

# INDIANA 2010 TRAFFIC SAFETY FACTS

## EFFECTS OF GRADUATED DRIVER LICENSING ON CRASH OUTCOMES IN INDIANA

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The risks associated with teen drivers because of inexperience and immaturity is well documented (Compton & Ellison-Potter, 2008). Teenagers are at a greater risk for crashes during the nighttime, with passengers present, and because of a general willingness to take greater risks than older drivers. Graduated Driver Licensing (GDL) standards are designed to limit exposure to high-risk situations and to provide young drivers with the experience necessary to assess risks and respond appropriately. Research on the impacts of GDL implementation is extensive and nearly unanimous in its findings. Crash rates for teenagers have been shown to drop sharply after GDL implementation, typically on the order of 10 to 20 percent below pre-GDL rates (Foss & Evenson, 1999; Foss, Feaganes, & Rodgman, 2001; Chen, Baker, & Guohua, 2006). Restrictions on nighttime driving and passengers have been shown to be particularly effective in reducing crash rates (McKnight & Peck, 2002). GDL standards vary by state, but, in general, research has shown that more restrictive GDL requirements result in greater reductions in crash outcomes.

On July 1, 2010, Indiana implemented the second phase in its Graduated Driver Licensing (GDL) system. As of January 2011, there now exist six

months of data on the first cohort of teenagers (ages 15 to 17) to enter the GDL system in Indiana. This issue brief uses police-reported crash data to analyze preliminary results on crash reduction for this group as a result of GDL implementation. The first section summarizes Indiana GDL standards and how they compare to other states. The second section discusses particular outcomes associated with the Indiana GDL system and a timeline for when to expect results. The third section analyzes police-reported crash data in Indiana for impacts on crash rates among teen drivers. The final section summarizes findings.

### UNDERSTANDING INDIANA'S GDL SYSTEM

Indiana's GDL addresses teen driving risks by increasing the minimum age at which teens can get a permit and probationary license, extending the minimum holding period for progressing through learner and probationary stages, and placing greater restrictions on nighttime driving and in vehicles with passengers (Table 1). Effective July 1, 2009, drivers issued a probationary license on or after that date are prohibited from using any

**Table 1: Indiana graduated driver licensing system**

	Existing law	GDL law	Net GDL impact
<b>Applies to probationary license issued:</b>			
	Before 7/1/2009	After 6/30/2009	After 6/30/2010
<b>Stage 1: Learner Permit</b>			
Minimum age			
<i>With Driver Ed</i>	15 years		15 years, 180 days + 180 days
<i>Without Driver Ed</i>	16 years		--
Minimum holding period	60 days	180 days	+ 120 days
<b>Stage 2: Probationary license</b>			
Minimum age			
<i>With Driver Ed</i>	16 years, 30 days	16 years, 180 days	+ 150 days
<i>Without Driver Ed</i>	16 years, 180 days	16 years, 270 days	+ 90 days
Minimum holding period	60 days	180 days	+ 120 days
Supervised driving	None required	50 hours (10 nighttime)	+ 50 hours
Cell phone use while driving	No restrictions	Prohibited	Total prohibition
Nighttime driving restrictions	Su-Th 11pm-5am Sa-Su 1am-5am	First 180 days: 10pm-5am After first 180 days: Su-Th 11pm-5am, Sa-Su 1am-5am	More restrictive for first six months
Passengers (see note below for exceptions)	First 90 days: No passengers unless a licensed adult	First 180 days: Prohibited unless licensed adult After first 180 days: None	+ 90 days
<b>Stage 3: Unrestricted license</b>			
Minimum age	18 years		--

Sources: IC 9-24-3, IC 9-24-11, IC 31-37-3

Note: Exceptions for passenger restrictions include transporting children, siblings, spouses and for work, school, or religious functions.



telecommunications device while driving, cannot drive between 10pm and 5am for the first 180 days of holding the license, and can only have licensed adults age 25 and over as passengers in the car (also for the first 180 days). Exceptions are granted on the nighttime and passenger restrictions if the driving is for the purposes of work, school, or religion.

The more comprehensive second phase of Indiana's GDL program took effect July 1, 2010. As of this date, the minimum age at which drivers can receive learner permits (Stage 1) and probationary permits (Stage 2) are increased. Drivers can receive a license (either Stage 1 permit or Stage 2 probationary) early if they enroll in and complete a certified driver education course, though the mandatory minimum holding period for licenses in Stages 1 and 2 is increased.

