

INDIANA TRAFFIC SAFETY FACTS

OCCUPANT PROTECTION 2017



INDIANA UNIVERSITY
PUBLIC POLICY INSTITUTE

IN 2017:

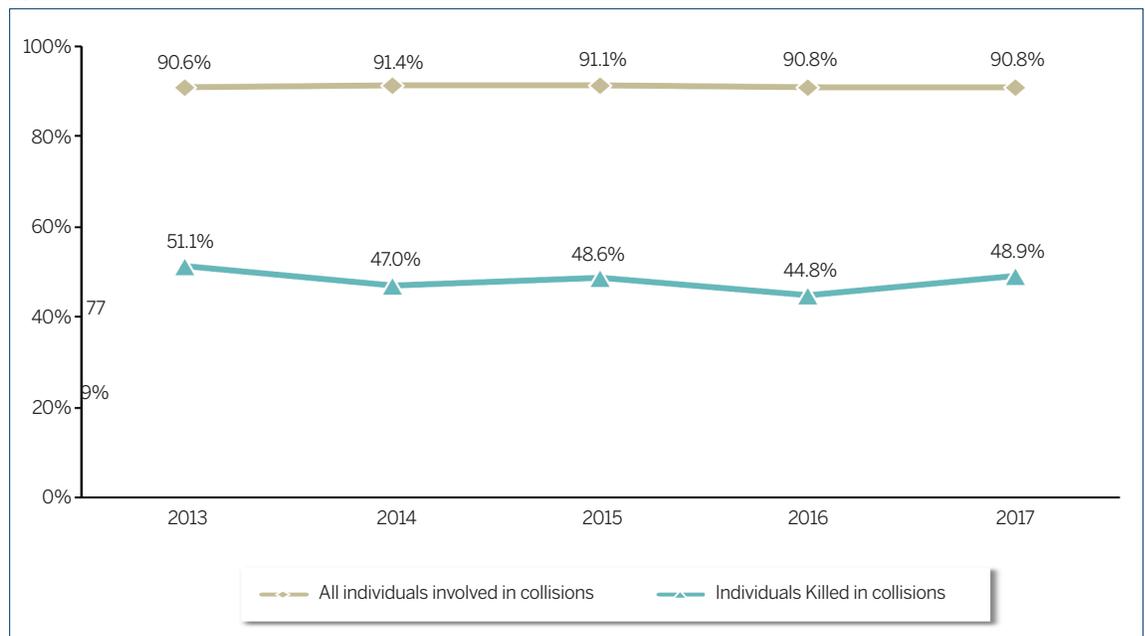
- 332,002 passenger vehicle occupants were reported to be involved in Indiana traffic collisions; 91 percent were wearing seatbelts.
- 310 of the 607 (51 percent) Indiana passenger vehicle occupants who were killed in crashes were not wearing seatbelts.
- Pickup truck occupants in Indiana crashes who were not wearing seatbelts were 12 times more likely to be killed than occupants who were properly restrained, and unrestrained SUV occupants were 18 times more likely to be killed.
- Male drivers, particularly those between the ages of 21 and 34, represented the highest proportion of passenger vehicle drivers in crashes who were not wearing a seatbelt.
- Rates of fatal and incapacitating injuries in crashes were highest between midnight and 4am, a time when the percentage of individuals in crashes who were not wearing a seatbelt was also at its highest.

In 2017, 45,660 passenger vehicle occupants were injured or killed in Indiana traffic collisions; 89 percent were wearing seatbelts or proper safety restraints (calculated from Table 1). Rates of seatbelt usage among individuals killed in crashes are consistently far lower than overall seatbelt usage rates. Among the 607 passenger vehicle occupants killed in 2017 collisions, 49 percent were properly restrained (Figure 1). This fact sheet summarizes occupant protection data trends at state and county levels in Indiana crashes. Restraint use and injury analyses are limited to those occurring in passenger vehicles (defined as *passenger cars, pickup trucks, sport utility vehicles, and vans*). Analyses include data from several sources (see last page for a full list of references, data sources, and definitions). Indiana data come primarily from the Indiana State Police Automated Reporting Information Exchange System (ARIES), as of April 6, 2018.

