



**INDIANA TRAFFIC
SAFETY FACTS**

**STRATEGIES FOR
REDUCING DEATHS AND
INJURIES IN INDIANA
MOTOR VEHICLE
CRASHES**





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).

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INTRODUCTION

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 (PPI) has collaborated with the Indiana Criminal Justice Institute (ICJI) for the past ten years to analyze crash data from the Automated Reporting Information Exchange System (ARIES) database maintained by the Indiana State Police. Research findings have been summarized in a series of Fact Sheets over the years on various aspects of traffic collisions, including alcohol-impaired crashes, children, motorcycles, commercial vehicles, dangerous driving, occupant protection, young drivers, and non-motorists. Portions of the content in those reports are based on guidelines provided by the U.S. National Highway Traffic Safety Administration (NHTSA). These statistics are used to inform the public, as well as state and national policymakers, on matters of road safety and serve as the analytical foundation of traffic safety program planning and design in Indiana.

This year, PPI prepared a Problem Identification fact sheet summarizing Indiana traffic safety goals and problem areas identified by ICJI in their annual Indiana Highway Safety Plan (HSP). This publication includes a broad discussion of Indiana crash data trends related to the problem areas defined by ICJI in the HSP. In addition to the new Problem ID fact sheet, ICJI requested that PPI researchers investigate and prepare a report regarding effective countermeasures for aspects of traffic collisions covered by the series of Fact Sheets. This report provides a brief contextual review of NHTSA priority areas specific to Indiana crashes and then outlines strategies offered in the following NHTSA publication to assist in efforts to reduce deaths and injuries in Indiana motor vehicle crashes:

Goodwin, A., Thomas, L., Kirley, B., Hall, W., O'Brien, N., & Hill, K. (2015, November). *Countermeasures that work: A highway safety countermeasure guide for State highway safety offices*, Eighth edition. (Report No. DOT HS 812 202). Washington, DC: National Highway Traffic Safety Administration.

The NHTSA guide was intended as a reference tool for State Highway Safety Offices (SHSOs) in selecting science-based traffic safety countermeasures to address major highway safety problem areas. The authors summarize countermeasures in several problem areas with attention to effectiveness, cost, use, and implementation time. Only strategies that have demonstrated the most evidence of effectiveness as well as those that are used most regularly by SHSOs, and that could be supported by traditional highway safety grant programs are considered. Effectiveness assessments/ratings are based primarily on demonstrated reductions in crashes; however, changes in behavior and knowledge were considered when crash information was not available.

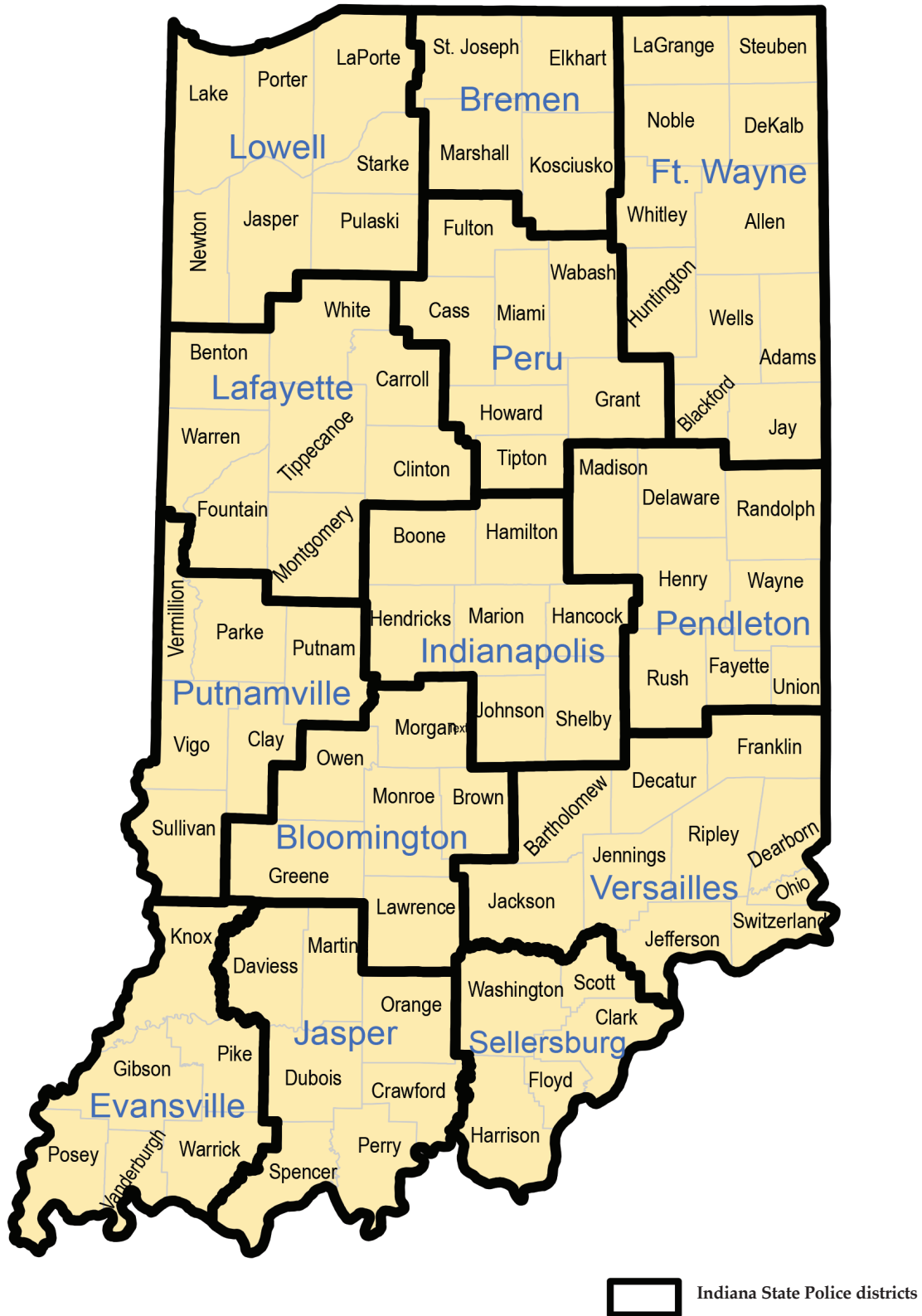
Through systematic data analysis as noted above, PPI and ICJI have identified problem areas as reflected by the Indiana Traffic Safety Fact Sheets and which are included in this report as primary focus areas:

- Speeding
- Impaired driving
- Occupant protection
- Young drivers
- Non-motorists
- Motorcycles

Each section in this report includes the following:

- An overview of trends in the identified focus area, including scale and highlights of specific aspects of the problem area
- Indiana law regarding specific area of concern
- An Indiana county-level map depicting a key measure of each focus area. Each map also includes an overlay of Indiana State Police district boundaries (see Map 1)
- Brief summaries of NHTSA recommended strategies drawn from Goodwin et al., countermeasures guide are included. Given the number of strategies covered in the guide, this report focuses on summaries of countermeasures drawn from the NHTSA report that have 3 star effectiveness ratings or higher (up to 5). In the case of impaired driving and occupant protection, given the large number of countermeasures that Goodwin et al., address, PPI summarized strategies that received 4 or 5 star effectiveness ratings Goodwin et al., measured effectiveness by reduction in crashes or injuries, as follows:
 - 3 star rating—likely to be effective based on balance of evidence from high quality evaluations or other sources;
 - 4 star rating—demonstrated to be effective in certain situations; or
 - 5 star rating—likely to be effective based on balance of evidence from high-quality evaluations or other sources.
- Summaries of strategies also cover NHTSA assessments of
 - 1) *implementation costs* associated with the required use of facilities, staff, training, equipment, and publicity;
 - 2) *use*, assessed by a number of states or communities that have employed specific countermeasures; and
 - 3) *time to implement* specific strategies, ranging from three months or less to more than one year time frames.

Map 1. Indiana counties by Indiana State Police district, 2015





INDIANA TRAFFIC SAFETY FACTS



Speeding



OVERVIEW

A collision is defined as speed-related in Indiana ARIES data if any of the following conditions is met: *Unsafe speed or speed too fast for weather conditions* is listed as the primary or a contributing factor of the collision; or a vehicle driver is issued a speeding citation. As shown in Figure 1.1, 21,986 speed-related collisions occurred in Indiana in 2015 and 27 percent of all fatal collisions involved speeding (not shown in exhibit). The rate of fatal injuries per 1,000 involved in speed-related collisions rose from 5.6 in 2011 to a five-year high of 7.7 in 2013, declined to 5.2 in 2014 and rose again in 2015 to 6.6 (Figure 1.2). As Table 1.1 illustrates, between 2011 and 2015, the relative proportion of speed-related crashes to all crashes decreases with increasing driver age. Among drivers involved in collisions, young males are the most likely to be speeding. In 2015, 13 percent of male drivers and 9 percent of female drivers in the 15- to 20-year old age group were speeding at the time of the collision. Only 3 percent of male drivers and 2 percent of female drivers in the 75 and over age group were reported to be speeding in collisions in 2015. Since 2011, in Indiana, the number of legally impaired drivers (i.e., blood alcohol content of 0.08 g/dL or higher) involved in speed-related collisions rose from 851 in 2011 to 904 in 2012, and fell to 857 in 2015 (Figure 1.3). The proportion of drivers involved in speed-related collisions that were also impaired at the time of collision declined from 5.7 in 2012, and to a five-year low of 3.6 in 2014.

