

INDIANA TRAFFIC SAFETY FACTS

July 2008



A collision produces three levels of data: collision, unit (vehicles), and individual. For this reason, readers should pay particular attention to the wording of statements about the data to avoid misinterpretations.

Designing and implementing effective traffic safety policies requires data-driven analysis of traffic accidents. To help in the policy-making process, the Indiana University Center for Criminal Justice Research is collaborating with the Indiana Criminal Justice Institute to analyze 2007 vehicle crash data from the Automated Reporting Information Exchange System (ARIES), formally the Vehicle Crash Reporting System (VCRS), maintained by the Indiana State Police. Research findings will be summarized in a series of Fact Sheets on various aspects of traffic collisions, including alcohol-related crashes, light and large trucks, dangerous driving, children, motorcycles, occupant protection, and drivers. An additional publication will provide information on county and municipality data and the final publication will be the annual Indiana Crash Fact Book. These publications serve as the analytical foundation of traffic safety program planning and design in Indiana.

Indiana collision data are obtained from Indiana Crash Reports, as completed by police officers. As of January 1, 2008, approximately 95 percent of all collisions are entered electronically through the ARIES. Trends in collisions incidence as reported in these publications could incorporate the effects of changes to data elements on the Crash Report, agency-specific enforcement policy changes, re-engineered roadways, driver safety education programs and other unspecified effects. If you have questions regarding trends or unexpected results, please contact the Indiana Criminal Justice Institute, Traffic Safety Division for more information.



OCCUPANT PROTECTION 2007

In 2007, 54,464 passenger vehicle occupants¹ were injured or killed in Indiana traffic collisions, 85 percent of whom were wearing proper safety restraints. Only 44 percent of the 669 passenger vehicle occupants fatally injured, however, were properly restrained. Additionally, the rate of restraint usage among individuals suffering incapacitating injuries was less than 66 percent (Table 1). Occupant protection devices (including safety belts, child restraint seats, airbags, and helmets) are designed for the specific purpose of reducing the occurrence and severity of injuries in traffic collisions.² This fact sheet summarizes occupant protection data trends, legislation, and public awareness efforts at the national, state, and local levels with a particular emphasis on restraint use and injuries resulting from passenger vehicle collisions between 2003 and 2007. Indiana data were extracted from the Indiana State Police Automated Reporting Information Exchange System (ARIES), as of March 16, 2008.

NATIONAL OVERVIEW

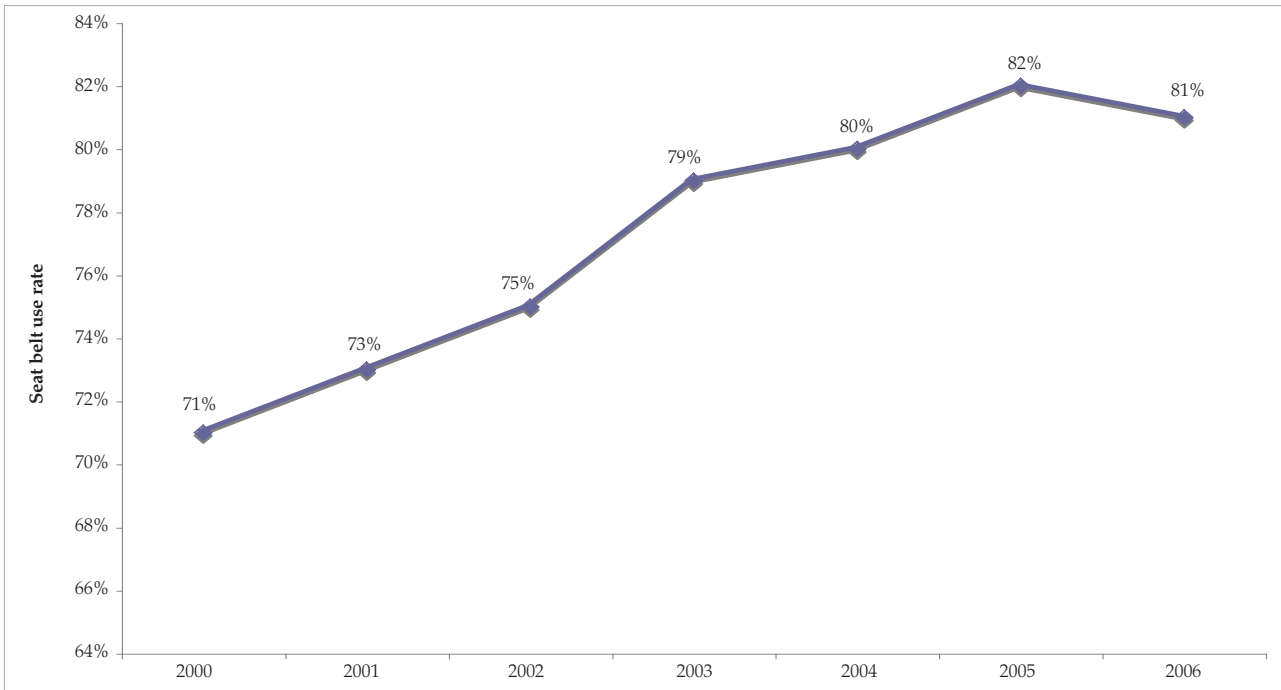
The National Highway Traffic Safety Administration (NHTSA) reports that, nationally in 2006, the overall observed seat belt use rate was 81 percent (Figure 1).³ While this represents a slight decrease from 2005 (82 percent), the national rate of restraint usage has increased 10 percentage points since 2000 (71 percent). In 1994, the observed seat belt use rate in the United States was 58 percent (not shown in figure). NHTSA reports that 55 percent of the 30,521 passenger vehicle occupants killed in 2006 U.S. traffic collisions were unrestrained. In 2006, over 2,900 drivers of pickup trucks were killed in U.S. collisions, 68 percent of whom were unrestrained. Research shows that proper restraint use reduces the risk of fatal injury to passenger car occupants riding in the front seat of the vehicle by 45 percent. Likewise, the use of seat belts among light truck occupants reduces the risk of fatal injury by 60 percent. Proper use of child safety seats reduces the risk of fatal injury by 71 percent among children under the age of 1 and by 54 percent among children between the ages of 1 and 4 years old.

¹Passenger vehicles are defined as those reported as passenger cars, pickup trucks, SUVs, and vans.

²Lisby, K. (2007). *Indiana Traffic Safety Facts: Occupant Protection 2006*, Center for Urban Policy and the Environment, School of Public and Environmental Affairs, IUPUI, May.

³National Center for Statistics and Analysis, National Highway Traffic Safety Administration, *Traffic Safety Facts: Occupant Protection (2006 data)*, Washington, DC. DT HS 810 807.