Note: Vehicle occupants injured in Indiana collisions are counted as having been restrained when the investigating officer selects any one of the following passenger vehicle 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. For the purposes of this fact sheet, the term seatbelt will include all five categories. A summary of Indiana Occupant Protection Laws is included on page 3.

Data discrepancies may exist between the 2017 Indiana traffic safety reports and previous traffic safety publications due to updates to the Indiana State Police ARIES data that have occurred since the original publication dates.

Figure 1. Seatbelt use among passenger vehicle occupants involved in Indiana collisions, by injury status, 2013-2017



Source: Indiana State Police Automated Reporting Information Exchange System, as of April 6, 2018

Note: Seatbelt use rates include individuals with 'NULL' and unknown restraint use in the totals.

In partnership with:

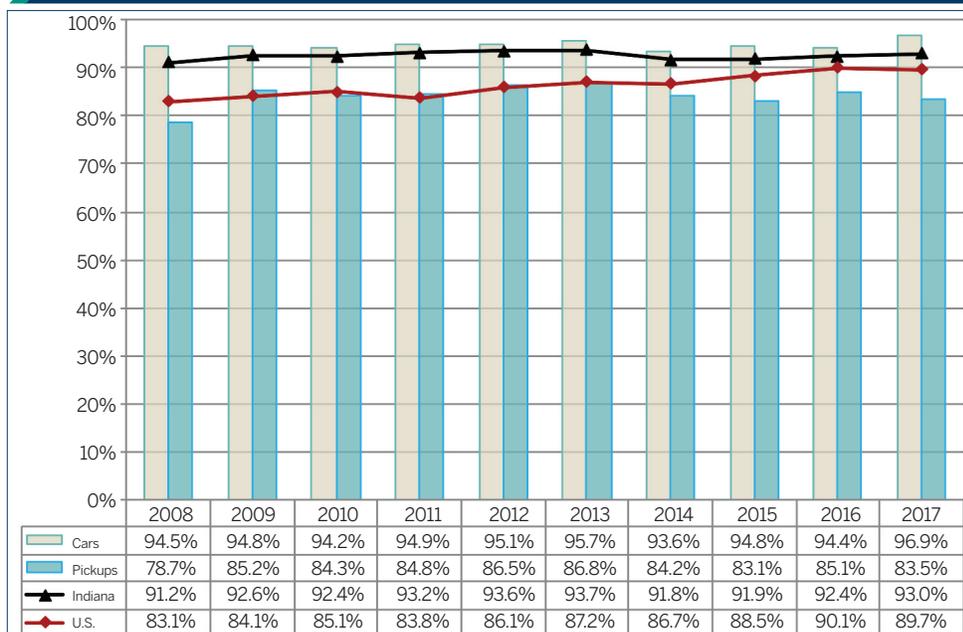


The National Highway Traffic Safety Administration (NHTSA) reports that, nationally in 2017, the overall observed seatbelt use rate was 89.7 percent, a slight decrease from 2016 (DOT HS 812 465) (Figure 2). Indiana observational studies of seatbelt usage, conducted annually by the Indiana Criminal Justice Institute (ICJI) and the Purdue University Center for Road Safety, show that Indiana's overall seatbelt usage rates have exceeded national rates since 2008. The overall Indiana observed seatbelt use rate in passenger vehicles in 2017 was 93 percent, up slightly from 2016. Figure 2 shows that Indiana restraint usage rates for all passenger vehicle occupants increased nearly 2 percentage points since 2008. Observed seatbelt use among Indiana pickup truck occupants in 2017 (83.5 percent, a slight decrease from 2016) was up 5 percentage points since 2008.