The Insurance Institute for Highway Safety (IIHS) created a GDL ranking system based on criteria implemented by states (IIHS, 2011). IIHS awards points for inclusion of more restrictive elements into a state GDL program. Ratings of *Good*, *Fair*, *Marginal*, and *Poor* are assigned based on the points received by the state. Indiana's GDL system is rated as *Good*, along with 37 other states. When comparing crash rates across these rankings, it is clear that those states with more restrictive GDL laws have better (i.e., reduced) crash outcomes (Figure 1).

Both in Indiana and nationwide, there has been a decrease in fatal crash rates among teen drivers. According to data from the Fatality Analysis Reporting System (FARS), the rate per 100,000 population of teen drivers involved in fatal crashes decreased 7 percent annually on average and 50 percent in total since 2000. Indiana's rate of teen drivers involved in fatal crashes is slightly higher than the national rate, but the Indiana rate could drop sharply if the anticipated GDL impacts are realized in coming years.

### IMPACT OF THE GDL SYSTEM ON INDIANA CRASH OUTCOMES

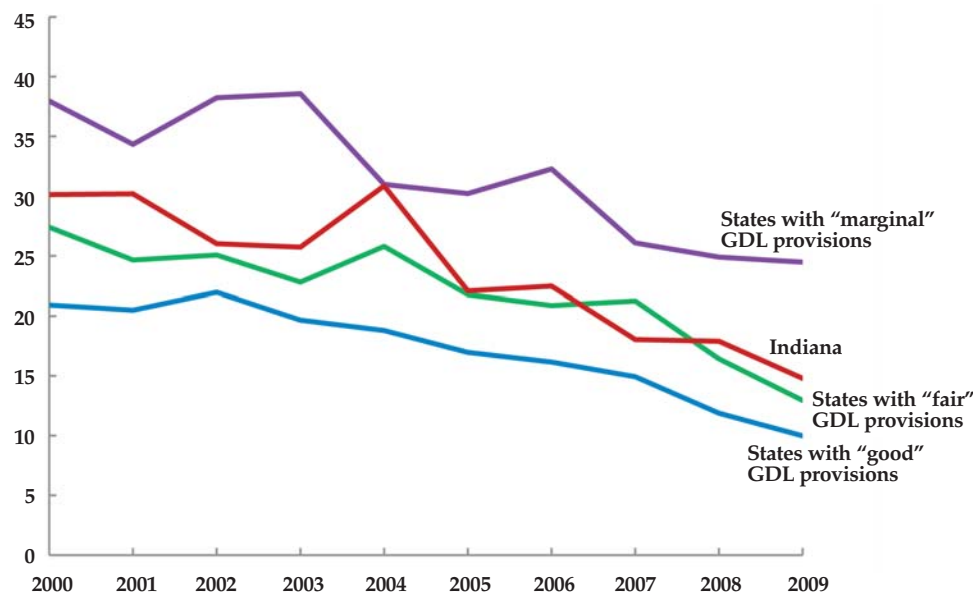
There are three primary ways in which GDL provisions are thought to reduce teen crashes, and hence three areas for assessing the impact of GDL provisions in Indiana:

(1) *Reductions in crashes involving drivers formerly qualified to receive a license but now disqualified because of minimum age provisions.* As of July 1, 2010, teens aged 15 years to 15 years, 179 days and teens aged 16 years, 30 days to 16 years, 179 days are no longer permitted to apply for a license. So,

we should expect a sharp reduction in crashes involving these age cohorts, as they are no longer legally allowed to drive.<sup>1</sup>