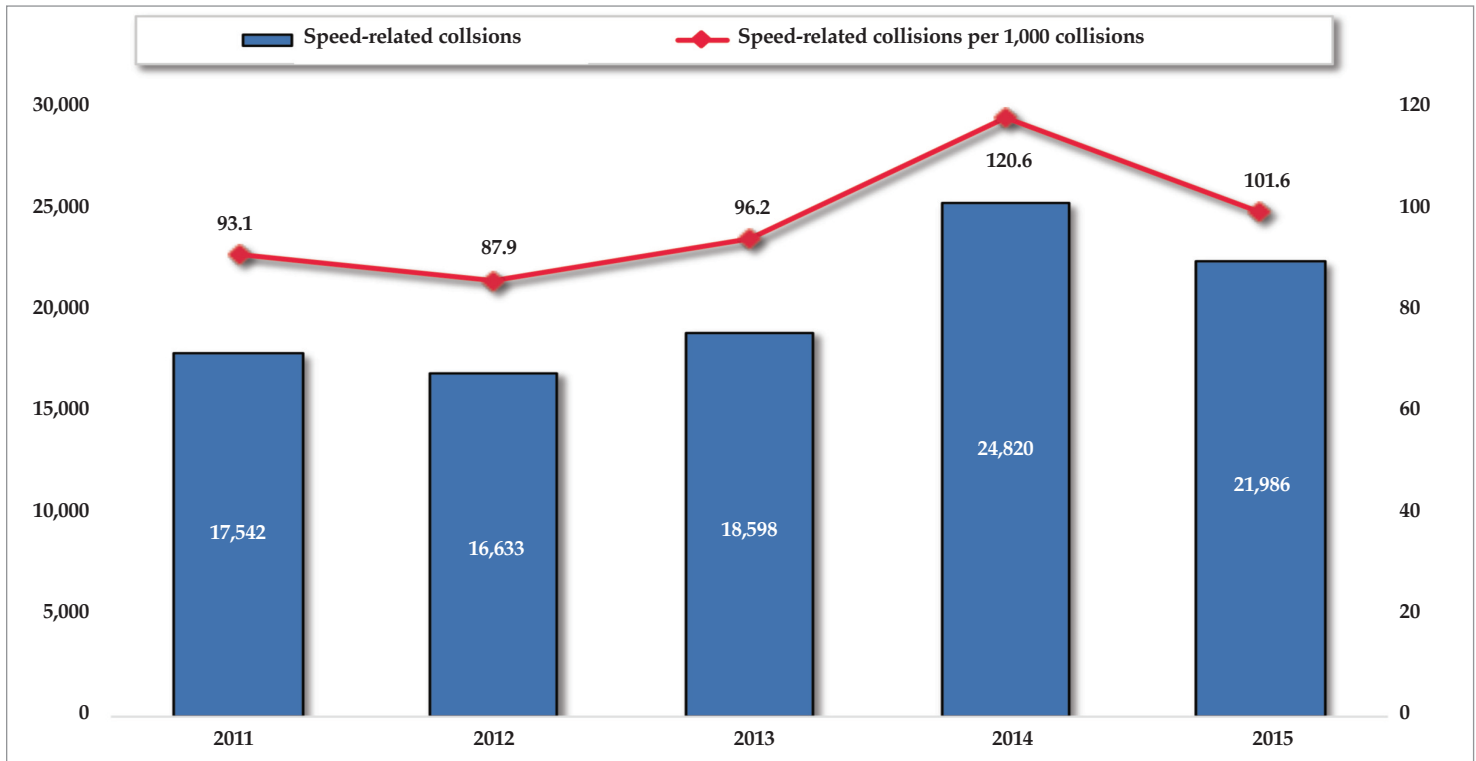
INDIANA SPEEDING AND AGGRESSIVE DRIVING LAWS

Indiana roadway speed limits are regulated by the Indiana Department of Transportation. These limits may be altered by local jurisdictions or the Indiana Department of Transportation. Speed limits are indicated by roadway signage. Individuals who drive at speeds greater than indicated limits are in violation of Indiana state law. Drivers caught speeding are issued a citation depending on roadway conditions, the extent of the driver's speed, and special hazards present, such as construction zones, school zones, or pedestrian crossings. Failing to abide by speed limits can result in fines, points on the driver's license, and enrollment into driver education courses. Drivers in violation of speed limits can face increased penalties depending on the presence of special hazard zones indicated above. Those who commit multiple infractions within one year may also have driving privileges revoked for a limited time.

Indiana state law recognizes aggressive driving as an unsafe driving behavior. A person engages in aggressive driving if the person commits at least three of the following infractions: Following a vehicle too closely in violation of IC 9-21-8-14, unsafe operation of a vehicle in violation of IC 9-21-8-24, overtaking another vehicle on the right by driving off the roadway in violation of IC 9-21-8-6, unsafe stopping or slowing a vehicle in violation of IC 9-21-8-26, unnecessary sounding of the horn in violation of IC 9-19-5-2, failure to yield in violation of IC 9-21-8-29 through IC 9-21-8-34, failure to obey a traffic control device in violation of IC 9-21-8-41, driving at an unsafe speed in violation of IC 9-21-5, repeatedly flashing the vehicle's headlights. Committing three consecutive infractions within one drive results in increased fines and penalties.

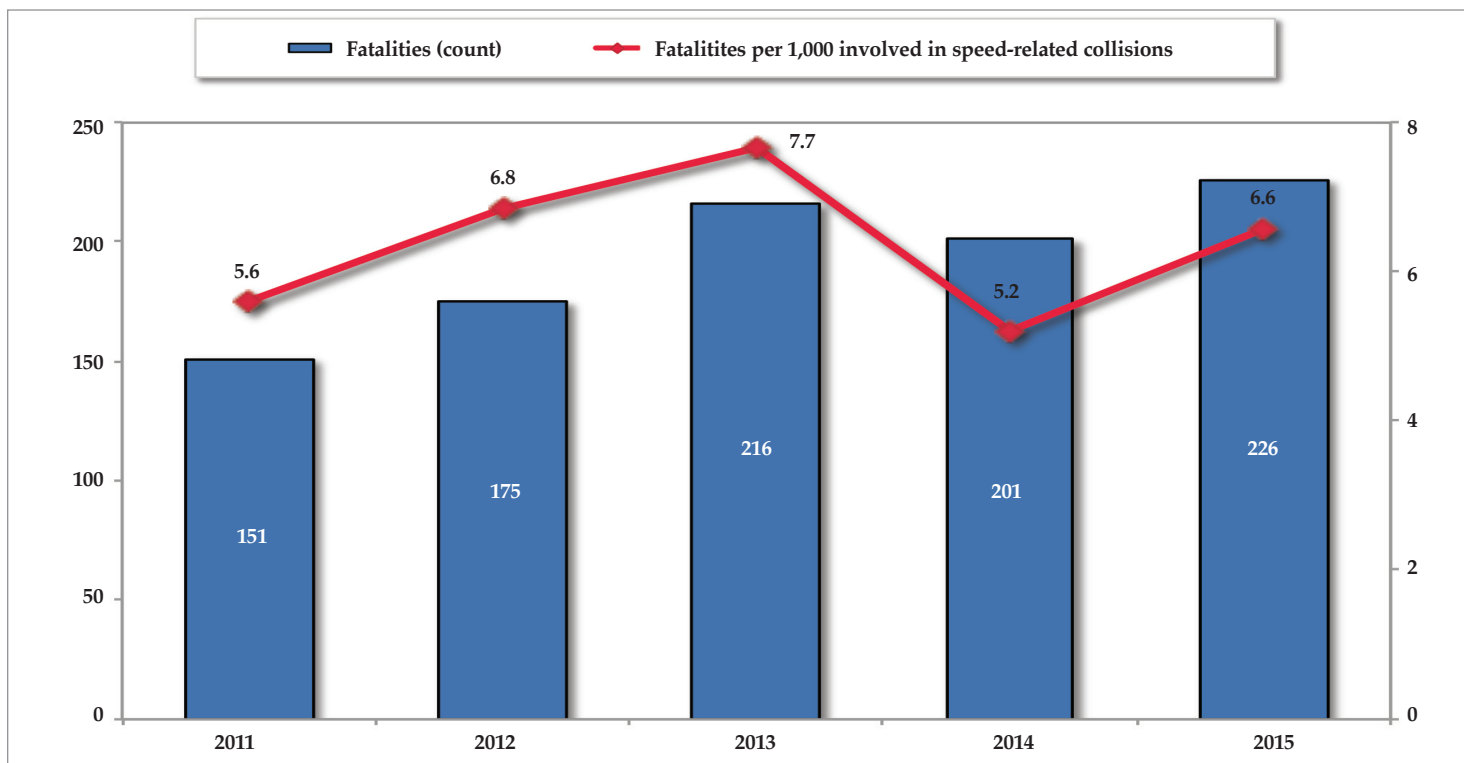
Sources: IC 9-21-8-6, IC 9-21-8-14, IC 9-21-8-24, IC 9-21-8-26, IC 9-21-8-29, IC 9-21-8-34, IC 9-21-8-41, IC 9-21-5, IC 9-19-5-2; available at iga.in.gov/legislative/laws/2016/ic/titles/009/

Figure 1.1. Indiana speed-related collisions, 2011-2015



Source: Indiana State Police Automated Reporting Information Exchange System, as of March 17, 2016

Figure 1.2. Indiana traffic fatalities in speed-related collisions, 2011-2015



Source: Indiana State Police Automated Reporting Information Exchange System, as of March 17, 2016

Table 1.1. Drivers speeding as a percent of all drivers involved in Indiana collisions, by age group and gender, 2011-2015