NHTSA identifies seat belt use as an essential tool to protecting vehicle occupants from death and injury resulting from traffic collisions. Research shows that rates of restraint use are consistently higher in states with primary enforcement laws which allow a law enforcement officer to stop a vehicle and issue a citation after observing an unrestrained driver or passenger. As of May 2017, Indiana was one of 35 states that have primary enforcement laws in effect.

Table 1 shows the overall rate of restraint usage among passenger vehicle occupants involved in Indiana crashes was 90.8 percent in 2017. Rates of restraint usage among passenger vehicle occupants injured in Indiana traffic collisions decreased as the severity of injuries increased. The number of passenger vehicle occupants killed in Indiana crashes increased more than 3 percent from 587 in 2016 to 607 in 2017. Approximately 49 percent of these individuals were properly restrained, and 85 percent of the 17,250 individuals suffering incapacitating injuries were wearing seatbelts.

Figure 2. Observed Indiana and U.S. seat belt use rates in passenger vehicles, 2008 to 2017



Source: Indiana - *Indiana Roadside Observational Survey of Safety Belt and Motorcycle Helmet Use*, Center for Road Safety, Purdue University, 2017
U.S. - DOT HS 812 465, April 2017

Note: Car and pickup truck restraint usage rates are specific to Indiana only.

Table 1. Seatbelt use and injury status among passenger vehicle occupants involved in Indiana collisions, 2013-2017

Injury status						Annual rate of change	
	2013	2014	2015	2016	2017	2016-17	2013-17
All occupants	287,781	304,632	325,838	338,177	332,002	-1.8%	3.6%
Properly restrained	260,821	278,357	296,884	307,211	301,421	-1.9%	3.7%
Restraint use rate	90.6%	91.4%	91.1%	90.8%	90.8%	-0.1%	0.0%
Fatalities	550	500	568	587	607	3.4%	2.5%
Properly restrained	281	235	276	263	297	12.9%	1.4%
Restraint use rate	51.1%	47.0%	48.6%	44.8%	48.9%	9.2%	-1.1%
Incapacitating injuries	2,470	4,342	15,900	17,888	17,250	-3.6%	62.6%
Properly restrained	1,824	3,458	13,410	15,165	14,686	-3.2%	68.4%
Restraint use rate	73.8%	79.6%	84.3%	84.8%	85.1%	0.4%	3.6%
Non-incapacitating injuries	38,612	37,679	29,258	28,433	27,803	-2.2%	-7.9%
Properly restrained	34,394	33,960	26,652	25,891	25,450	-1.7%	-7.3%
Restraint use rate	89.1%	90.1%	91.1%	91.1%	91.5%	0.5%	0.7%
Not injured	246,149	262,111	280,112	291,269	286,342	-1.7%	3.9%
Properly restrained	224,322	240,704	256,546	265,892	260,988	-1.8%	3.9%
Restraint use rate	91.1%	91.8%	91.6%	91.3%	91.1%	-0.2%	0.0%

Source: Indiana State Police Automated Reporting Information Exchange System, as of April 6, 2018

Notes:

- 1) Totals include individuals with 'NULL' and unknown restraint use.
- 2) Non-incapacitating injuries include those injuries reported as *non-incapacitating, possible, not reported, unknown, and refused (treatment)* injury status codes.

RESTRAINT USE BY VEHICLE TYPE

Table 2 shows the relative risk of fatal injury when passenger vehicle occupants in crashes were not wearing seatbelts. In 2017, one-tenth of a percent or less of restrained individuals in each of the four passenger vehicle types involved in collisions were killed. Among unrestrained individuals injured in passenger cars, 1 percent were killed. This made an individual 9 times more likely to be killed in 2017 crashes in a passenger car when unrestrained compared to when they were wearing a seatbelt. Unrestrained occupants of pickup trucks were 12 times more likely to be killed than occupants wearing seatbelts, and unrestrained occupants of SUVs were 18 times more likely to be killed in collisions compared to restrained occupants in the same vehicle type. These relative risk ratios were all statistically significant ($p < 0.01$).