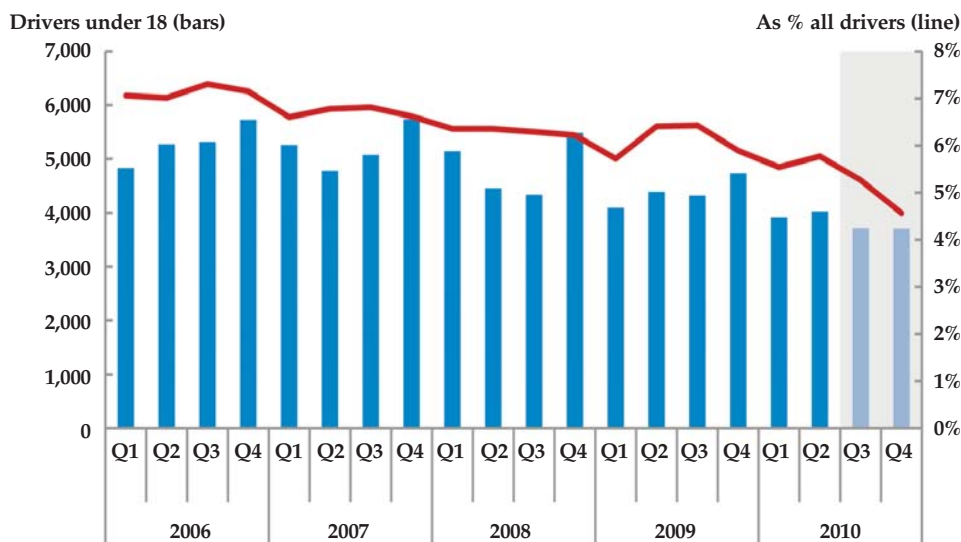
(2) *Reductions in crashes occurring during nighttime hours and those involving teen drivers with young passengers present.* Since the provisions are effective to all teen drivers that were issued a probationary license after June 30, 2009, we want to examine the incidence of crashes among teens in the first 180 days of receiving their license. As a proxy, we look at crashes involving drivers aged 16 years to 16 years, 6 months.

**Figure 1: Teen drivers involved in fatal crashes, per 100,000 population, 2000-2009**



Sources: Fatality Analysis Reporting System; US Census Bureau; Insurance Institute for Highway Safety.

**Figure 2: Drivers under age 18 involved in Indiana crashes, 2006-2010**



Source: Indiana State Police Automated Reporting Information Exchange System, as of January 10, 2011

**Table 2: Teen drivers involved in Indiana crashes by driver age, 2008-2010**

Age	2008				2009				2010				Percent change	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	2010 Q2-Q3	2010 Q2-Q4
15 years, 1-5 months	21	31	36	23	12	39	33	23	18	34	27	12	-20.6%	-64.7%
15 years, 6-11 months	29	43	47	35	46	53	67	38	26	43	35	26	-18.6%	-39.5%
16 years, 1-5 months	476	427	469	483	382	459	480	503	365	432	339	74	-21.5%	-82.9%
16 years, 6-11 months	901	889	805	974	695	822	797	833	724	815	682	671	-16.3%	-17.7%
17 years	1,891	1,692	1,694	1,992	1,534	1,679	1,626	1,682	1,513	1,531	1,463	1,682	-4.4%	9.9%
Under 18 Total	3,318	3,082	3,051	3,507	2,669	3,052	3,003	3,079	2,646	2,855	2,546	2,465	-10.8%	-13.7%

Source: Indiana State Police Automated Reporting Information Exchange System, as of January 10, 2011.

**Table 3: Crashes with at-fault teen drivers (ages 15 to 17), by crash severity, 2008-2010**

Crash severity	2008				2009				2010			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Fatal	13	12	5	11	4	12	11	3	5	7	8	5
Incapacitating	40	53	56	50	35	52	52	48	31	42	51	39
Non-incapacitating	524	625	692	626	469	674	723	578	489	596	577	462
Property damage	2,724	2,377	2,288	2,803	2,151	2,301	2,205	2,438	2,115	2,200	1,905	1,956
Total	3,301	3,067	3,041	3,490	2,659	3,039	2,991	3,067	2,640	2,845	2,541	2,462
% Fatal	0.4%	0.4%	0.2%	0.3%	0.2%	0.4%	0.4%	0.1%	0.2%	0.2%	0.3%	0.2%
% Fatal + Incap	1.6%	2.1%	2.0%	1.7%	1.5%	2.1%	2.1%	1.7%	1.4%	1.7%	2.3%	1.8%

Source: Indiana State Police Automated Reporting Information Exchange System, as of January 10, 2011.

(3) *Reductions in crashes caused by driver inexperience and risk-taking behaviors.* This component requires that the first cohort of drivers into the new system have adequate time to build driving experience. As of January 2011, this cohort of teens has had their licenses for a maximum of six months. This group still falls largely under restricted driving conditions as outlined in Table 1. A sufficient time series of crash data (post-GDL implementation) will not be available for analysis for six to twelve months.