Figure 1: U.S. Observed seatbelt use rate, 2000 to 2006



Source: National Center for Statistics and Analysis, National Highway Traffic Safety Administration, *National Occupant Protection Use Survey, 2006*

Table 1: Restraint use and injury status among individuals involved in Indiana passenger vehicles collisions, 2003-2007

Passenger vehicle occupant injuries	2003	2004	2005	2006	2007	Average Annual Change
All injured occupants	325,173	323,788	318,219	291,462	304,074	-1.6%
Properly restrained	272,941	275,986	269,263	250,582	271,742	0.0%
<i>Restraint use rate</i>	83.9%	85.2%	84.6%	86.0%	89.4%	1.6%
Fatalities	651	712	711	656	669	0.9%
Properly restrained	291	292	296	261	295	0.7%
<i>Restraint use rate</i>	44.7%	41.0%	41.6%	39.8%	44.1%	-0.1%
Incapacitating injuries	3,382	3,107	2,993	2,911	2,692	-5.5%
Properly restrained	2,247	2,019	1,863	1,884	1,768	-5.7%
<i>Restraint use rate</i>	66.4%	65.0%	62.2%	64.7%	65.7%	-0.2%
Non-incapacitating injuries	48,870	52,217	50,024	45,957	43,435	-2.7%
Properly restrained	39,904	42,887	40,946	38,118	37,523	-1.4%
<i>Restraint use rate</i>	81.7%	82.1%	81.9%	82.9%	86.4%	1.4%
Other injuries	22,843	27,867	32,398	20,413	7,729	-15.2%
Properly restrained	19,492	23,983	27,551	17,326	6,601	-15.3%
<i>Restraint use rate</i>	85.3%	86.1%	85.0%	84.9%	85.4%	0.0%
No injuries	249,427	239,885	232,093	221,525	249,549	0.3%
Properly restrained	211,007	206,805	198,607	192,993	225,555	2.0%
<i>Restraint use rate</i>	84.6%	86.2%	85.6%	87.1%	90.4%	1.7%

Source: Indiana State Police Automated Reporting Information Exchange System (ARIES), as of March 16, 2008

Notes:

Non-incapacitating injuries include those injuries reported as both *non-incapacitating* and *possible*.

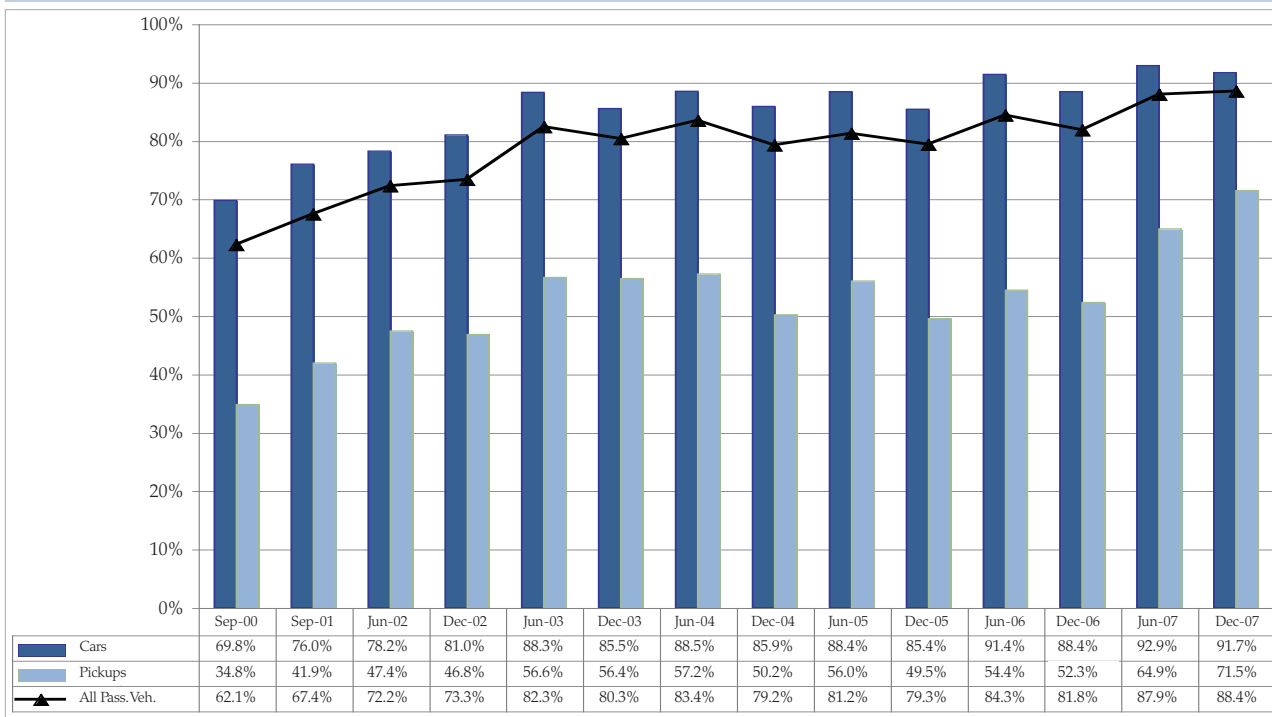
Other injury status includes *not reported*, *unknown*, *refused (treatment)*, and *invalid injury status codes*.

No injury status includes individuals involved in collisions reported as *null* (blank) values in the injury status code field (mainly drivers in property damage only collisions).

Includes only injuries occurring in passenger vehicles (defined as *passenger cars*, *pickup trucks*, *SUVs*, and *vans*). Excludes all other vehicle types including those identified as *pedestrians* and *pedalcyclists*.

For the purposes of this fact sheet, vehicle occupants injured in Indiana collisions are counted as having been restrained when the reporting officer selected any one of the following safety equipment categories on the Indiana Crash Report: (1) *Lap belt only*; (2) *Harness*; (3) *Airbag deployed and harness*; (4) *Child restraint*; or (5) *Lap and harness*.

Figure 2: Indiana observational studies of safety belt usage rates by vehicle type, 2000 to 2007



Source: Indiana Criminal Justice Institute, January 2008

INDIANA OVERVIEW

According to the Indiana Criminal Justice Institute, Indiana observational studies of seat belt usage show an upward trend in restraint usage rates for all passenger vehicles. Figure 2 shows that restraint usage rates for all passenger vehicles increased 26 percentage points from 62 percent in 2000 to over 88 percent in 2007. Likewise, observed rates of restraint use in passenger cars increased from 70 in 2000 to 92 percent in 2007. Pickup trucks experienced the most dramatic improvements in restraint use during this same period, increasing from 35 percent in 2000 to nearly 72 percent in 2007. Between December 2006 (52 percent) and December 2007 (72 percent), restraint usage among pickup truck occupants increased by 19 percentage points. This is likely due in part to the change in the Indiana passenger restraint law in July 2007 requiring all passengers to be properly restrained in all passenger vehicles, including pickup trucks and SUVs (registered as trucks) that were previously exempted from the law.

