44.7%	46.4%	53.6%	57.6%	50.8%	6.1%
Shopping Mall	52.6%	56.5%	61.1%	59.0%	60.1%	7.5%
Vehicle Type						
Automobile	51.2%	53.9%	57.6%	59.1%	52.5%	1.3%
Truck	45.5%	52.7%	52.1%	59.3%	42.2%	-3.3%
Van	58.2%	58.5%	67.7%	75.1%	63.8%	5.6%
Gender						
Male	47.2%	51.7%	59.8%	58.6%	51.6%	4.4%
Female	55.1%	56.5%	60.1%	61.1%	55.2%	0.1%
Driver's Belt Status						
Belted	71.0%	68.2%	71.8%	71.2%	62.6%	-8.8%
Unbelted	28.2%	28.7%	32.9%	25.7%	25.8%	-2.4%

Note: Incorrect Use = seat facing the wrong way, harness not used, seat not secured, and belt across face

Figure 1: Proper Child Safety Seat Usage Rates by Region in Illinois Across Selected Years

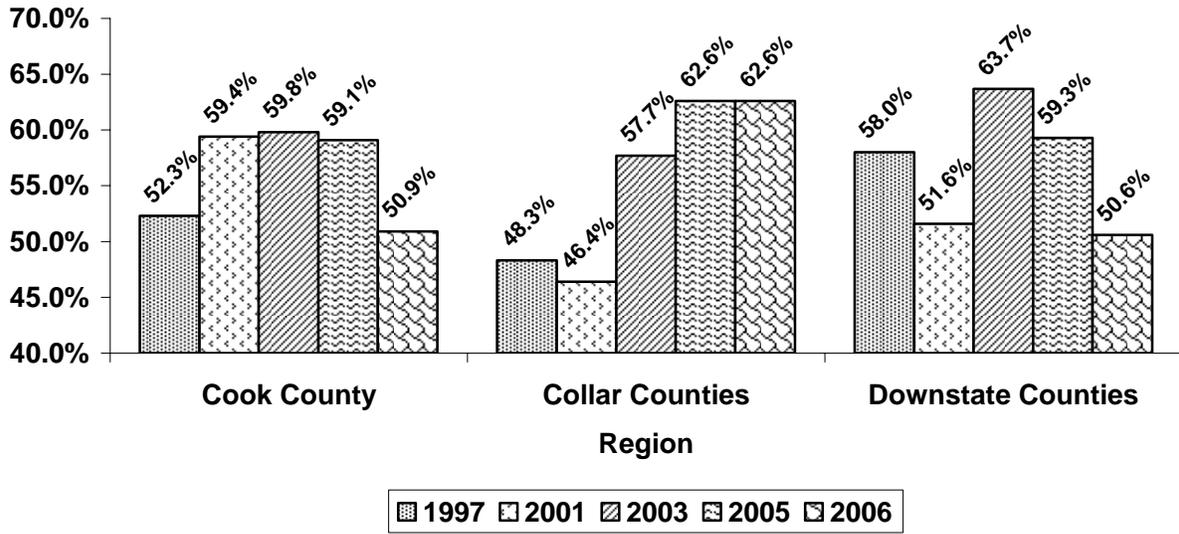


Figure 2: Proper Child Safety Seat Usage Rates by Location Type in Illinois Across Selected Years

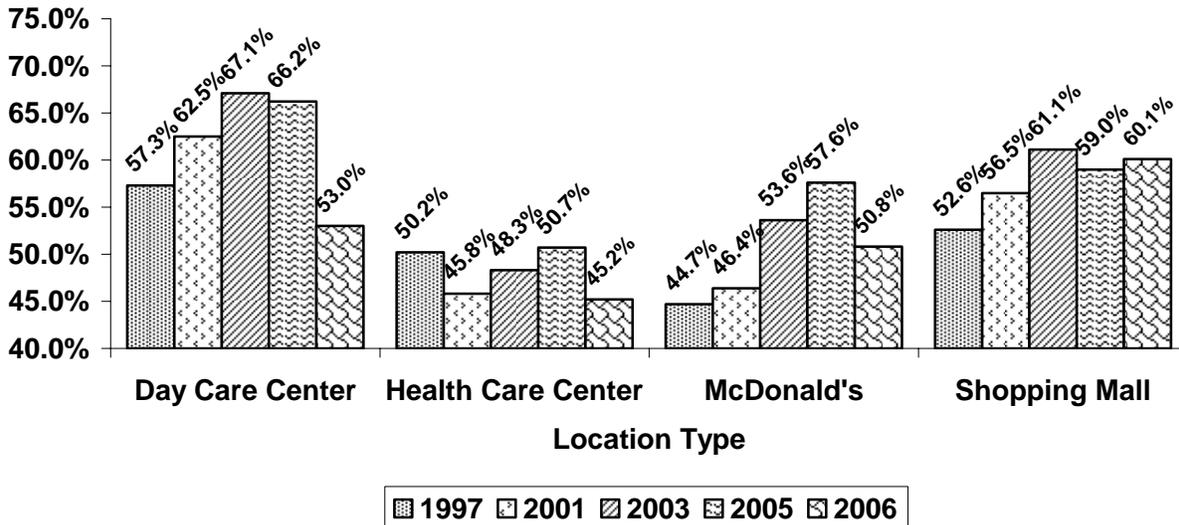


Figure 3: Proper Child Safety Seat Usage Rates by Vehicle Type in Illinois Across Selected Years