Since there is not a sufficient dataset to analyze area (3), this brief focuses on areas (1) and (2). Subsequent publications on the topic, including *Traffic Safety Fact Sheets* and the *Indiana Crash Facts*, will address the differential effects on driving behavior.

Since 2006, the incidence and share of drivers under age 18 in crashes has decreased (Figure 2). As a share of all drivers in crashes, teen drivers decreased from just less than 6 percent in the second quarter of 2010 to 4.5 percent in quarter four. When segregated by ages corresponding to

GDL provisions, it is clear that the most prominent decrease occurred among drivers age 16-to-16.5 years (Table 2). This group is comprised of those who were formerly eligible for a probationary license (given that the teen took a driver education course) but under Indiana GDL statute are no longer eligible. From the second quarter of 2010 to the end of 2010 (i.e., the first six months of full GDL provisions), the incidence of drivers age 15-to-15.5 and 16-to-16.5 decreased 65 percent and 83 percent, respectively.

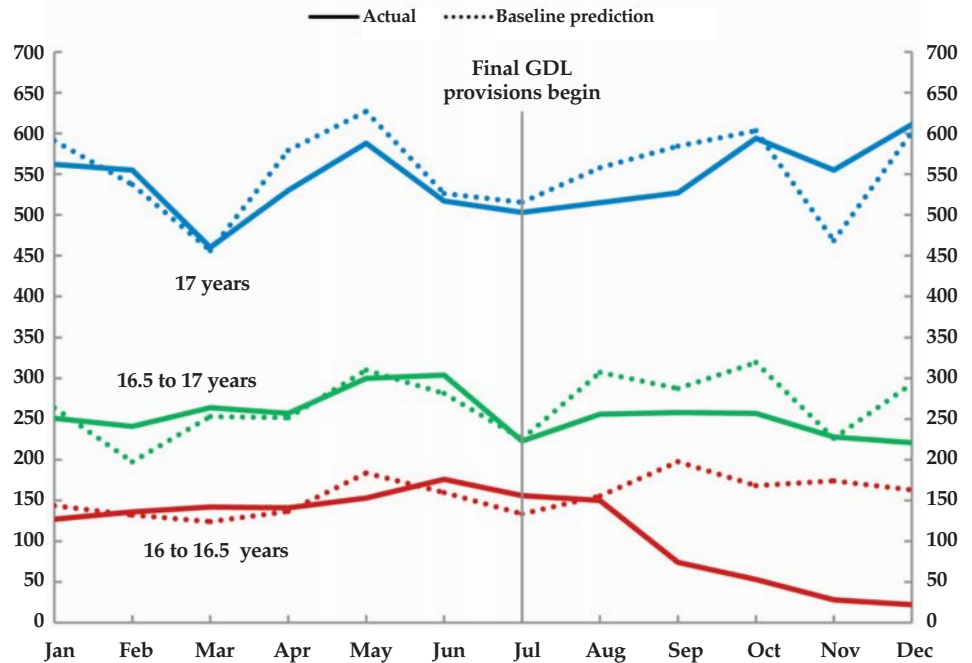
Crashes where a teen driver was at fault decreased in 2010, and especially after GDL implementation on July 1, 2010 (Table 3).<sup>2</sup> As a share of total crashes, fatal and serious injury crashes remained relatively constant, suggesting that the initial cohort of driver subject to GDL provisions have not yet gained full driving experience that GDL is meant to provide. An analysis six to twelve months from now should show some measureable difference in crash severity.

It appears that the biggest impact from GDL implementation occurred in August 2010, as the first cohort of newly licensed 16-year olds began

Stage 2 (Figure 3). Compared to expected trends for 2010, 16-to-16.5 year old drivers decreased from a monthly average of 146 (January through June) down to a low of 22 drivers in crashes in December. The incidence of 16-to-16.5 year old drivers in crashes decreased by about 70 per month below pre-GDL levels and by a total of nearly 400 through December 2010. Drivers in the 16.5-to-17 year old age group generally followed historical trends, but the count of drivers in crashes after GDL implementation was dampened slightly. This fact is likely due to the smaller number of older teens receiving a probationary license.