For the purposes of this fact sheet, vehicle occupants injured in Indiana collisions are counted as having been restrained when the reporting officer selected any one of the following safety equipment categories on the Indiana Crash Report: (1) *Lap belt only*; (2) *Harness*; (3) *Airbag deployed and harness*; (4) *Child restraint*; or (5) *Lap and harness*. By this standard, nearly 90 per-

cent of passenger vehicle occupants injured in 2007 Indiana traffic collisions were wearing the proper safety restraint (Table 1), a rate slightly higher than the December 2007 Indiana observed seat belt use rate (depicted in Figure 2) of 88 percent. The rate of restraint usage among passenger vehicle occupants injured or killed in Indiana crashes increased steadily between 2003 and 2007, while the overall number of injuries decreased during this same period. The number of passenger vehicle occupant injuries decreased annually, on average, nearly 7 percent, with the most dramatic decreases occurring between 2005 (86,093 total injuries) and 2007 (54,464 total injuries). All other injury categories also experienced an average annual decrease in the number of injuries, with the exception of fatalities which saw an average annual increase of less than one percent. Rates of restraint usage among passenger vehicle occupants injured in Indiana traffic collisions were lower for individuals suffering more severe injuries. Among the 669 passenger vehicle occupants killed in 2007 collisions, 44 percent were properly restrained. This represents a four percentage point increase from 2006 (39.8 percent). The rate of restraint usage among the 2,692 individuals suffering incapacitating injuries was less than 66 percent. The average annual rates of change in restraint usage between 2003 and 2007 were low across all injury categories.

Table 2. Passenger vehicle occupants involved in collisions by vehicle type, restraint use, and injury status, 2007

Restraint use and injury status	Passenger cars		Pickup trucks		SUVs		Vans	
	Count	% Total	Count	% Total	Count	% Total	Count	% Total
Restrained (R)	167,313	100.0	40,465	100.0	40,219	100.0	23,745	100.0
Fatal	201	0.1	39	0.1	22	0.1	33	0.1
Incapacitating	1,187	0.7	200	0.5	238	0.6	143	0.6
Non-incapacitating	24,784	14.8	3,913	9.7	5,448	13.5	3,378	14.2
Other	3,848	2.3	1,045	2.6	1,066	2.7	642	2.7
No injury	137,293	82.1	35,268	87.2	33,445	83.2	19,549	82.3
Not restrained (NR)	3,795	100.0	3,486	100.0	1,097	100.0	620	100.0
Fatal	134	3.5	79	2.3	60	5.5	19	3.1
Incapacitating	331	8.7	179	5.1	116	10.6	36	5.8
Non-incapacitating	1,772	46.7	1,134	32.5	490	44.7	271	43.7
Other	83	2.2	79	2.3	24	2.2	16	2.6
No injury	1475	38.9	2015	57.8	407	37.1	278	44.8
Relative risk of serious injury (% NR / % R)								
Fatal	29.4		23.5		100.0		22.1	
Incapacitating	12.3		10.4		17.9		9.6	

Source: Indiana State Police Automated Reporting Information Exchange System (ARIES), as of March 16, 2008

Notes:

Non-incapacitating injuries include those injuries reported as both non-incapacitating and possible.

Other injury status includes not reported, unknown, refused (treatment), and invalid injury status codes.

No injury status includes individuals involved in collisions reported as null (blank) values in the injury status code field (mainly drivers in property damage only collisions).

Includes only injuries occurring in passenger vehicles (defined as passenger cars, pickup trucks, SUVs, and vans). Excludes all other vehicle types including those identified as pedestrians and pedalcyclists.

For the purposes of this fact sheet, vehicle occupants injured in Indiana collisions are counted as having been restrained when the reporting officer selected any one of the following safety equipment categories on the Indiana Crash Report: (1) Lap belt only; (2) Harness; (3) Airbag deployed and harness; (4) Child restraint; or (5) Lap and harness.

Table 3: Restraint use by age group and injury status in Indiana collisions, 2007

Age group	All injuries			Fatal injuries			Incapacitating injuries		
	Number	Total properly restrained	Restraint use rate	Number	Total properly restrained	Restraint use rate	Number	Total properly restrained	Restraint use rate
< 1	825	521	63.2	2	1	50.0	9	7	77.8
1 - 3	553	503	91.0	4	3	75.0	21	15	71.4
4 - 7	1,052	825	78.4	5	3	60.0	41	22	53.7
8 - 15	2,809	2,292	81.6	25	11	44.0	122	71	58.2
16 - 20	54,495	48,310	88.7	108	42	38.9	473	279	59.0
21 - 24	33,472	29,498	88.1	57	18	31.6	276	152	55.1
25 - 29	32,599	28,906	88.7	61	19	31.1	283	163	57.6
30 - 34	26,180	23,303	89.0	54	14	25.9	229	140	61.1
35 - 39	25,900	23,233	89.7	38	16	42.1	193	110	57.0
40 - 44	24,957	22,375	89.7	43	14	32.6	198	133	67.2
45 - 49	24,129	21,709	90.0	57	29	50.9	197	151	76.6
50 - 54	21,025	19,149	91.1	36	17	47.2	184	142	77.2
55 - 59	17,211	15,756	91.5	32	17	53.1	124	108	87.1
60 - 64	12,559	11,500	91.6	26	16	61.5	102	78	76.5
65 - 69	8,543	7,796	91.3	24	10	41.7	82	65	79.3
70 - 74	6,291	5,726	91.0	24	16	66.7	49	41	83.7
75 and over	11,216	10,188	90.8	72	49	68.1	104	88	84.6
Unknown	258	152	58.9	1	0	0.0	5	3	60.0
Total	304,074	271,742	89.4	669	295	44.1	2,692	1,768	65.7

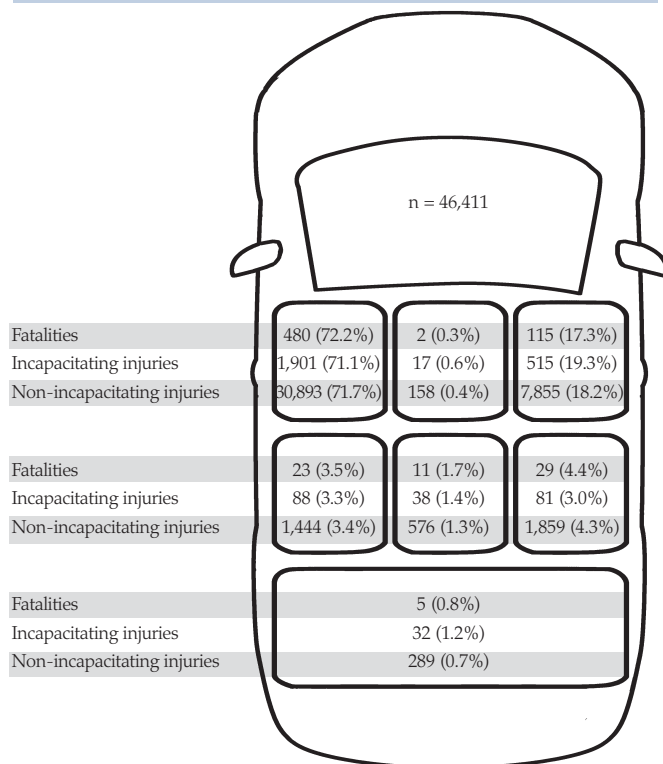
Source: Indiana State Police Automated Reporting Information Exchange System (ARIES), as of March 16, 2008

Notes:

Includes only injuries occurring in passenger vehicles (defined as passenger cars, pickup trucks, SUVs, and vans). Excludes all other vehicle types including those identified as pedestrians and pedalcyclists.