Table 2. Passenger vehicle occupants involved in Indiana collisions, by vehicle type, seatbelt use, and injury status, 2017

Seatbelt use and injury status	Passenger cars		Pickup trucks		SUVs		Vans	
	Count	% Total	Count	% Total	Count	% Total	Count	% Total
Restrained (R)	210,432	100.00%	33,128	100.00%	43,893	100.00%	13,968	100.00%
Fatal	225	0.1%	27	0.1%	32	0.1%	13	0.1%
Incapacitating	10,711	5.1%	1,172	3.6%	2,109	4.8%	694	5.0%
Non-incapacitating	18,065	8.6%	2,248	6.8%	3,914	8.9%	1,223	8.8%
No injury	181,431	86.2%	29,681	89.6%	37,838	86.2%	12,038	86.2%
Not restrained (NR)	21,143	100.00%	4,183	100.00%	3,928	100.00%	1,327	100.00%
Fatal	207	1.0%	42	1.0%	52	1.3%	9	0.7%
Incapacitating	1,740	8.2%	369	8.8%	325	8.3%	130	9.8%
Non-incapacitating	1,608	7.6%	271	6.5%	333	8.5%	141	10.6%
No injury	17,588	83.2%	3,501	83.7%	3,218	81.9%	1,047	78.9%
Relative risk of fatal injury	9.2		12.3		18.2		7.3	

Source: Indiana State Police Automated Reporting Information Exchange System, as of April 6, 2018

Notes:

- 1) Relative risk of fatal injury is calculated as % NR / % R. All relative risk ratios are significant ($p < 0.01$). Excludes NULL values.
- 2) Non-incapacitating injuries include those injuries reported as *non-incapacitating*, *possible*, *not reported*, *unknown*, and *refused (treatment)* injury status codes.

Indiana Occupant Protection Laws

Effective July 1, 2007, Indiana law requires all passenger vehicle occupants 16 and older to ride properly restrained in a vehicle. This law applies to all seating positions in all vehicles, including pick-up trucks and SUVs.¹ 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.² 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, or, at a minimum, until a child is two years 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.

¹Passenger Restraint Systems, IC 9-19-10-2; available at <http://iga.in.gov/legislative/laws/2018/ic/titles/009/#9-19-10>

²Passenger Restraint Systems, IC 9-19-10-2; available at <http://iga.in.gov/legislative/laws/2018/ic/titles/009/#9-19-10>

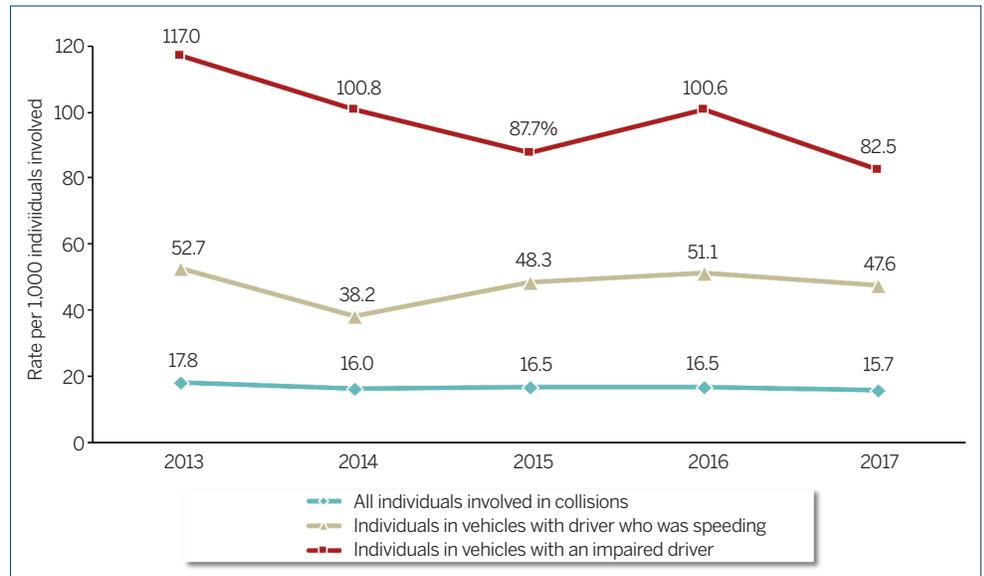
SPEEDING, IMPAIRED DRIVING, AND RESTRAINT USE