	2011		2012		2013		2014		2015		Annual rate of change, 2011-15	
Age group	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
15-20	8.1%	11.9%	7.3%	12.2%	8.9%	12.4%	9.8%	14.0%	8.7%	13.0%	1.8%	2.2%
21-24	6.9%	10.2%	5.9%	9.4%	7.6%	10.4%	9.5%	12.7%	7.5%	11.2%	1.8%	2.5%
25-34	5.6%	7.5%	4.7%	7.5%	5.5%	8.5%	7.5%	10.7%	5.9%	8.7%	1.4%	3.8%
35-44	4.5%	5.6%	3.9%	5.4%	4.5%	5.7%	5.7%	7.6%	4.3%	6.2%	-0.9%	2.6%
45-54	3.5%	4.7%	3.4%	4.3%	3.3%	4.5%	4.9%	6.2%	3.7%	5.1%	1.5%	2.0%
55-64	2.5%	3.5%	2.5%	3.5%	2.6%	3.7%	3.7%	5.2%	2.8%	4.0%	2.6%	3.5%
65-74	1.9%	2.7%	2.0%	2.8%	2.1%	2.8%	2.4%	3.8%	1.9%	3.3%	0.0%	4.5%
75 +	1.7%	2.2%	1.7%	2.2%	1.6%	2.2%	2.0%	3.1%	1.7%	2.5%	0.3%	4.0%
All ages	4.9%	6.6%	4.3%	6.4%	5.0%	6.9%	6.4%	8.6%	5.1%	7.3%	1.0%	2.6%

Low < < > > High

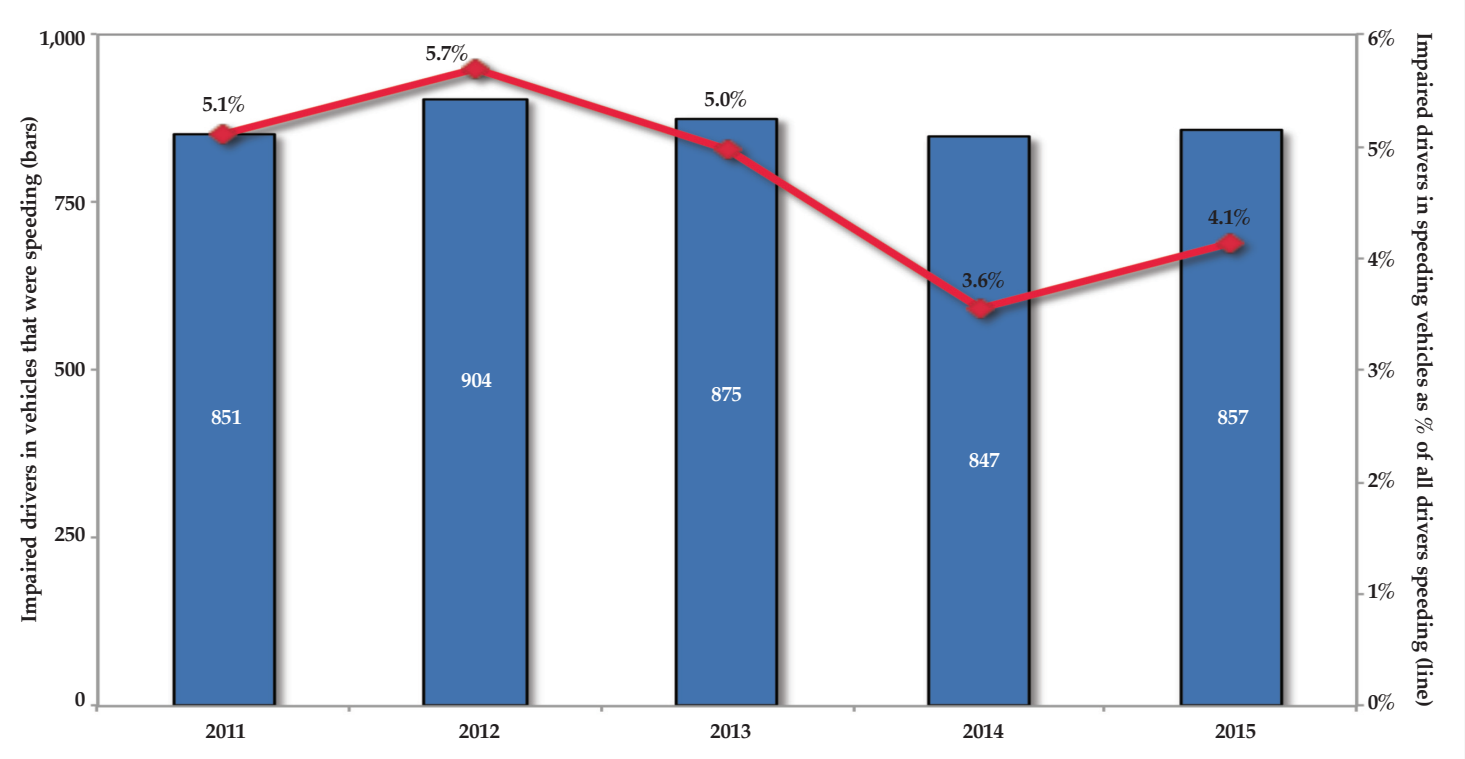
Sources: Indiana State Police Automated Reporting Information Exchange System, as of March 17, 2016; Indiana Bureau of Motor Vehicles, as of April 20, 2016.

Notes:

- 1) Data limited to drivers with valid gender and age reported.
- 2) Excludes drivers under 15 years old.



Figure 1.3. Drivers in vehicles that were speeding in Indiana collisions, by alcohol impairment, 2011-2015

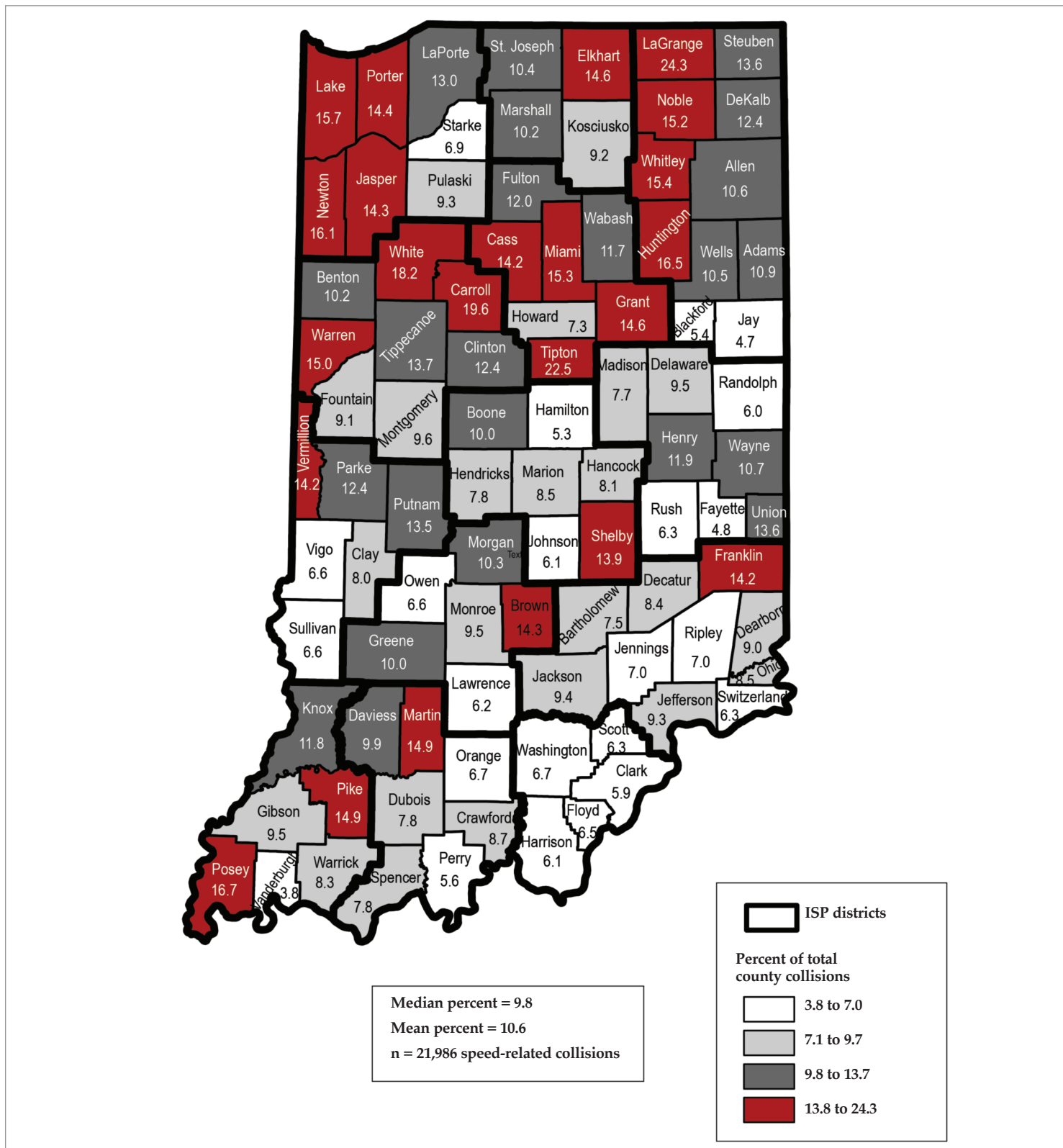


Source: Indiana State Police Automated Reporting Information Exchange System, as of March 17, 2016

Map 2 depicts the percentage of county collisions that were speed-related in 2015 with Indiana State Police (IPS) districts. The median county percent of speed-related collision was 9.8, and many counties with the

highest percentages of speed-related collisions were clustered in the northern half of the state

Map 2. Percentage of county collisions that were speed-related, 2015



Source: Indiana State Police Automated Reporting Information Exchange System, as of March 17, 2016



NHTSA RECOMMENDED STRATEGIES AND COUNTERMEASURES

The NHTSA publication, *Countermeasures that work: A highway safety countermeasure guide for State highway safety offices*, recommends a number of strategies for addressing speeding (Goodwin et al., 2015). Broadly, these include the following:

1. Speed limits
2. Automated enforcement
3. Public information supporting enforcement

Three specific countermeasures that NHTSA found to be effective are highlighted below. Each of the following received at least a:

- 3 star rating—likely to be effective based on balance of evidence from high quality evaluations or other sources;
- 4 star rating—demonstrated to be effective in certain situations; or
- 5 star rating—likely to be effective based on balance of evidence from high-quality evaluations or other sources.