For the purposes of this fact sheet, vehicle occupants injured in Indiana collisions are counted as having been restrained when the reporting officer selected any one of the following safety equipment categories on the Indiana Crash Report: (1) Lap belt only; (2) Harness; (3) Airbag deployed and harness; (4) Child restraint; or (5) Lap and harness.

Figure 3: Number and percentage of individuals injured or killed in Indiana passenger vehicle collisions by seating position and injury status, 2007



Source: Indiana State Police Automated Reporting Information Exchange System (ARIES), as of March 16, 2008

Notes:

Percentages depicted are the percentage of total injuries by injury type in each seating position.

Injuries include only individuals obtaining fatal, incapacitating, non-incapacitating, and possible injuries where valid seating position was identified.

Non-incapacitating injuries include those injuries reported as both non-incapacitating and possible.

Includes only individuals injured in passenger vehicles (defined as passenger cars, pickup trucks, SUVs, and vans). Excludes all other vehicle types including those identified as pedestrians and pedalcyclists.

RESTRAINT USE AND VEHICLE TYPE

The relative risk of serious injury is higher across all passenger vehicle types when vehicle occupants are unrestrained. Table 2 depicts the number and percentage of passenger vehicle occupants injured or killed in Indiana traffic collisions in 2007 by vehicle type, restraint usage, and injury status. Among those individuals wearing proper restraints injured in passenger cars, only one-tenth of a percent were fatally injured, while three and one-half percent of unrestrained injured passenger car occupants were fatally injured, indicating that an individual is

29 times more likely to be killed in a passenger car when unrestrained. Although other contributing factors must be considered, data shows that unrestrained occupants of pickup trucks were 24 times more likely to be killed and 10 times more likely to suffer incapacitating injuries in traffic collisions than occupants using proper safety restraints. The relative risk of fatal injury to unrestrained occupants of an SUV was 100 times greater than SUV occupants wearing proper restraints.

INDIANA RESTRAINT USE AND AGE

Rates of restraint usage among passenger vehicle occupants injured in Indiana traffic collisions were lower across all age groups for individuals suffering more severe injuries. Table 3 shows that the lowest rates of restraint use occurred among passenger vehicle occupants killed in 2007 collisions in the 21 to 24, 25 to 29, and 30 to 34 year old age groups. For example, only 26 percent of fatally injured passenger vehicle occupants in the 30 to 34 year old age group were properly restrained. While rates of restraint use were higher for individuals suffering incapacitating injuries than those of individuals suffering fatal injuries, restraint usage in the incapacitating injury category remained proportionally lower than restraint use among all injuries across all age groups. Among passenger vehicle occupants suffering incapacitating injuries, individuals in the 4 to 7, 21 to 24, and 35 to 39 year old age groups demonstrated the lowest rates of restraint use.

TRAFFIC INJURIES AND VEHICLE SEATING POSITION

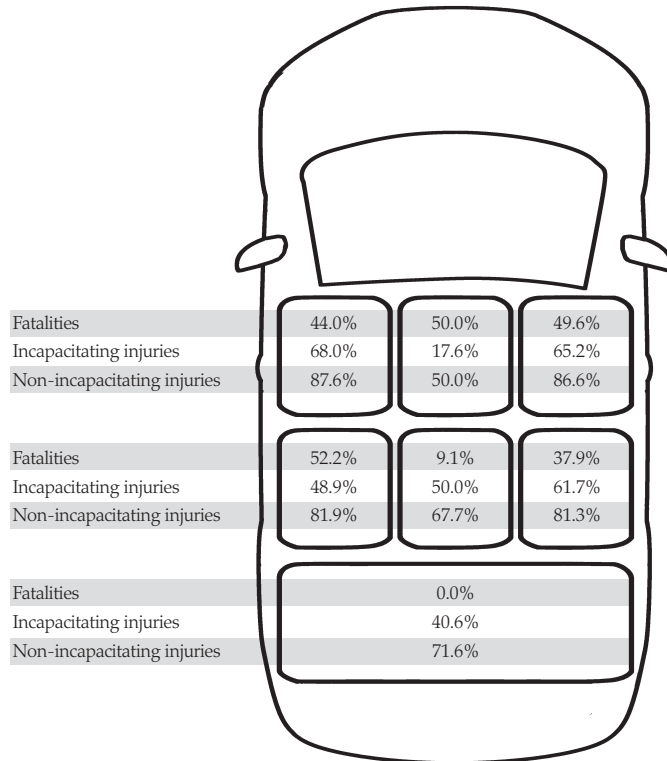
Research shows that vehicle seating position is linked to the risk of injury for all vehicle occupants. The federal Centers for Disease Control and Prevention report that children less than 16 years old, riding in the back seat, are 40 percent less likely to be seriously injured in traffic collisions.⁴ NHTSA recommends that all children under the age of 13 ride in the back seat of the vehicle. Despite this recommendation, findings from the 2007 Indiana Child Restraint Survey, conducted by the Automotive Safety Program, Riley Hospital for Children and the Indiana University School of Medicine, Division of Biostatistics, suggest that nearly 6 percent of 4 to 7 year old and one-third of 8 to 12 year old study participants were observed seated in the front right passenger seating position.⁵

Figure 3 shows the number and percentage of 2007 injuries by injury type and vehicle seating position. Greater than 72 per-

⁴Centers for Disease Control and Prevention, Department of Health and Human Services, *Child Passenger Safety: Fact Sheet*, extracted from website, November 19, 2007, <http://www.cdc.gov/ncipc/factsheets/childpas.htm>.

⁵R. Thelin and D. Sapp. (2008). *Indiana Child Restraint Survey: 2007*, Center for Urban Policy and the Environment, School of Public and Environmental Affairs, IUPUI and Automotive Safety Program, Riley Hospital for Children, May.

Figure 4: Restraint use in Indiana passenger vehicle collisions by seating position and injury status, 2007



Source: Indiana State Police Automated Reporting Information Exchange System (ARIES), as of March 16, 2008

Notes:

Restraint use rates are calculated based on individuals properly restrained across all injury categories including those reported as *fatal, incapacitating, non-incapacitating, possible, not reported, unknown, refused (treatment), and invalid and null value injury status codes.*

For the purposes of this fact sheet, vehicle occupants injured in Indiana collisions are counted as having been restrained when the reporting officer selected any one of the following safety equipment categories on the Indiana Crash Report: (1) *Lap belt only*; (2) *Harness*; (3) *Airbag deployed and harness*; (4) *Child restraint*; or (5) *Lap and harness.*

Includes only individuals injured in passenger vehicles (defined as *passenger cars, pickup trucks, SUVs, and vans*). Excludes all other vehicle types including those identified as *pedestrians and pedalcyclists.*

cent of passenger vehicle fatalities and 71 percent of incapacitating injuries were drivers, while 17 percent of passenger vehicle fatalities and 19 percent of incapacitating injuries were seated in the front right passenger position. While these numbers suggest that front seat occupants of passenger vehicles are at greater risk of injury in traffic collisions, it is important to note that front of the vehicle seating positions are the most likely to be occupied—there is always a driver, followed most often by a single passenger in the front. Further research is needed to determine the degree of correlation between injury severity and seating position. Again, the rate of restraint use also is related to the degree of injury across all seating positions. Figure 4 illustrates that 44 percent of drivers fatally injured in Indiana passenger vehicle collisions were properly restrained, while nearly 88 percent of drivers obtaining non-incapacitating injuries were wearing proper safety restraints. None of the fatally injured occupants located in the third row seating positions were properly restrained, while 71 percent of third row occupants obtaining non-incapacitating injuries were wearing proper safety restraints. Rates of restraint usage were lower across injury categories in the front middle as well as all back seat and third row seating positions.