Rates of unrestrained injuries in Indiana collisions were consistently higher between 2013 and 2017 in vehicles with a driver who was speeding and in vehicles with an alcohol-impaired driver (Figure 3). In 2017, the rate of injury per 1,000 individuals involved in crashes was 15.7, compared to 47.6 per 1,000 in vehicles with a driver who was speeding, and 82.5 per 1,000 in vehicles where the driver was legally impaired.

SEATBELT USE BY AGE

When looking at restraint use by age and gender between 2013 and 2017, male drivers in collisions were consistently more likely to be unrestrained than females in the same age groups (Table 3). Male drivers in the 21 to 24 and 25 to 34 age groups represented the highest proportion of passenger vehicle drivers who were not wearing seatbelts in collisions from 2013 through 2017. Among female drivers in 2017 crashes, those in the 21 to 24, 25 to 34, and 65 to 74 age groups represented the highest proportion of unrestrained drivers.

Figure 3. Unrestrained injury rates per 1,000 passenger vehicle occupants in Indiana collisions, by drivers speeding and driver impairment, 2013-2017



Source: Indiana State Police Automated Reporting Information Exchange System, as of April 6, 2018

Note: Injuries include injury status codes reported as fatal, incapacitating, non-incapacitating, possible, refused (treatment), and unknown.

Table 3. Proportion of passenger vehicle drivers in Indiana collisions who were unrestrained, by age group and gender, 2013-2017

Age group	2013		2014		2015		2016		2017	
	Male	Female								
15-20	9.8%	7.6%	9.2%	7.4%	9.5%	7.4%	9.4%	8.3%	9.6%	8.0%
21-24	11.2%	7.7%	10.0%	7.2%	10.4%	7.5%	10.5%	7.8%	10.2%	8.2%
25-34	10.8%	8.0%	10.1%	7.4%	10.3%	7.8%	10.6%	7.9%	10.5%	8.2%
35-44	9.8%	7.8%	9.0%	7.1%	9.1%	7.3%	9.7%	7.9%	9.8%	7.8%
45-54	9.5%	7.5%	8.5%	6.9%	8.6%	7.4%	8.9%	7.9%	8.9%	7.8%
55-64	8.6%	7.6%	8.1%	7.1%	8.6%	6.9%	8.7%	7.7%	9.1%	7.6%
65-74	9.0%	7.5%	7.8%	6.8%	8.8%	7.0%	8.1%	7.2%	8.8%	8.2%
75 +	9.2%	8.1%	8.1%	7.6%	8.6%	7.8%	9.0%	8.2%	9.6%	8.0%
All ages	9.9%	7.7%	9.1%	7.2%	9.4%	7.4%	9.6%	7.9%	9.7%	7.9%



Source: Indiana State Police Automated Reporting Information Exchange System, as of April 6, 2018

Notes:

- 1) Data limited to drivers of passenger vehicles with valid gender and age reported.
- 2) Percent unrestrained includes individuals reported with "No restraint" and NULL values in the restraint use code field.

TIME OF DAY, DAY OF WEEK, AND RESTRAINT USE

In 2017, the highest percentage of hourly fatal and incapacitating injuries occurred during overnight hours (between 12am and 4am) (Figure 4). The highest hourly rates of unrestrained individuals in crashes occurred during this same time period. The highest percentage of hourly fatal and incapacitating injuries in 2017 occurred between 3am and 4am (10.5 percent). The highest hourly rate of unrestrained individuals in crashes occurred between 3am and 4am (18 percent).