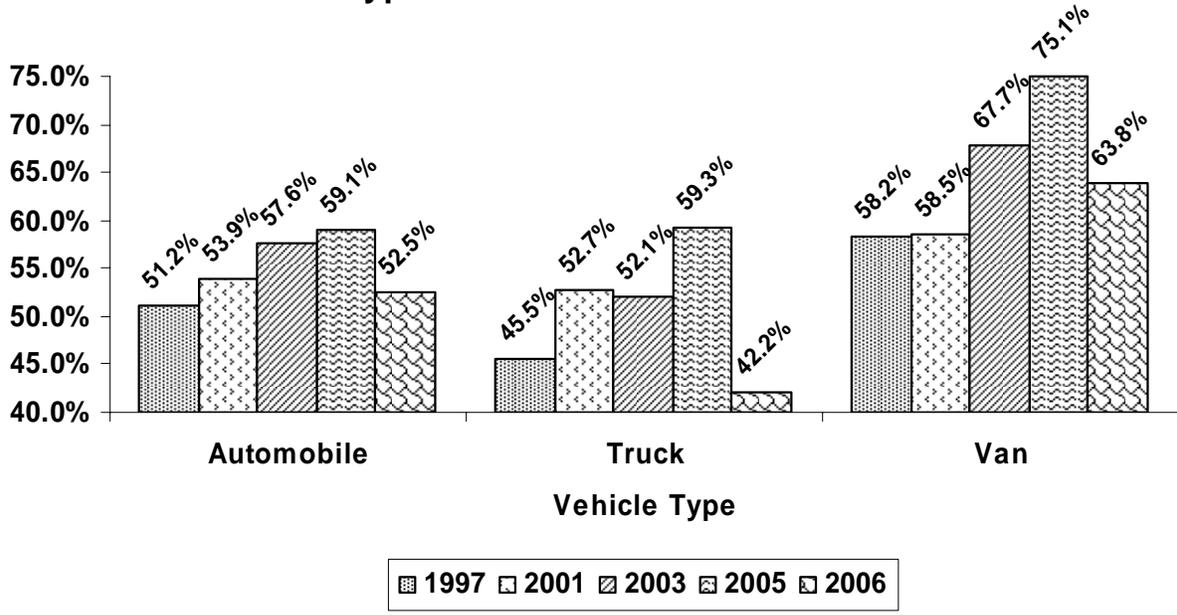


Figure 4: Child Safety Seat Usage Rates by Driver's Gender in Illinois Across Selected Years

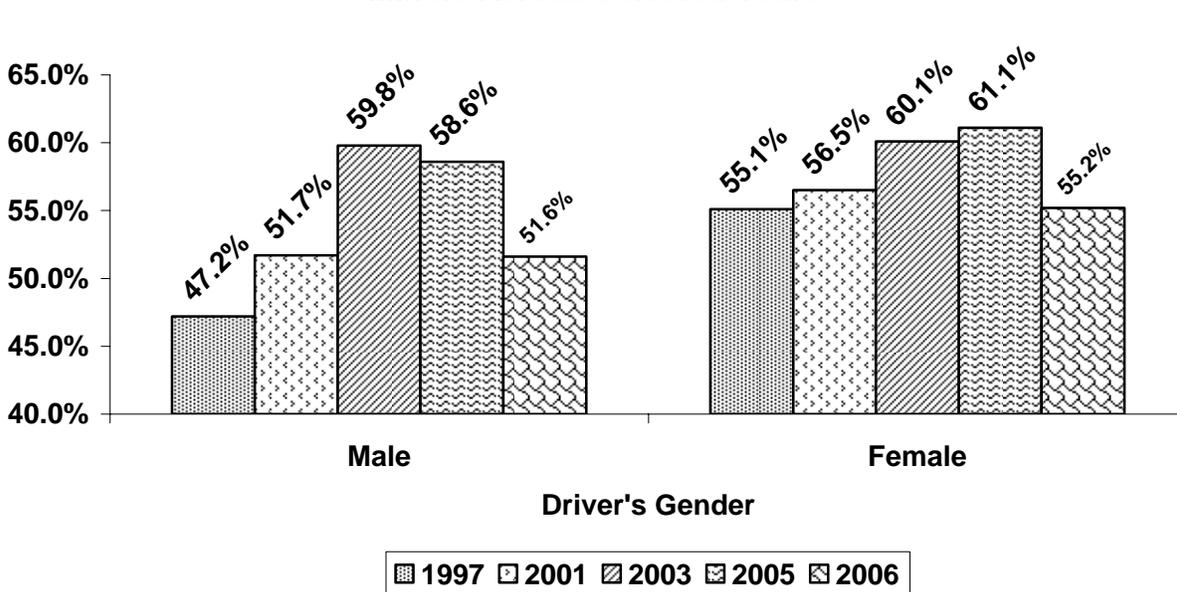


Figure 5: Child Safety Seat Usage Rates by Driver's Belt Status in Illinois Across Selected Years