Indiana crash data do not show considerable differences for nighttime and passenger restrictions, though cell phone use rates did drop measurably. The incidence of drivers in crashes while teenage passengers were in the vehicle remained relatively constant since 2006, as did the percentage of all teen drivers who had teen passengers with them (Figure 4). In the last quarter of 2010, however, the share of all teen drivers in crashes who had teen passengers with them increased from three percent in 2009 quarter four to over six percent in 2010 quarter four, though the reason for this spike is unclear. The share of 16-year old driver crashes that occurred during nighttime-restricted hours remained at historical trends through 2010 (Figure 5). Since these provisions took effect a full year before the actual licensing standards, there may have been a lack of awareness among teen drivers. Unless law enforcement was strong enough to bring about changes in driving behavior, there may not have been enough motivation for teen drivers to alter driving times and to drive without young passengers. As shown in Table 4, the share of all teen drivers using a cell phone during the crash dropped 0.15 percentage points from 0.71 percent pre-law to 0.56 percent post-law. This change is noteworthy also because the reporting of cell phone use in crash reports has likely increased due to officer awareness of the issue.

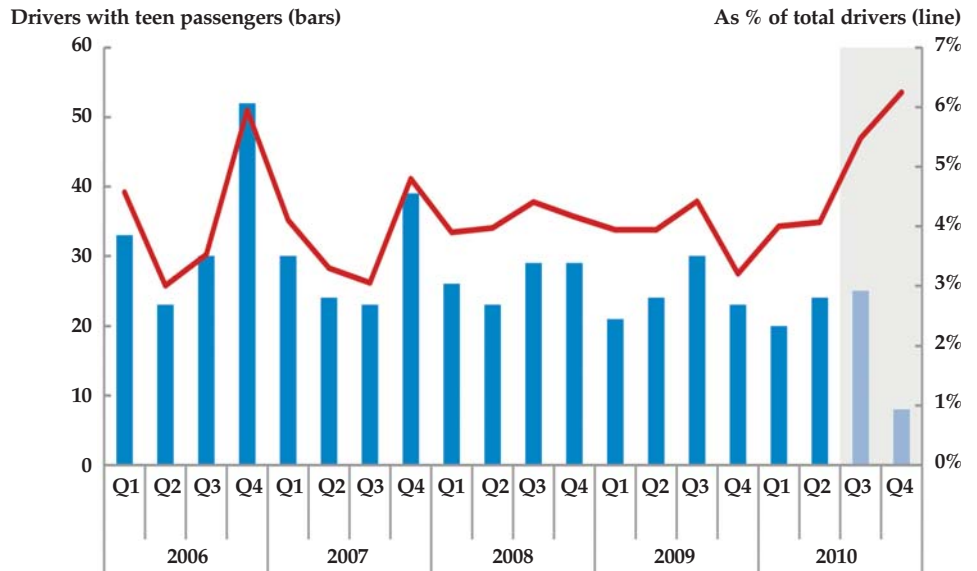
**Figure 3: Teen drivers involved in Indiana crashes by age and month, 2010**



Source: Indiana State Police Automated Reporting Information Exchange System, as of January 10, 2011.

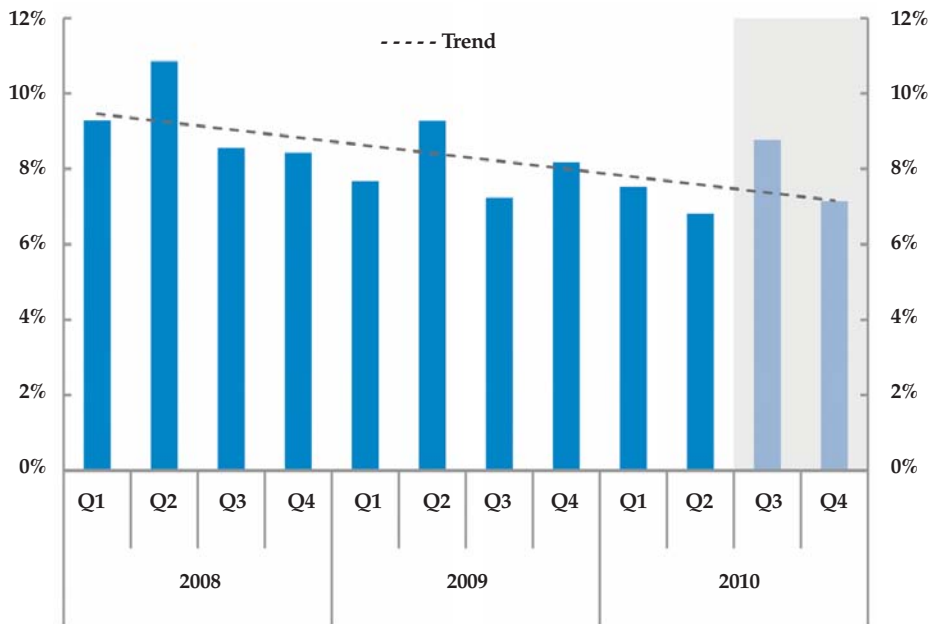
Note: *Baseline* prediction is the extrapolated value from historical trends in driver involvement. 2009 values were multiplied by the average annual growth rates to come up with a predicted (baseline) estimate for 2010.