On average, daily counts of unrestrained passenger vehicle occupants in daytime collisions are higher than counts in nighttime collisions. In 2017, the average daily count of unrestrained passenger vehicle occupants in daytime collisions was 403, compared to 295 in nighttime collisions (Figure 5). Nighttime counts of unrestrained passenger vehicle occupants exceeded daily averages on Saturday, and Sunday.

GEOGRAPHY OF INDIANA RESTRAINT USE

Map 1 illustrates the percentage of unrestrained passenger vehicle occupants in collisions for each Indiana county in 2017. The median county percentage of unrestrained passenger vehicle occupants who were injured in collisions was 16 percent, and the mean county percent was 17 percent. Many counties with higher rates (at or above the median) of unrestrained passenger vehicle occupants injured in crashes were located outside of central Indiana, particularly in the western and southern portions of the state. Relatively low rates of unrestrained injured occupants (below the median) in 2017 crashes were clustered in areas of central and northern Indiana. Warren (47.1 percent) and Vermillion (35.8 percent) counties had the highest percent of injured passenger vehicle occupants in crashes who were not wearing seatbelts, while Whitley (3.9 percent) and Hamilton (4.0 percent) counties had the lowest percent of injured occupants who were unrestrained.

Figure 4. Indiana fatal and incapacitating injuries and seatbelt use in passenger vehicles, by time of day, 2017

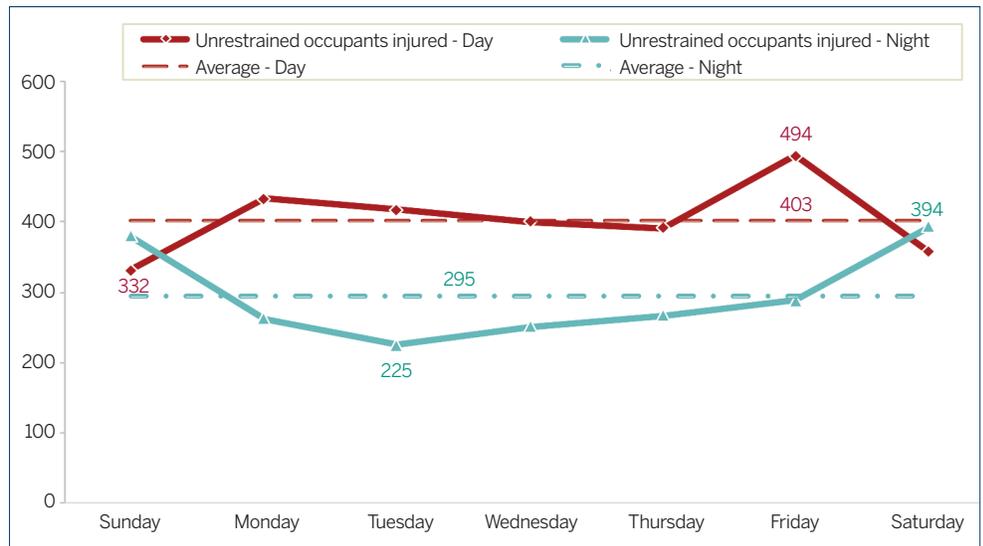


Source: Indiana State Police Automated Reporting Information Exchange System, as of April 6, 2018

Notes:

- 1) Percent fatal and incapacitating injuries represents fatal or incapacitating injuries as a proportion of all individuals involved in collisions.
- 2) Percent **not** wearing a seatbelt includes individuals reported with unknown and invalid safety equipment type.

Figure 5. Unrestrained passenger vehicle occupants injured in Indiana collisions, by day of week and day/night, 2017



Source: Indiana State Police Automated Reporting Information Exchange System, as of April 6, 2018

Notes:

- 1) Day is defined as 6am - 5:59pm. Night is defined as 6pm - 5:59am.
- 2) Includes passenger vehicle occupants with fatal, incapacitating, non-incapacitating, and possible injuries.