Speed Limits – 5 star rating

Speeding is a major contributing factor to accident, injury, and fatality rates. Lower speed limits can be an effective method to reduce speeds and crash rates. The 55 mph National Maximum Speed Limit (NMSL) was enacted in 1974 to conserve fuel. As a result travel decreased, speeds decreased on roads where the speed limit was lowered to 55 mph, and total traffic fatalities declined by 9,100 from 1973. The slower and more uniform speeds due to the 55 mph limit were responsible for saving between 3,000 and 5,000 lives in 1974 (Transportation Research Board, 1984).

Reductions in speed limits require more than just signage replacement. Supporting established limits and ensuring continued compliance requires active enforcement and supportive adjudication (NHTSA, FHWA, & FMCSA, 2014). Research suggests that perceptions of safe speeds are influenced by drivers' expectations of what speed above the limit could result in a citation (Mannering, 2009). Publicity campaigns can create general public awareness to speed limit changes and increase compliance.

The use of variable speed limit zones has been implemented in some areas as a means of increasing traffic flows and ensuring drivers remain aware of speed limits changes. As of 2007, six US cities employed enforceable, variable speed limits on freeways (posted on changeable message signs) (RITA, 2007). A study of safety effects of variable limits conducted on freeways in the St. Louis metropolitan area found crash reductions of eight percent (Bham et al., 2010). Overall, speed limit changes and reductions can generate positive effects, but continued enforcement and awareness measures may be necessary to maintain compliance and full benefits of such initiatives. Goodwin et al., found this strategy to involve minimal cost (2015).

Automated Enforcement – 5 star rating

Automated enforcement practices include the use of red light and speed cameras. Automated red light cameras take photographs of vehicles that illegally enter intersections, whereas speed cameras take photographs of vehicles exceeding a certain speed. Photographs are accompanied by citations and fines for the infraction and mailed to the registered owner of the vehicle. First used in 1993 in the United States, red light cameras were being used in about 460 communities in 24 states, the District of Columbia, and the US Virgin Islands by June 2015 (NCSRLR, 2002). As of the same time period, speed cameras were also employed in approximately 134 jurisdictions in 12 States, the District of Columbia, and the U.S. Virgin Islands, including four statewide work zone automated enforcement programs in Illinois, Maryland, Oregon, and Washington (GHSA, 2015b; IIHS, 2015a). Currently, Indiana has no state laws pertaining to red light or speed cameras.

Areas that implement the use of automated camera systems have found significant positive effects associated with their use. Goodwin et al., found that extensive research has been conducted on the use of such systems. Results demonstrate automated camera systems increase rear-end collisions, reduce side-impact accidents (the target group), and reduce overall collisions severity (Aeron-Thomas & Hess, 2006; Decina, Thomas, Srinivasan, & Staplin, 2007; Maccubbin, Staples, & Salwin, 2001; McGee & Eccles, 2003; Retting, Ferguson, & Hakkert, 2003; Washington & Shin, 2005; WHO, 2004). Results yield some negative outcomes, but these effects are outweighed by the positive implications of automated traffic camera enforcement. Most importantly, localized studies have found crash severity is significantly reduced where automated camera systems are in place, which is associated with a reduction in injury rates and fatalities.

Goodwin et al., note that when initially implementing these approaches can incur significant costs and time (2015). Maccubbin et al., found that, in 2001, red-light film-based camera systems cost approximately \$50,000 to \$60,000, digital systems were estimated at \$100,000 per purchase and \$25,000 to install. Monthly operating costs were about \$5,000 (2001). Many jurisdictions employ private vendors to install and maintain camera systems, as well as process images and violations. However, a significant portion of fines generated from red-light citations is generally used



to defray program costs (Washington & Shin, 2005). Additional research is needed to verify that accident rate reductions in enforcement zones reduce crash rates. Automated enforcement program and operational guides including problem identification, establishing and maintaining effective enforcement program using speed or red light cameras have been released by NCHRP (2012), and NHTSA and FHWA (2008).

Public Information Supporting Enforcement – 3 star rating

Speed limit changes rely heavily on effective community outreach and public awareness efforts to generate beneficial results. Most research suggests that essential components of successful speed and aggressive driving enforcement programs are effective, highly visible outreach campaigns (NCHRP, 2003; NHTSA, 2000). Continued public awareness of speed reduction campaigns can promote speed limit compliance. This can be accomplished by pre-testing campaign messages to ensure target audience relevance and that such efforts reach intended audiences with sufficient duration and intensity (Preusser, Williams, Nichols, Tison, & Chaudhary, 2008). Combining these public awareness campaigns with targeting specific areas and drivers for enforcement can accomplish a significant change in driver behavior.



Considering most awareness campaigns are combined with other methods to achieve speed limit compliance, there are numerous instances where positive results can be found. Based on a recent meta-analysis of 67 worldwide studies regarding the efficacy of road safety campaigns, researchers found a general campaign effect of nine percent reduction in crashes (Phillips, Ulleberg, & Vaa, 2011). Currently, Indiana has two speed-related community awareness campaigns: Stop Speeding Before Speeding Stops You, and Obey the Sign or Pay the Fine. Additionally, every October Indiana participates in a Drive Safely Work Week sponsored by the Network of Employers for Traffic Safety.



RESOURCES

- Federal Highway Administration (FHWA) Safety Office, Speed Management Safety page and links: safety.fhwa.dot.gov/speedmgt/
 - Speed Concepts: Informational Guide—http://safety.fhwa.dot.gov/speedmgt/ref_mats/fhwasa10001/
 - Methods and Practices for Setting Speed Limits— http://safety.fhwa.dot.gov/speedmgt/ref_mats/fhwasa12004/
- AASHTO Highway Safety Manual—www.highwaysafetymanual.org/
 - AASHTO Strategic Highway Safety Plan, including the NCHRP Report 500 series guides on reducing crashes—www.trb.org/Main/Blurbs/152868.aspx
- Centers for Disease Control, Community Speed Reduction and Public Health
- Resources In Action resources— www.cdc.gov/healthyplaces/healthtopics/transportation/practice.htm
- Crash Modification Factors Clearinghouse—www.cmfclearinghouse.org/
- NCHRP Report 504, Design Speed, Operating Speed, and Posted Speed Practices—onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_504.pdf
- NCHRP Report 622, *Effectiveness of Behavioral Highway Safety Countermeasures*—www.nap.edu/openbook.php?record_id=14195
- Transportation Research Board Special Report 254, Managing Speed: Review of *Current Practice for Setting and Enforcing Speed Limits*—<http://onlinepubs.trb.org/onlinepubs/sr/sr254.pdf>
- Global Road Safety Partnership, *Speed Management: Road Safety Manual for Decision-makers and Practitioners*—www.who.int/roadsafety/projects/manuals/speed_manual/en/
- Transportation Research Information Services (TRIS) database (bibliographic database of transportation-related research)—tris.trb.org

NHTSA resources

- Aggressive Driving—www.nhtsa.gov/Aggressive
- Enforcement and Justice Services— www.nhtsa.gov/Driving+Safety/Enforcement+&+Justice+Services
- Research and Evaluation—www.nhtsa.gov/Driving+Safety/Research+&+Evaluation
- Behavioral Safety Research Reports—ntlsearch.bts.gov/repository/ntlc/nhtsa/index.shtm

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INDIANA TRAFFIC SAFETY FACTS