EJECTION AND RESTRAINT USE

Research findings suggest that proper restraint usage greatly decreases the likelihood of ejection from passenger vehicles in traffic collisions. Table 4 shows serious injuries occurring in 2007 passenger vehicle collisions by restraint use and ejection status. Nearly 20 percent of all fatal injuries were reported as *ejected*, and nearly 6 percent were reported as *partially ejected*. Among those individuals who were properly restrained, only 3 percent of individuals fatally injured were ejected, while 36 percent of individuals who were unrestrained were ejected from the vehicle. Twenty-five percent of unrestrained passenger vehicle occupants obtaining incapacitating injuries were ejected from the vehicle.

Only 44 percent of the 669 passenger vehicle occupants killed in 2007 Indiana traffic collisions were properly restrained.

Table 4: Serious injuries occurring in passenger vehicles by restraint use and ejection status, 2007

	Restrained	%	Unrestrained	%	Unknown	%	Total	%
Fatalities	295	100.0	292	100.0	82	100.0	669	100.0
Ejected	9	3.1	104	35.6	18	22.0	131	19.6
Partially ejected	5	1.7	26	8.9	7	8.5	38	5.7
Pinned under	3	1.0	7	2.4	1	1.2	11	1.6
Trapped in	195	66.1	99	33.9	41	50.0	335	50.1
Not ejected or trapped	83	28.1	54	18.5	10	12.2	147	22.0
Unknown	0	0.0	2	0.7	5	6.1	7	1.0
Incapacitating injuries	1,768	100.0	662	100.0	262	100.0	2,692	100.0
Ejected	14	0.8	166	25.1	21	8.0	201	7.5
Partially ejected	10	0.6	26	3.9	4	1.5	40	1.5
Pinned under	9	0.5	15	2.3	2	0.8	26	1.0
Trapped in	430	24.3	145	21.9	58	22.1	633	23.5
Not ejected or trapped	1,296	73.3	299	45.2	147	56.1	1,742	64.7
Unknown	9	0.5	11	1.7	30	11.5	50	1.9

Source: Indiana State Police Automated Reporting Information Exchange System (ARIES), as of March 16, 2008

Notes:

Includes only individuals injured in passenger vehicles (defined as *passenger cars, pickup trucks, SUVs, and vans*). Excludes all other vehicle types including those identified as *pedestrians and pedalcyclists*.

Individuals injured counts include only individuals identified as drivers and injured occupants obtaining injuries reported as *fatal and incapacitating*. *Unknown* ejection status includes those injuries reported as *unknown* and *null* values.

For the purposes of this fact sheet, vehicle occupants injured in Indiana collisions are counted as having been restrained when the reporting officer selected any one of the following safety equipment categories on the Indiana Crash Report: (1) *Lap belt only*; (2) *Harness*; (3) *Airbag deployed and harness*; (4) *Child restraint*; or (5) *Lap and harness*.

TIME OF DAY AND RESTRAINT USE

Figure 5 depicts the frequency of serious injury collisions by time of day and day of the week. Each data point represents the number of serious injury collisions for a particular hour of the day for each day of the week.

Most serious injury collisions occurred during morning and afternoon rush hour periods with the highest number of serious injury collisions occurring on Friday afternoon (54). Late night collisions are highest on the weekend. The AM mean number of serious injury collisions per hour was 17, while the PM mean number of serious injury collisions per hour was 29.

The number of serious injury collisions occurring during late night and early morning hours was lower, due in part to the fact that fewer vehicles are on the road during these time periods. Data also suggest that rates of restraint

usage during overnight hours are dramatically lower than during other periods of the day. Figure 6 depicts rates of restraint use among injured passenger vehicle occupants by time of day and day of the week. The lowest rates of restraint use occurred between 2 and 3 a.m. (69 percent) and 4 and 5 a.m. (68 percent) on Saturday.

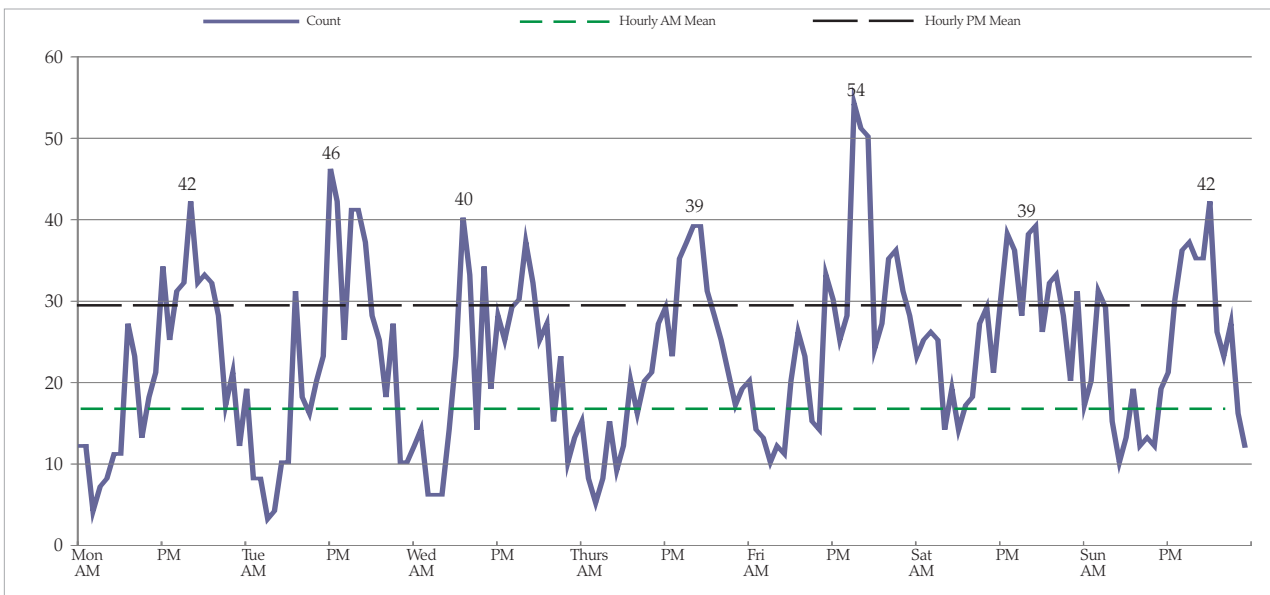
GEOGRAPHY OF INDIANA TRAFFIC INJURIES AND RESTRAINT USE

Figure 7 illustrates the linear relationship between restraint use and rates of serious injury (fatal and incapacitating) in Indiana counties. Consistent with other research findings, this scatter plot shows that, generally, as the rate of restraint use reported in collisions increases, the rate of serious injury decreases (for each percentage point increase in

restraint usage, the fatal and incapacitating injury rate per 10,000 population decreases 0.11)

Nearly 20 percent of those killed in 2007 Indiana collisions were ejected from the vehicle.