DEFINITIONS

Annual rate of change (ARC) – The rate that a beginning value must increase/decrease each period (e.g. month, quarter, year) in a time series to arrive at the ending value in the time series. ARC is a “smoothed” rate of change because it measures change in a variable as if the change occurred at a steady rate each period with compounding. For example, to measure change in a variable from 2013 to 2017, it is calculated as $(\text{Value in 2017}/\text{Value in 2013})^{1/4} - 1$.

Not injured status includes individuals involved in collisions reported as *null* values in the injury status code field. While reporting officers are instructed to enter all drivers in ARIES, passengers are only to be entered in the crash report if an injury occurs; therefore, not injured counts should be interpreted with caution.

Non-incapacitating injuries include those injuries reported as *non-incapacitating*, *possible*, *not reported*, *unknown*, and *refused* (treatment) injury status codes.

Passenger vehicles are defined as *passenger cars*, *pickup trucks*, *sport utility vehicles*, and *vans*.

Restraint use - Vehicle occupants injured in Indiana collisions are counted as having been restrained when the investigating officer selects any one of the following passenger vehicle 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*.

REFERENCES

Indiana Roadside Observational Survey of Safety Belt and Motorcycle Helmet Use, Center for Road Safety, Purdue University, 2017

National Center for Statistics and Analysis, National Highway Traffic Safety Administration, *Seat Belt Use in 2017–Overall Results*, DOT HS 812 465, April 2018.

DATA SOURCES

Indiana State Police Automated Reporting Information Exchange System (ARIES), as of April 6, 2018.

National Center for Statistics and Analysis, National Highway Traffic Safety Administration, *Seat Belt Use in 2017–Overall Results*, DOT HS 812 465, April 2018.

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

This publication is one of a series of publications that form the analytical foundation of traffic safety program planning and design in the state of Indiana. Funding for these publications is provided by ICJI and the National Highway Traffic Safety Administration.

An electronic copy of this document can be accessed via the PPI website (<http://trafficsafety.iupui.edu>), the ICJI website (www.in.gov/cji/), or you may contact the PPI at 317-261-3000.

Traffic Safety Project

Designing and implementing effective traffic safety policies requires data-driven analysis of traffic collisions. To help in the policy-making process, the Indiana University Public Policy Institute collaborates each year with the Indiana Criminal Justice Institute to analyze vehicle crash data from the Automated Reporting Information Exchange System (ARIES), maintained by the Indiana State Police. This marks the twelfth year of this partnership. Research findings are summarized in a series of publications on various aspects of traffic collisions, including alcohol-related crashes, commercial vehicles, dangerous driving, child passenger safety, motorcycles, occupant protection, and drivers. An additional publication provides detailed information for each county and municipality. 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 law enforcement officers. Crash reports for all Indiana collisions are entered electronically through ARIES. Collision trends as reported in these publications 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. 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. If you have questions regarding trends or unexpected results, please contact the Indiana Criminal Justice Institute, Traffic Safety Division for more information.

The Indiana Criminal Justice Institute

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.

Indiana University Public Policy Institute

The IU Public Policy Institute delivers unbiased research and data-driven, objective, expert analysis to help public, private and nonprofit sectors make important decisions that directly impact quality of life in Indiana. Using the knowledge and expertise of our staff and faculty, we provide research and analysis that is free of political and ideological bias. A multidisciplinary institute within the Indiana University School of Public and Environmental Affairs (SPEA), our efforts also support the Indiana Advisory Commission on Intergovernmental Relations (IACIR).

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.



INDIANA UNIVERSITY
PUBLIC POLICY INSTITUTE

 SCHOOL OF
**PUBLIC AND
ENVIRONMENTAL AFFAIRS**
Indiana University

Author: Dona Sapp, Senior Policy Analyst