Impaired Driving



OVERVIEW

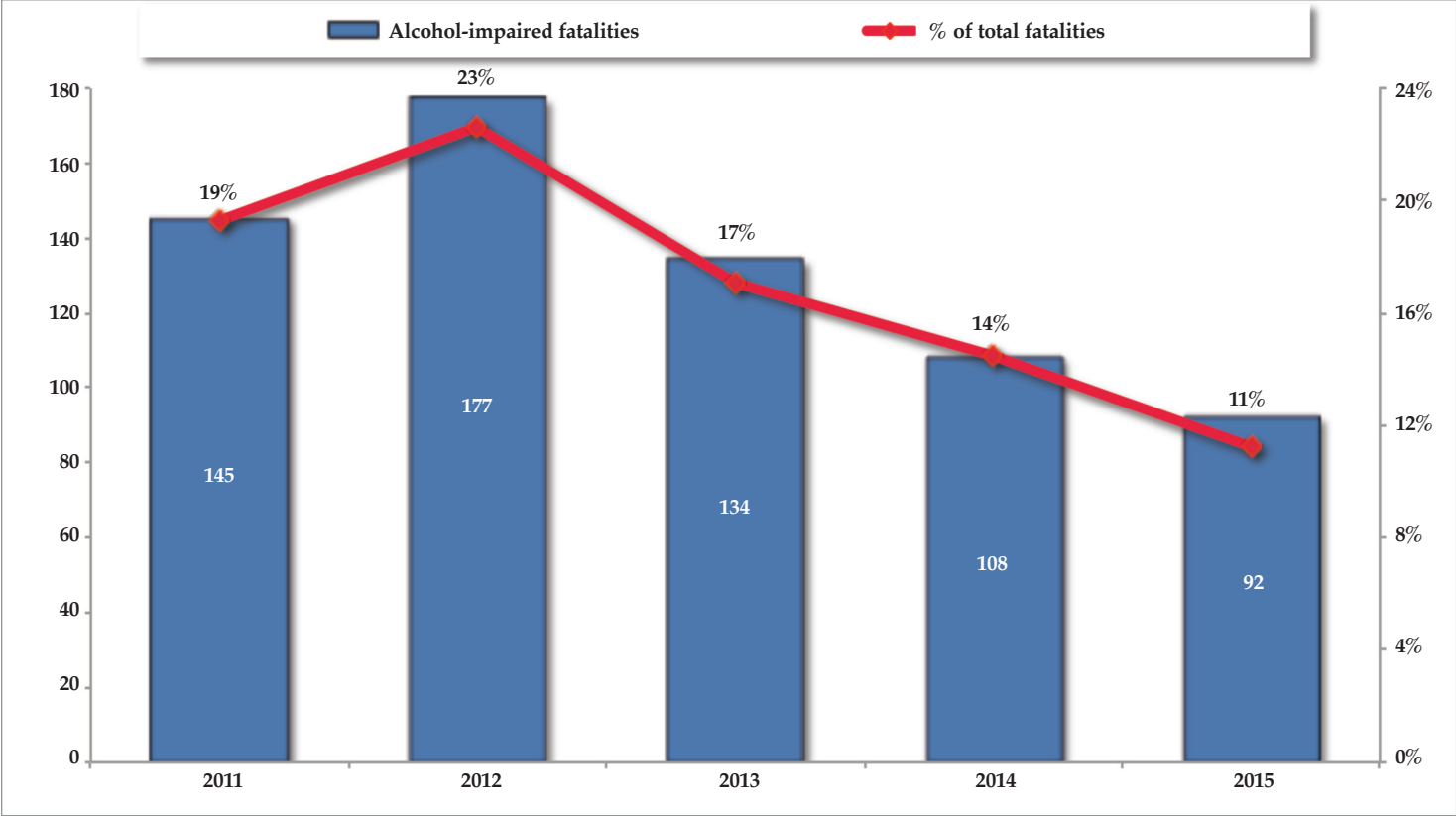
The National Highway Traffic Safety Administration (NHTSA) defines drivers as *alcohol-impaired* when their blood alcohol concentration (BAC) is 0.08 grams per deciliter (g/dL) or higher (NHTSA DOT HS 812 231, 2015). In the US in 2014 (latest data available), 9,967 or 31 percent of all traffic fatalities in motor vehicle traffic crashes involved an impaired driver. In Indiana, as shown in Figure 2.1, both the number (92) and percent (12 percent) of 2015 Indiana traffic fatalities that involved an impaired driver were at a five-year low (Sapp, 2016).¹ Among all age groups, drivers in Indiana aged 21 to 24 had the highest rates of alcohol impairment in collisions (Nunn, 2016). Similarly, in the US in 2014, the 21- to 24-year-old age group had the highest percentage of drivers with BACs of .08 g/dL or higher (30%) in fatal crashes (NHTSA DOT HS 812 231, 2015). In each of the five years included in Table 2.1, male drivers in Indiana were three times more likely to be impaired than female drivers in all collisions (calculated from the table).

INDIANA IMPAIRED DRIVING LAW

In Indiana, drivers believed to be impaired or under the influence of alcohol or a controlled substance must submit to a certified breath test. Drivers who refuse to submit to the test will have their license automatically suspended for one year. Current Indiana law requires that drivers convicted of a first offense, driving with a blood alcohol concentration (BAC) of over .08, will face fines in excess of \$300 (up to a maximum of \$5,000), with jail time ranging from five days to one year. Following a DUI conviction drivers will be required to hold SR-22 high risk insurance for three years. In addition, drivers may be ordered to receive alcohol and drug assessments, participate in up to 180 hours of community service, and other terms of probation. These penalties may be increased if BAC levels are higher than .15. Drivers facing a second offense will face imprisonment for a minimum of five days and up to three years. The driver's vehicle will be impounded, and driving privileges will be suspended for no less than 180 days and up to two years. Fines for a second offense can reach up to \$10,000. Drivers may also be required to participate in alcohol and drug assessments as well as up to 360 hours of community restitution or service. Drivers facing a third offense (or higher) reflect penalties of a second offense, with enhancements of some penalties. Offenders will be imprisoned for at least ten days and up to three years. License suspension at this stage can last from at least one year to as long as 10 years. Drivers facing three or more offenses may also be labeled as habitual traffic violators, which accompany additional imprisonment term.

Sources: IC 9-30-5, IC 9-30-5-15; available at iga.in.gov/legislative/laws/2016/ic/titles/009/

Figure 2.1. Indiana alcohol-impaired traffic fatalities as a percent of total traffic fatalities, 2011-2015



Source: Indiana State Police Automated Reporting Information Exchange System (ARIES), as of March 17, 2016

Note: When considering the reported decreases in 2015 alcohol-impaired crashes and fatalities, it is important to note that these numbers are likely to increase somewhat once BAC results reported after the March 17, 2016, extract are analyzed.

¹These 2015 numbers are likely to increase, however, once BAC results reported after the March 17, 2016, extract are analyzed. It is also important to note that it is possible that a large portion of impaired driving in Indiana crashes goes unreported; for example, among all drivers involved in fatal collisions in 2015 (n=1,151) as reported by ARIES, only 62 percent were tested for drugs and/or alcohol, 38 percent had reported drug test results, and 36 percent had reported BACs.

Table 2.1. Rates of alcohol-impaired Indiana drivers per 100,000 licensed drivers, by age group and gender, 2011-2015

	Rate of alcohol-impaired drivers per 100,000 licensed drivers									
Age group	2011	2012	2013	2014	2015					
Alcohol-impaired drivers in all collisions	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
All drivers	165.6	55.5	172.4	60.1	160.2	52.6	151.9	48.8	155.7	54.4
15-20	188.5	47.4	164.4	60.0	146.5	47.1	143.5	36.0	114.5	39.9
21-24	441.1	160.2	438.8	159.7	420.7	130.6	399.2	131.0	429.3	133.4
25-34	258.4	93.2	295.7	104.2	274.4	100.5	258.3	90.8	259.8	94.7
35-44	173.6	67.5	194.3	80.2	185.1	65.9	170.6	64.5	170.9	72.6
45-54	140.6	54.1	142.2	55.7	139.5	45.9	129.9	44.8	142.9	58.1
55-64	82.3	20.5	82.8	20.0	71.9	20.6	73.9	16.6	80.4	23.6
65-74	39.0	5.3	37.6	5.0	30.1	6.0	31.4	9.0	37.4	8.1
75 and older	10.1	0.0	16.7	0.7	7.7	6.4	13.4	0.0	15.7	0.6
Alcohol-impaired drivers in fatal collisions										
All drivers	5.6	0.7	7.0	0.7	4.7	0.8	3.9	0.6	3.2	0.6
15-20	4.5	0.6	6.7	0.0	2.3	1.2	2.3	0.0	1.7	0.6
21-24	11.5	2.0	14.2	2.5	13.6	3.2	5.5	1.3	6.8	0.6
25-34	7.7	1.8	11.8	1.4	8.7	1.3	7.1	1.3	4.7	2.3
35-44	8.3	1.1	9.1	1.4	6.3	1.1	4.4	1.3	4.7	0.5
45-54	5.7	0.0	6.4	0.5	3.0	0.2	4.8	0.7	2.8	0.2
55-64	3.3	0.3	2.4	0.0	2.1	0.3	2.3	0.0	2.3	0.2
65-74	0.5	0.0	2.3	0.0	1.3	0.0	1.2	0.0	0.4	0.0
75 and older	0.0	0.0	1.6	0.0	0.0	0.6	0.0	0.0	1.5	0.0

Lower rate

Higher rate

Sources: Indiana State Police Automated Reporting Information Exchange System, as of March 17, 2016; Indiana Bureau of Motor Vehicles, as of April 20, 2016.

Notes:

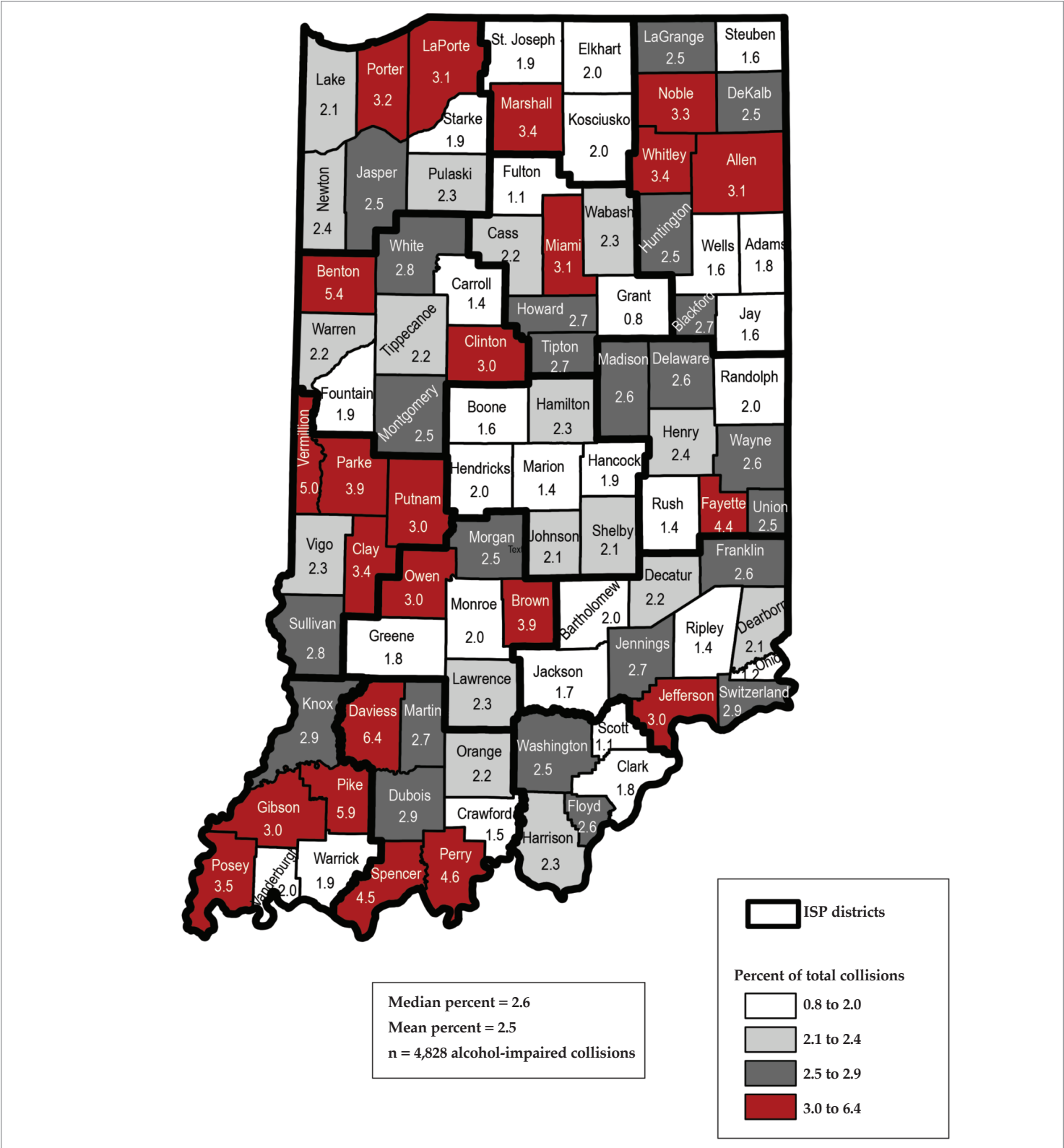
- 1) Excludes drivers with unknown age or age under 15 years.
- 2) Conditional formatting applies to a single year across both gender categories and is calculated for each impaired driving collision type presented (all collisions and fatal collisions).
- 3) Due to changes in Indiana BMV-reported licensing counts and ARIES-reported BAC results, rates cannot be compared directly to previous years' exhibits.
- 4) Excludes cases with reported BAC greater than 0.59 g/dL.



Map 3 depicts percentage of county collisions that involved an impaired driver. In 2015, the mean percentage of alcohol-impaired collisions was 2.6 percent. Daviess (6.4 percent) and Pike (5.9 percent) counties had the

highest percentages of alcohol-impaired collisions, and Grant (0.8 percent), Scott (1.1 percent), and Ohio (1.2 percent) counties had the lowest percentage of alcohol impaired collisions.

Map 3. Percentage of county collisions that involved an impaired driver, 2015



Source: Indiana State Police Automated Reporting Information Exchange System, as of March 17, 2016

NHTSA RECOMMENDED STRATEGIES AND COUNTERMEASURES

The NHTSA publication, *Countermeasures that work: A highway safety countermeasure guide for State highway safety offices*, recommends a number of strategies for addressing impaired driving (Goodwin et al., 2015). Broadly, these include the following:

1. Administrative license revocation (ALR)/Administrative license suspension (ALS)
2. Publicized sobriety checkpoints
3. High visibility saturation patrols
4. Preliminary Breath Test devices (PBTs)
5. Passive alcohol sensors
6. Driving while impaired (DWI) courts
7. Limits on diversion and plea agreements
8. Alcohol problem assessment, treatment
9. Alcohol ignition interlocks
10. Vehicle and license plate sanctions
11. DWI offender monitoring
12. Lower blood alcohol concentration (BAC) limit for repeat offenders
13. Alcohol screening and brief intervention
14. Minimum drinking age 21 laws

Fourteen specific countermeasures that NHTSA found to be particularly effective are highlighted below. Each of the following received at least a:

- 4 star rating—demonstrated to be effective in certain situations; or
- 5 star rating—likely to be effective based on balance of evidence from high-quality evaluations or other sources.

Administrative license suspension (ALS)/Administrative license revocation (ALR) – 5 star rating

ALS/ALR laws remove impaired drivers from US roadways. Drivers who refuse to take a BAC test can have their driver's license suspended under ALS laws. Administrative license revocation (ALR) laws allow law enforcement officials to revoke licenses of drivers who refuse BAC tests. Under ALR, drivers must re-apply for a license once the suspension period ends. When drivers refuse to complete a BAC test, ALS and ALR laws can be applied immediately. Drivers in most jurisdictions can request an occupational or hardship license covering part or all of the revocation or suspension period (NHTSA, 2008a). ALR laws include a 90-day minimum license suspension (NHTSA, 2006a). The National Committee on Uniform Traffic Laws and Ordinances has created a model ALR law (NCUTLO, 2007). Currently, Indiana goes beyond recommended standards, and has implemented a suspension period of 180 days.

Studies confirm that ALR and ALS laws contribute a number of positive impacts. One summary of 12 evaluations through 1991 found ALR and ALS laws resulted in fewer crashes by an average of 13 percent (Wagenaar, Zobel, Williams, & Hingson, 2000). A more recent study of

the long-term effects of license suspension policies across the US found that ALR reduces alcohol-related fatal crash involvement by five percent and saves approximately 800 lives each year (Wagenaar & Maldonado-Molina, 2007). Driving while impaired already increases risk of accident and injury, and ALR and ALS laws can decrease the number of impaired drivers on US roadways, which can greatly reduce risks for the average driver.

Goodwin et al. note that designing and implementing changes to these policy initiatives can take a moderate amount of time (2015). Additionally, high costs can be associated with the creation of these programs, but Indiana already has some forms of these initiatives in place. Some States have used offender fees to recover ALR or ALS system costs (Century Council, 2008; NHTSA, 2008a).

Publicized sobriety checkpoints – 5 star rating

Sobriety checkpoints are an effective means of deterrence for impaired drivers. Law enforcement officers establish checkpoints at predetermined locations to identify and apprehend impaired drivers. These initiatives rely on coordinated public awareness campaigns to increase perceived risk of arrest. Joint initiatives with public awareness campaigns reduce driver impairment rates. A study of demonstration programs in seven States showed reductions in alcohol-related fatalities between 11 percent and 20 percent in States that used numerous checkpoints or other highly visible impaired driving enforcement operations along with intensive publicity of the enforcement activities, such as paid advertising (Fell, Langston, Lacey, & Tippetts, 2008). The Centers for Disease Control (CDC) systematically reviewed 15 high-quality studies and found that checkpoints result in a nine percent reduction of alcohol-related fatal crashes (CDC, 2012). Similarly, a meta-analysis revealed that checkpoints lower alcohol-related crashes by 17 percent and all crashes by 10 to 15 percent (Erke, Goldenbeld, & Vaa, 2009). Additionally, these programs also allow officers to identify drivers without valid driver's licenses and those in possession of stolen vehicles, detection of improper seat belt use, outstanding warrants, and other traffic and criminal infractions.

Numerous resources provide comprehensive guidelines for the implementation of sobriety checkpoints. Fell, Lacey, and Voas (2004) offer an overview of checkpoint operations, use, effectiveness, and issues. Fell, McKnight, and Auld-Owens (2013) provide a detailed description of six highly visible enforcement programs in the United States, covering enforcement strategies, visibility elements, media use, funding, and other issues. Other resources include NHTSA's Strategic Evaluation States initiative (NHTSA, 2007a; Syner et al., 2008), the *Checkpoint Strikeforce* program (Lacey et al., 2008), and the national Labor Day holiday campaign: *Drunk Driving. Over the Limit. Under Arrest* (Solomon et al., 2008). Additionally, NHTSA's guidebook can assist law enforcement agencies in planning, operating and evaluating sobriety checkpoints with lower staffing requirements (NHTSA, 2006b).

The size and strategy of sobriety checkpoints can vary greatly. These programs rely heavily on the amount of funding dedicated to the initiatives. A typical checkpoint employing 15 or more officers can cost \$5,000 to \$7,000 (Robertson & Holmes, 2011). However, it is possible to reduce law enforcement costs by running checkpoints with teams of three to five officers (NHTSA, 2002; NHTSA, 2006b; Stuster & Blowers, 1995). Law enforcement agencies in two rural West Virginia counties maintained a year-long program of weekly reduced-staff checkpoints. The proportion



of nighttime drivers with BACs of .05 g/dL and higher was 70 percent lower in these counties, compared to drivers in counties without additional checkpoints (Lacey, Ferguson, Kelley-Baker, & Rider, 2006). These smaller checkpoints can operate for as little as \$500 to \$1,500 (Maistros, Schneider, & Beverly, 2014). Publicity is key facet of sobriety checkpoints. Using paid media adds to the cost of the checkpoints. Paid media budgets for the *Checkpoint Strikeforce* program ranged from \$25,000 in West Virginia to \$433,000 in Maryland (Fell et al., 2013). Adjusting initiatives to fit state needs and limitations can improve results.