Figure 5: Serious injury collisions by time of day and day of week, 2007

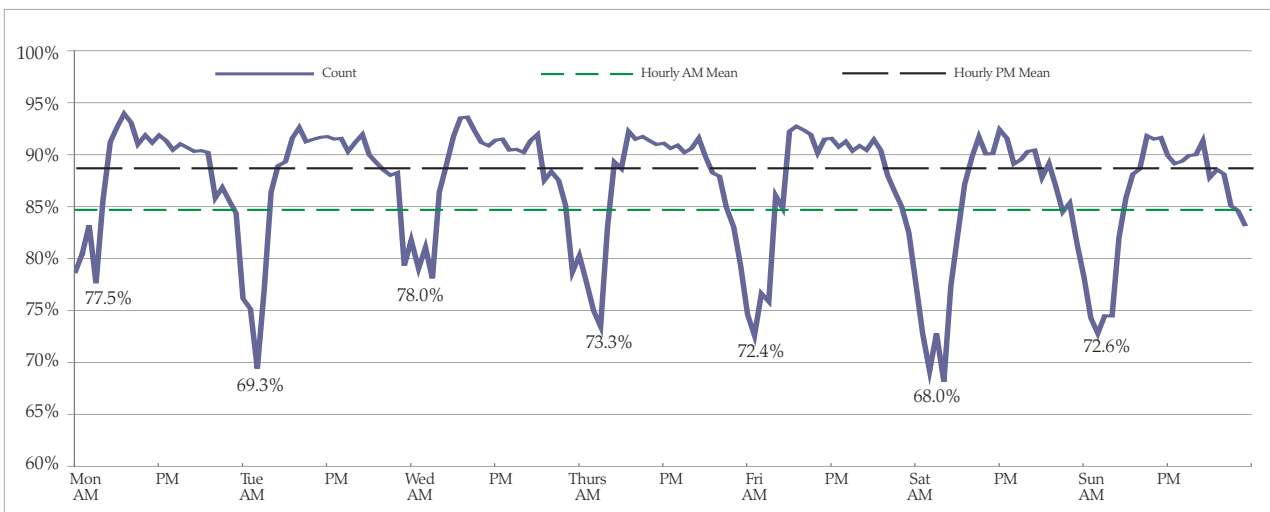


Source: Indiana State Police Automated Reporting Information Exchange System (ARIES), as of March 16, 2008

Note:

Serious injury collisions are defined as those collisions where one or more injured occupants obtained injuries reported as *fatal* or *incapacitating*.

Figure 6: Restraint use among injured occupants in passenger vehicle collisions by time of day and day of week, 2007



Source: Indiana State Police Automated Reporting Information Exchange System (ARIES), as of March 16, 2008

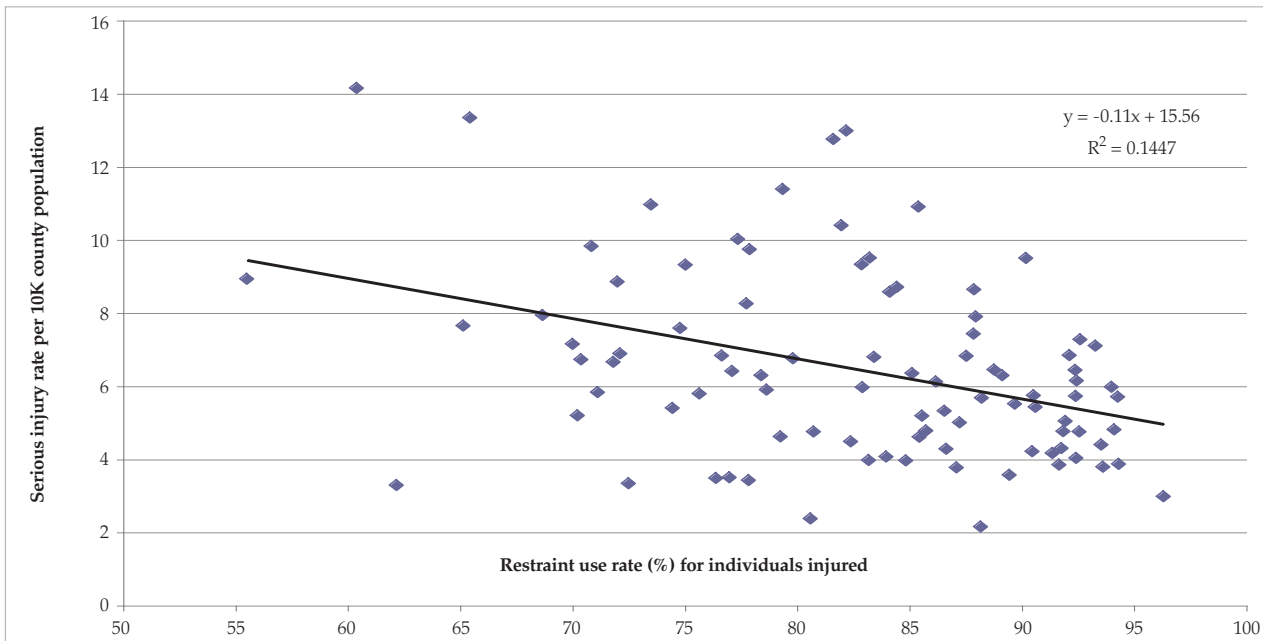
Notes:

Includes only individuals injured in passenger vehicles (defined as *passenger cars, pickup trucks, SUVs, and vans*). Excludes all other vehicle types including those identified as *pedestrians and pedalcyclists*.

Restraint use rates are calculated based on individuals properly restrained across all injury categories including those reported as *fatal, incapacitating, non-incapacitating, possible, not reported, unknown, refused (treatment), and invalid and null value* injury status codes.

For the purposes of this fact sheet, vehicle occupants injured in Indiana collisions are counted as having been restrained when the reporting officer selected any one of the following safety equipment categories on the Indiana Crash Report: (1) *Lap belt only*; (2) *Harness*; (3) *Airbag deployed and harness*; (4) *Child restraint*; or (5) *Lap and harness*.

Figure 7: Relationship between Indiana county rates of serious injury and rates of restraint use, 2007



Source: Indiana State Police Automated Reporting Information Exchange System (ARIES), as of March 16, 2008

Notes:

Includes only individuals injured in passenger vehicles (defined as *passenger cars, pickup trucks, SUVs, and vans*). Excludes all other vehicle types including those identified as *pedestrians and pedalcyclists*.