**Figure 4: Teen drivers (ages 15 to 17) with teen passengers (ages 14 to 18) in Indiana crashes, 2006-2010**



Source: Indiana State Police Automated Reporting Information Exchange System, as of January 10, 2011.

**Figure 5: Share of 16-year old drivers involved in crashes that occurred between 10pm and 5am, 2008-2010**



Source: Indiana State Police Automated Reporting Information Exchange System, as of January 10, 2011.

**Table 4: Teen drivers (ages 15 to 17) using cell phones in crashes, 2006-2010**

	15 years	16 years	17 years	Under 18 years
<b>Drivers using a cell phone in crash</b>				
Pre-Law (1/1/2006 - 6/30/2009)	3	200	293	496
Post-Law (7/1/2009 - 12/31/2010)	2	52	84	138
<b>Drivers not using cell phone</b>				
Pre-Law (1/1/2006 - 6/30/2009)	1,661	28,705	39,030	69,396
Post-Law (7/1/2009 - 12/31/2010)	584	9,505	14,285	24,374
<b>Percent using a cell phone in crash</b>				
Pre-Law (1/1/2006 - 6/30/2009)	0.18%	0.69%	0.75%	0.71%
Post-Law (7/1/2009 - 12/31/2010)	0.34%	0.54%	0.58%	0.56%
Change	0.16	-0.15	-0.16	-0.15

Source: Indiana State Police Automated Reporting Information Exchange System, as of January 10, 2011.

Note: Pre-law refers to collisions occurring before July 1, 2009. Post-law refers to collisions after June 30, 2009.

**SUMMARY**

The Indiana graduated driver licensing system thus far appears to have had positive effects in reducing the number of teen drivers involved in crashes. As a share of all drivers in crashes, those under age 18 decreased from six to just over four percent. The majority of the impact has occurred in the provision that increases the minimum age for receiving a learner permit or probationary license. As of July 1, 2010, there are now a block of teens (ages 15 to 15.5 and 16 to 16.5) that must now wait longer to receive a license. Among this group, the incidence of drivers in crashes decreased by an average of about 100 per month from July to December 2010. From the second quarter to the fourth quarter of 2010, there was an 82 percent and 65 percent drop in the number of 16-year old and 15-year old drivers involved in crashes, respectively. Nighttime and passenger restrictions do not show measureable impacts in reducing crashes, and there has been a noticeable rise in the percentage of teen drivers with passengers in crashes.

The primary motivation for enacting GDL, to improve driver awareness, experience, and reasoning skills, has yet to be assessed with Indiana crash data. Follow-up research should include an analysis of the differential crash risks and driving behaviors most attributable to teen drivers. The GDL system should reduce bad driving behavior that ultimately leads to a lower likelihood of severe crashes among young drivers.

**Endnotes:**

<sup>1</sup>There are of course cases of teens in Stage 1 (learner permit) that are between the ages of 16 and 16.5. For simplicity of analysis, these cases are ignored and the general age categories are used.

<sup>2</sup>At fault applies when the investigating officer reports a contributing factor for a driver equal to the primary factor for the collision.

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This publication was prepared on behalf of the Indiana Criminal Justice Institute (ICJI) 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.

This publication is one of a series of fact sheets that, along with the annual Indiana Crash Fact Book, form the analytical foundation of traffic safety program planning and design in the state of Indiana. Funding for these publications is provided by the ICJI and the National Highway Traffic Safety Administration.

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

## Traffic Safety Project

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 collisions. 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 2010 vehicle crash data from the Automated Reporting Information Exchange System (ARIES), maintained by the Indiana State Police. This marks the fifth year of this partnership. 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 law enforcement officers. As of December 31, 2010, approximately 99 percent of all collisions are entered electronically through 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.

## 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.

## 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 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).

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The Center for Criminal Justice Research, one of two 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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