High-visibility saturation patrols – 4 star rating

High-visibility saturation patrols use coordinated law enforcement techniques for targeted patrolling operations. These patrols are intended to identify and apprehend impaired drivers. Saturation patrols can vary in size, but have been found to be effective. In Minnesota, law enforcement officers conducted 290 saturation patrols in 2006, stopping 33,923 vehicles and arresting 2,796 impaired drivers (Century Council, 2008). These patrols can be an effective means of deterrence, especially when combined with large-scale publicity campaigns. Some researchers find paid media necessary to complement news stories and other earned media, particularly in an ongoing saturation patrol program (NCHRP, 2005, Strategy B1). Overall effectiveness relies heavily on the extent of publicity. NHTSA has published a “how-to” guide for planning and publicizing saturation patrols and sobriety checkpoints (NHTSA, 2002). Goodwin et al. note that “saturation patrols can be implemented within three months if officers are trained in detecting impaired drivers and in SFST” (Standardized Field Sobriety Test) (2015, p. 1-24). Costs may vary depending on levels of officer training and extent of program publicity.

Preliminary Breath Test devices (PBTs) – 4 star rating

A preliminary breath test (PBT) device can be used to measure BAC. The device indicates the relative BAC level. Simpson and Robertson (2001) conducted a survey of officers and found an estimated three-fourths of all DWI arrests occur during routine patrols. Implementing PBTs can be an effective law enforcement tool, particularly in cases where drivers appear to perform normally on many tasks. Two classes of drivers fall in this category: those with high alcohol tolerance (Simpson & Robertson, 2001) and under-21 drivers potentially in violation of zero-tolerance laws (Ferguson et al., 2000). Additionally, these devices are helpful crash at scenes where a driver’s injuries inhibit completion of a Standardized Field Sobriety Test (SFST). PBT use may increase DWI arrests and reduce

alcohol-involved fatal crashes (Century Council, 2008). Using PBTs can generate a greater perceived risk of being caught, since detection is easier to achieve, which may greatly deter impaired driving. Implementing PBTs can come at a moderate cost. Each device can range in price from \$200 to \$600. Additionally, PBT devices must be regularly serviced, and require routine maintenance. For a “Conforming Products List” of alcohol testing and screening instruments, including PBTs, see www.gpo.gov/fdsys/pkg/FR-2012-06-14/pdf/2012-14581.pdf.

Passive alcohol sensors – 4 star rating

Passive alcohol sensors (PAS) can detect the presence of alcohol in ambient air. These sensors are typically small and inconspicuous. They can be mounted on a flashlight or clipboard. Results show passive alcohol sensors are an effective tool, but officers must be in close proximity to a driver to obtain an accurate measure of the alcohol presence in the air. According to a number of studies, officers using PAS at checkpoints can detect 50 percent more drivers at BACs of .10 and above, than officers not equipped with PAS (Century Council, 2008; Farmer, Wells, Ferguson, & Voas, 1999; Fell et al., 2004; Voas, 2008). PAS appear to be particularly effective in assisting officers who rarely make arrests for DWI (Fell, Compton, & Voas, 2008). Training officers to use passive alcohol sensors properly facilitates more effective device implementation. Costs associated with PAS are similar to those of PBTs. Each unit generally costs between \$300- and \$700. Once purchased and distributed, training on device usage can be accomplished relatively quickly.

DWI courts – 4 star rating

DWI Courts are a specialized court system focused on prosecuting and rehabilitating impaired drivers. Compared to traditional processes, DWI Courts are established to incorporate more focused and improved strategies that are tailored for impaired drivers. One survey indicated that roughly half of prosecutors and judges poorly rated the training and education received prior to assuming their position, noting that their training inadequately prepared them to prosecute and preside over DWI cases (Robertson & Simpson, 2002). To combat this, DWI Courts are comprised of specialists, all experienced and trained in DWI cases. DWI Courts follow the model of roughly 2,500 drug courts around the nation (Huddleston, Marlowe, & Casebolt, 2008; NADCP, 2009; NCHRP, 2005, Strategy D3). Brunson and Knighten (2005), in Practice #1, offer a comprehensive overview of DWI Courts. To assist those implementing such initiatives, NHTSA has created a manual for new Traffic Safety Resource



Prosecutors (NHTSA, 2007b) and guidelines for enacting State Judicial Outreach Liaisons (NHTSA, 2013a).

Over one-half of US states, including Indiana, have implemented DWI-focused courts. A meta-analysis of 28 studies found that DWI Courts reduce DWI offenders' recidivism by an estimated 50 percent compared to traditional court programs (Mitchell, Wilson, Eggers, & MacKenzie, 2012). Additionally, DWI recidivism rates have been found to be low for DWI Court graduates in Athens (Georgia), Maricopa County (Arizona), Los Angeles County (California), and elsewhere (Marlowe et al., 2009). In Michigan, DWI court participants were 19 times less likely to be rearrested for DWI within two years than a comparison group of offenders in traditional probation (Michigan Supreme Court & NPC Research, 2008). Similarly, a study of three DWI Courts in Georgia revealed that offenders graduating from the court program showed a nine percent recidivism rate within the next 4 years, compared to a 24 percent recidivism rate for a comparison group of offenders processed in traditional courts (Fell, Tippetts, & Langston, 2011).

These programs require additional funding to cover costs of operation and training of staff specialists. However, a corresponding reduction in total time offenders spend in jail saves the justice system time and money (Michigan Supreme Court & NPC Research, 2008). Furthermore, DWI Courts may reduce long-term system costs substantially through projected declines in DWI recidivism. One estimate provides taxpayers a savings of up to \$3.36 for every dollar invested in drug courts (NADCP, 2009). These courts can be implemented rather quickly once staff training is sufficient.



Limits on diversion and plea agreements – 4 star rating

Diversion programs and plea agreements reduce and eliminate penalties associated with alcohol offenses. Completion of diversion programs, where offenders can complete alcohol education and treatment plans, can eliminate offenses from offender records. Additionally, a survey of prosecutors noted that 67 percent of defendants who pled guilty negotiated a plea agreement resulting in a reduced penalty (Robertson & Simpson, 2002a). Effective sanctions rely on the retention of an alcohol-related offense on the offender's record (Hedlund & McCartt, 2002; NCHRP, 2005; NTSB, 2000; Robertson & Simpson, 2002a). Offenders who recidivate receive less severe penalties with the original charge purged from their record. Researchers have found substantial evidence that diversion programs allow repeat offenders to avoid being identified,

since prior offenses are eliminated from their record (Hedlund & McCartt, 2002). Goodwin et al. note that costs remain low for eliminating/limiting diversion programs and plea agreement policies. These initiatives can be implemented rather quickly, depending on time to enact legislation and amend policies and procedures (2015).

Alcohol problem assessment, treatment – 5 star rating

Alcohol assessments can be useful to identify proper treatment methods by assessing drinking patterns and harmful behaviors. Proper treatment can create success. Alcohol assessment and treatment create an opportunity to address other problems contributing to problems with alcohol. One study showed that more than 60 percent of DWI repeat offenders experienced additional psychiatric disorders. These can range from post-traumatic stress disorder to anxiety disorders to bipolar disorder (Shaffer et al., 2007). Addressing issues that may be related to alcohol dependency can aid offenders through their rehabilitation. Wells-Parker, Bangert-Drowns, McMillan, and Williams (1995) surveyed studies assessing treatment effectiveness. They found that treatment reduced DWI recidivism and alcohol-related crashes by seven to nine percent, on average. Treatment appears to be most effective in combination with other sanctions and close monitoring of offenders to ensure both treatment and sanction requirements are met (Century Council, 2008; Dill & Wells-Parker, 2006).

Identifying treatment methods with effective alcohol assessments can help incorporate more beneficial options. NHTSA and the American Probation and Parole Association cooperated in developing a screening tool, the Impaired Driving Assessment (IDA). This tool can determine an offender's risk of recidivism and the most appropriate and effective community supervision program to reduce that risk (APPA, 2014). This is a national tool for uniform assessment measures, but these assessments may be individualized. Brief overviews of alcohol assessment and treatment programs and further references can be found at Century Council (2008), Dill and Wells-Parker (2006), Voas and Lacey (2011), NCHRP (2005, Strategy C4), and Robertson, Simpson, and Parsons (2008).

Alcohol ignition interlocks – 5 star rating

Alcohol ignition interlock systems are drunk driving deterrence tools. These devices require drivers to perform a breath test to start the vehicle. If a driver is impaired, the device will prevent them from being able to start the vehicle. A survey of 15 studies on the effectiveness of this type of device found that offenders with interlocks installed in their vehicles had recidivism rates that were 75 percent lower than drivers without interlocks in their vehicles (Elder et al., 2011). Marques and Voas (2010) offer an overview of interlock use, effectiveness, operational considerations, and issues around program management. Marques (2005), Beirness and Robertson (2005), and Robertson, Vanlaar, and Beirness (2006) summarize interlock programs both in the US and other countries, discussing typical problems and solutions. Further information is available from Brunson and Knighten (2005), Practice #5, NCHRP (2003, Strategy C2), and proceedings from the 11th Annual International Alcohol Interlock Symposium (Robertson, Holmes, & Vanlaar, 2011). Additionally, an ignition interlock toolkit is available from NHTSA to assist policymakers, highway safety professionals, and advocates (Mayer, 2014). NHTSA has also created model guidelines to assist States in developing and implementing highly effective interlock programs based on best practices in the US and other countries (NHTSA, 2013b).



Currently, Indiana does not mandate the implementation of alcohol ignition interlocks after a DWI or DUI offense. Although Indiana does not mandate use, the state does employ the device as a sanction for offenses. Pilot programs in Indiana and New Mexico demonstrated that approximately two-thirds of offenders chose interlocks over house arrest with electronic monitoring (Marques et al., 2010; Voas, Blackman, Tippetts, & Marques, 2001). Additionally, these tools can be used in combination with other sanctions. Using alcohol ignition interlocks as a prerequisite for reinstatement of licensure can increase driver compliance. One study found that among DWI offenders in Florida subject to the state's interlock requirement, a large majority (93 percent) complied with interlock installation once they qualified for reinstatement (Voas, Tippetts, Fisher, & Grosz, 2010).