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Maps 1 and 2 further illustrate the distribution of fatal and incapacitating passenger vehicle occupant injuries and rates of restraint use by county. As suggested by the inverse relationship in Figure 7, counties demonstrating lower rates of serious injury per 10,000 county residents (Map 1) tend to have higher rates of restraint use (Map 2). The mean fatal and incapacitating injury rate per 10,000 county residents was 6.5, while the mean rate of county restraint use reported in Indiana collisions was 82.8 percent. Counties with the highest rates of serious injury were clustered in the west central and southeastern regions of the state. In turn, these areas also had the lowest rates of restraint use in collisions. Warren (14.1), Franklin (13.3), and Crawford (13.0) counties had the highest fatal and incapacitating injury rates per 10,000, while LaGrange (2.2), Pike (2.4), and Hamilton (3.0) counties had the lowest rates. Hamilton (96.3), St. Joseph (94.3), and Elkhart (94.3) counties had the highest rates of restraint use among passenger vehicle occupants, while Owen (55.5), Warren (60.4), and Fayette (62.2) counties had the lowest rates. Restraint usage in collisions appears to be higher in metropolitan (urban and suburban) counties.

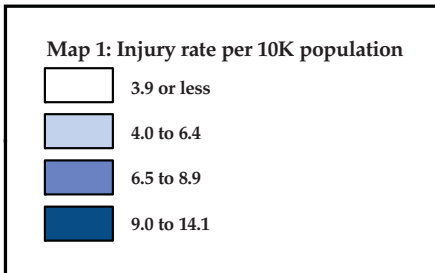
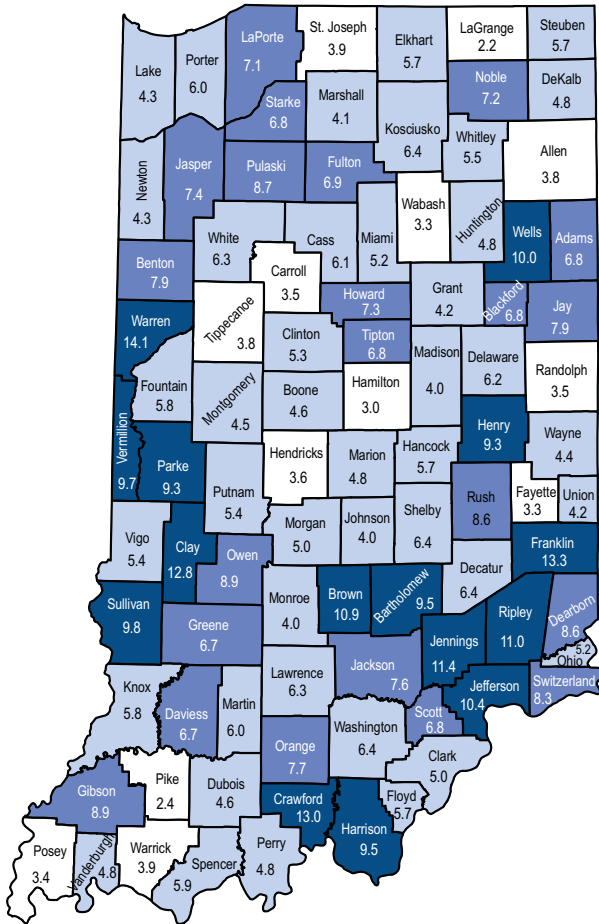
Unrestrained occupants of passenger cars were 29 times more likely to be killed in 2007 traffic collisions than occupants using proper safety restraints.

Serious injury and restraint use rates in Indiana traffic collisions by county (2007)

Map 1: County fatal and incapacitating injury rates

Mean = 6.5

n = 3,361 fatal/incapacitating injuries

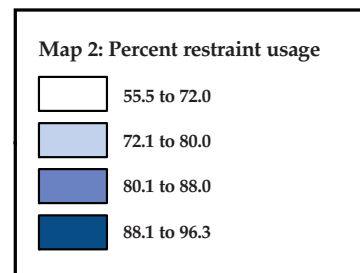
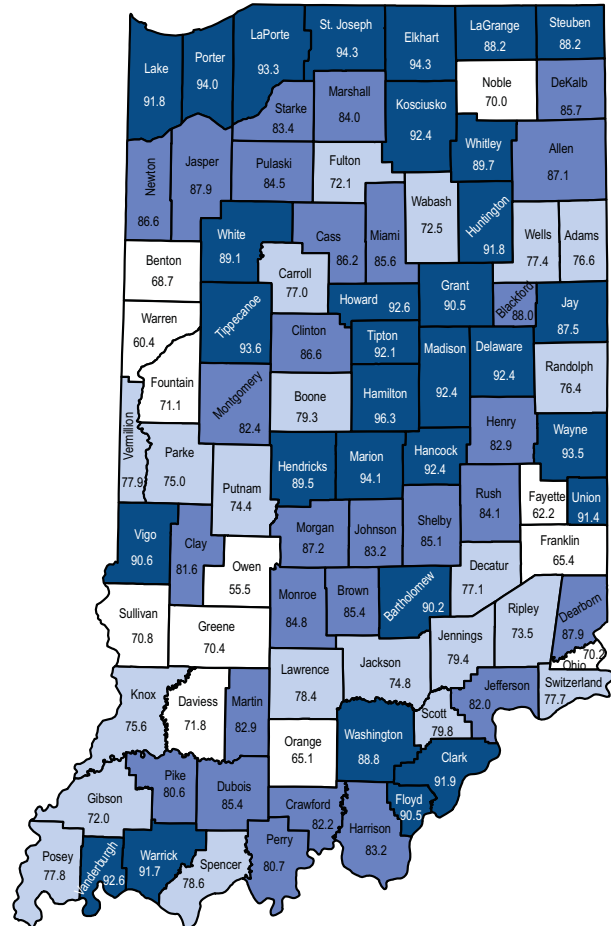


Map 2: Restraint use rates

Indiana overall restraint use rate = 89.4

Mean county restraint use rate = 82.8

n = 304,074 individuals injured



Source: Indiana State Police Automated Reporting Information Exchange System (ARIES), as of March 16, 2008

Notes:

Rates per 10,000 were calculated using 2007 annual population estimates, Population Division, U.S. Census Bureau, release March 20, 2008.

Serious injury rates include only fatal and incapacitating injuries occurring in passenger vehicles (defined as passenger cars, pickup trucks, SUVs, and vans). Excludes all other vehicle types including those identified as pedestrians and pedalcyclists.

Restraint use rates are calculated based on individuals properly restrained across all injury categories including those reported as fatal, incapacitating, non-incapacitating, possible, not reported, unknown, refused (treatment), and invalid and null value injury status codes.

Due to a lack of available address-level data on traffic collision victims, it is assumed that individuals injured in collisions live in the county in which they were injured.

OCCUPANT PROTECTION LAWS AND BEST PRACTICES

NHTSA identifies safety belt use as the most effective strategy a person can employ to prevent deaths and injuries resulting from traffic collisions.⁶ NHTSA reports that states with primary enforcement laws achieve higher restraint usage than states with secondary enforcement laws.⁷ Primary (standard) restraint laws allow a law enforcement officer to stop a vehicle and issue a citation when the officer observes an unrestrained driver or passenger. Secondary enforcement means that a citation for being unrestrained can only be written after the officer stops the vehicle or cites the offender for another infraction.⁸ A recent NHTSA report suggests that states with primary enforcement laws have significantly lower fatality rates than states without primary enforcement.⁹

As of January 2007, 25 states and the District of Columbia are primary enforcement states. Twenty-four states have secondary enforcement and one state, New Hampshire, has no safety belt law. In the Great Lakes Region (including the states of Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin), only Illinois, Indiana, and Michigan have primary enforcement laws.

INDIANA OCCUPANT PROTECTION LAWS AND BEST PRACTICES

Effective July 1, 2007, Indiana law required all passenger vehicle occupants 16 and older to ride properly restrained in a seat belt. This law applies to all seating positions in all vehicles, including pick-up trucks and SUVs that were previously exempt.¹⁰

The current Indiana child passenger restraint law requires all child occupants (ages 15 and younger) to be properly restrained in a child restraint device or seat belt in all seating positions in all vehicles.¹¹ In addition to legislative efforts, child passenger safety experts have developed recommended safety standards and best practices that include the use of rear facing child safety seats as long as possible, and, at a minimum, until a child is one year old and weighs at least 20 pounds. These guidelines also include the use of booster safety seats for children who have outgrown child safety seats with harnesses. Children then may

transition to the use of adult seat belts. It is recommended that all children under the age of 13 ride in the back seat of the vehicle.

HELMETS AND OCCUPANT PROTECTION

Research findings also suggest that the use of a helmet greatly reduces the risk of serious injury to both bicyclists and motorcyclists. According to Safe Kids Worldwide, about 90 percent of all bicycle-related deaths result from collisions with motor vehicles, asserting that the "single most effective safety device available to reduce head injury and death from bicycle crashes is a helmet."¹² In Indiana, bicyclist helmet usage was very low across all injury categories in 2007. Among the 13 bicyclists killed in 2007, none were wearing helmets. Likewise, among the 84 bicyclists obtaining incapacitating injuries, only one was reported as wearing a helmet. Indiana law does not require bicyclists of any age to wear a helmet. Motorcycle helmet use has also been found to be closely related to injury severity in motorcycle crashes. In 2007, nearly three-fourths of riders killed in Indiana crashes did not wear a helmet.¹³ Indiana requires only riders under age 18 to wear helmets.

CONCLUSION

NHTSA suggests that proper restraint usage is the most effective strategy in preventing deaths or injuries resulting from traffic collisions, and research shows that primary enforcement laws increase rates of restraint use and decrease traffic fatality rates. Preliminary findings suggest that recent changes to the Indiana restraint law have contributed to increased rates of restraint use in pickup trucks. However, lower rates of restraint use among passenger vehicle occupants killed or suffering serious injury illustrate a continuing need for targeted law enforcement and public awareness campaigns, particularly in rural counties in the west central and southeastern portions of the state. Campaigns such as *Click it or Ticket* and higher law enforcement visibility may help reduce the number of traffic fatalities and injuries in problem areas across Indiana.

⁶National Highway Traffic Safety Administration, *Initiatives to Address Safety Belt Use*, Washington, DC. July 2003.

⁷National Center for Statistics and Analysis, National Highway Traffic Safety Administration, *Traffic Safety Facts: Occupant Protection (2006 data)*, Washington, DC. DT HS 810 807.

⁸Automotive Safety Program, Riley Hospital for Children, <http://www.preventinjury.org>, November 8, 2007.

⁹National Center for Statistics and Analysis, National Highway Traffic Safety Administration, *Traffic Safety Facts: States with Primary Enforcement Laws have Lower Fatality Rates (February 2008)*, Washington, DC. DT HS 810 921.

¹⁰*Passenger Restraint Systems*, IC 9-19-10-2; available at <http://www.ai.org/legislative/ic/code/title9/ar19/ch10.html>

¹¹*Passenger Restraint Systems*, IC 9-19-10-2; available at <http://www.ai.org/legislative/ic/code/title9/ar19/ch10.html>.

¹²Safe Kids Worldwide (March 2007), www.safekids.org, *Facts About Injuries to Children Riding Bicycles*.

¹³Nunn, S. (2008). *Indiana Traffic Safety Facts: Motorcycle 2007*, Center for Criminal Justice Research, School of Public and Environmental Affairs, IUPUI, May.

This publication was prepared on behalf of the Indiana Criminal Justice Institute by the Indiana University Center for Criminal Justice Research (CCJR). Please direct any questions concerning data in this document to ICJI at 317-232-1233.

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An electronic copy of this document can be accessed via the CCJR website (www.criminaljustice.iupui.edu), the ICJI traffic safety website (www.in.gov/cji/traffic/), or you may contact the Center for Criminal Justice Research at 317-261-3000.

The Indiana Criminal Justice Institute (ICJI)

Guided by a Board of Trustees representing all components of Indiana's criminal and juvenile justice systems, the Indiana Criminal Justice Institute serves as the state's planning agency for criminal justice, juvenile justice, traffic safety, and victim services. ICJI develops long-range strategies for the effective administration of Indiana's criminal and juvenile justice systems and administers federal and state funds to carry out these strategies.

The Governor's Council on Impaired & Dangerous Driving

The Governor's Council on Impaired & Dangerous Driving, a division of the Indiana Criminal Justice Institute, serves as the public opinion catalyst and the implementing body for statewide action to reduce death and injury on Indiana roadways. The Council provides grant funding, training, coordination and ongoing support to state and local traffic safety advocates.

Indiana University Public Policy Institute

The Indiana University (IU) Public Policy Institute is a collaborative, multidisciplinary research institute within the Indiana University School of Public and Environmental Affairs (SPEA), Indianapolis. The Institute serves as an umbrella organization for research centers affiliated with SPEA, including the Center for Urban Policy and the Environment, the Center for Health Policy, and the Center for Criminal Justice Research. The Institute also supports the Office of International Community Development and the Indiana Advisory Commission on Intergovernmental Relations (IACIR).

The Center for Criminal Justice Research (CCJR)

The Center for Criminal Justice Research, one of three applied research centers currently affiliated with the Indiana University Public Policy Institute, works with public safety agencies and social services organizations to provide impartial applied research on criminal justice and public safety issues. CCJR provides analysis, evaluation, and assistance to criminal justice agencies; and community information and education on public safety questions. CCJR research topics include traffic safety, crime prevention, criminal justice systems, drugs and alcohol, policing, violence and victimization, and youth.

The National Highway Traffic Safety Administration (NHTSA)

NHTSA provides leadership to the motor vehicle and highway safety community through the development of innovative approaches to reducing motor vehicle crashes and injuries. The mission of NHTSA is to save lives, prevent injuries and reduce economic costs due to road traffic crashes, through education, research, safety standards and enforcement activity.

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