Compliance with these devices relies heavily on outside factors as well. A study showed that offenders who were closely monitored, had fewer initial breath test failures and other indicators of noncompliance than offenders who received standard monitoring through the state licensing office (Zador, Ahlin, Rauch, Howard, & Duncan, 2011). Similarly, an in-depth study of three state interlock programs found non-compliance was highest in the state with less consistent monitoring practices (California) than in the two states with stronger monitoring practices (Florida and Texas) (Vanlaar et al., 2013). When alcohol ignition interlocks are implemented in conjunction with intensive monitoring, they are generally much more effective at reducing repeat offending.

Increasing use of alcohol ignition interlocks can reduce repeat offending as well as serve as a layered approach to deterrence. Mandating the use of alcohol ignition interlocks for offenders can be effective in ensuring compliance with imposed sanctions. However, implementing such measures can take time. Additional research is required to determine the extent of costs for a mandated requirement for offenders.

Vehicle and license plate sanctions – 4 star rating

Vehicle and license plate sanctions are another effective way to reduce repeat offending. An overview of vehicle and license plate sanctions is offered by NHTSA (2008b), DeYoung (2013), and Voas, Fell, McKnight, and Sweedler (2004). Further resources are available from Brunson and Knighten (2005), Practice #4, and NCHRP (2003), Strategies B1, B2, and C1. These sanctions range from license suspension, license plate impoundment, vehicle impoundment, vehicle immobilization, and vehicle forfeiture. Studies have found that these sanctions work well in conjunction with traditional court proceedings.

These methods tend to be an effective means of deterrence for offenders who may repeatedly offend. In Minnesota, recidivism and driving with a suspended license declined with license plate impoundment administered by arresting officers, in particular among the youngest offenders (Leaf & Preusser, 2011; Rogers, 1995). Plate impoundment does not involve the courts, and can occur quickly, consistently, and efficiently (NCHRP, 2003, Strategy B2; NHTSA, 2008e; NTSB, 2000). The implementation of these strategies depends largely on state law, but officer discretion plays an integral part in their use. Compared to impoundment or forfeiture, the cost of immobilization is minimal (NCHRP, 2003, Strategy C1; NTSB, 2000). An assessment of California's impoundment law revealed that both first-time and repeat offenders whose vehicles were impounded had fewer subsequent arrests for driving with a suspended license and fewer crashes (DeYoung, 1997). In addition to reductions in repeat offending, vehicle impoundments and forfeitures can gen-

erate revenue for arresting agencies. However, the strategy can also be costly, with storage fees up to \$20 per day; and owners often abandon low-value vehicles rather than pay the storage costs (NCHRP, 2003, Strategy C1; NTSB, 2000). Once forfeited, vehicles can be allocated to agencies, or auctioned for revenue.

DWI offender monitoring - 4 star rating

Recidivism rates can be reduced through the use of intensive monitoring programs as opposed to automatic incarceration for DWI offenders. Offenders can be monitored and provided with services through probation, electronic monitoring, and dedicated detention. In South Dakota, a 24/7 Sobriety Program has created reductions in recidivism of up to 74 percent among participants compared to controls (Kilmer, Nicosia, Heaton, & Midgette, 2013; Loudenburg, Drube, & Leonardson, 2010). An intensive supervision program in Oregon reduced recidivism by half (Lapham, Kapitula, C'de Baca, & McMillan, 2006); an electronic monitoring program in Los Angeles County, California showed a reduction of one-third (Brunson & Knighten, 2005; Jones, Wiliszowski, & Lacey, 1996). In Baltimore County, a dedicated detention facility had a 4 percent recidivism rate one year after program completion, compared to a recidivism rate of 35 percent for offenders not in the program (Century Council, 2008). NHTSA provides guidelines for community supervision of DWI offenders (Dunlap, Mullins, & Stein, 2008). Benefits of these initiatives vary depending on the extent and quality of implementation.

These processes are already in place to some extent in Indiana. In 2003, Indiana began using Secure Continuous Remote Alcohol Monitoring (SCRAM) devices to monitor offenders for unacceptable alcohol use. Nationwide, in 2011, approximately 50,000 offenders were being monitored with SCRAM devices, and approximately two-thirds of them were DWI offenders (Fell & McKnight, 2013). Intensive monitoring, especially electronic monitoring systems, can be cost-effective means of punishment and treatment. Participants in 24/7 programs must pay roughly \$4 per day for breath testing, and electronic monitoring fees generally range from \$5 to \$10 per day (Fell & McKnight, 2013).

Lower BAC limit for repeat offenders – 4 star rating

Lowering BAC limits for repeat offenders can reduce recidivism rates. This decrease can be attributed to the fact that lowering limits increases consequences of being caught driving impaired. Currently all states mandate a BAC limit of .08 for all drivers over the age of 21, while underage drivers are mandated a limit of .02. Some states have more stringent BAC



limits for first-time offenders, but this is more common as a sanction for repeat offenders. Five States lowered the BAC limit for DWI offenders as of 2001, to underscore that they should not be driving after drinking even moderate amounts (Jones & Rodriguez-Iglesias, 2004).

Reducing the number of impaired drivers on US roadways can decrease accidents and fatalities alike. In addition to US studies, evaluations conducted in other countries suggest that lower BAC limits cut the number of alcohol-impaired crashes (NHTSA, 2003). For example, British Columbia, Canada, introduced a law in 2010 that mandated an administrative 3-day license suspension and possible vehicle impoundment for drivers with BAC levels between .05 and .08. The law's goal was to maximize deterrence by increasing the certainty and swiftness of repercussions. In the year after the law took effect, British Columbia saw a 40 percent decrease in alcohol-related fatal crashes (Macdonald et al., 2013). Further, roadside surveys showed a 44 percent decrease in drivers with BACs of .05 or higher, and a 59 percent decrease in drivers with BACs over .08 (Beirness & Beasley, 2014). Decreased limits increase deterrence effects, since lower limits are easier to surpass for someone who has consumed alcohol recently. Overall these strategies can be implemented relatively quickly and at little cost.

Alcohol screening and brief intervention – 5 star rating

Alcohol screening employs a few questions to estimate the level and severity of alcohol use and to determine whether a person is at risk of alcohol misuse or dependence (SAMHSA, 2007). Brief interventions focus on creating awareness of the problem and motivating individuals toward behavior change (SAMHSA, 2015). Using these initiatives in conjunction can produce positive results. Alcohol screening and brief interventions in medical facilities have been shown to reduce drinking and self-reported driving after drinking (D'Onofrio & Degutis, 2002; Moyer, Finney, Swearingen, & Vergun, 2002; Wilk, Jensen, & Havighurst, 1997). Dill et al. (2004) reviewed nine studies that assessed the impact of alcohol screening and brief intervention on injury. They found that alcohol screening and brief interventions lowered rates of both drinking and alcohol-related traffic collisions and injuries. Reductions in these areas not only encourage public safety, but help individuals overcome dependence.

Numerous sources offer information regarding the planning and implementation of alcohol assessments and brief intervention methods. Procedures for alcohol screening and brief interventions can be obtained from the American Public Health Association (APHA) (Guard & Rosenblum, 2008), the American College of Emergency Physicians

(ACEP, 2006), and the National Institute on Alcohol Abuse and Alcoholism (NIAAA, 2005); these can be implemented as soon as staff is identified and trained. Further, NHTSA and the APHA have created an alcohol and brief intervention guide for public health practitioners (Guard & Rosenblum, 2008). NHTSA offers a toolkit for conducting screenings and brief interventions on college campuses (Quinn-Zoback, 2007).

Implementing alcohol assessments and brief intervention practices can be accomplished relatively quickly depending current levels of training for specialty staff. Roughly half of trauma centers routinely screen patients for alcohol problems; about a third use some form of brief intervention (NCHRP, 2005, Strategy A4; Schermer et al., 2003). These methods are also employed on college campuses and in primary care medical facilities and social service settings (NCHRP, 2005, Strategy A4). Widespread use of these methods can be very beneficial, but they require properly trained staff, which can come at a cost. However, several studies show that such intervention is cost-effective, substantially reducing future healthcare costs, such as hospital and emergency room visits (Guard & Rosenblum, 2008)."

Minimum drinking age 21 laws – 5 star rating

Imposing minimum legal drinking age (MLDA) restrictions can reduce underage drinking and alcohol related traffic accidents. Since 1984, the minimum legal drinking age has been 21 in all States. MLDA-21 laws have been strongly linked to reductions in drinking, driving after drinking, and alcohol-related crashes and injuries among youth (Hingson et al., 2004; McCartt, Hellinga, & Kirley, 2010; Shults et al., 2001; Wagenaar & Toomey, 2002). These reductions directly correlate with MLDA.

Although the US is one of only a select few countries that implement MLDA restrictions over the age of 19, these restrictions can be effective. Shults et al. (2001) found 33 published studies on the effects of changing the legal drinking age. Their survey revealed that changes to the MLDA affected alcohol-related crashes by 10 percent to 16 percent; crashes decreased when the MLDA was raised and increased when it was lowered. Wagenaar and Toomey (2002) reviewed 79 high-quality studies concerning the relationship between the MLDA and crashes. Among the studies examined, 58 percent found fewer crashes associated with a higher MLDA, and none found fewer crashes associated with a lower MLDA. According to NHTSA estimates, MLDA-21 laws saved 28,230 lives since 1975, and roughly 550 lives in 2010 alone (NHTSA, 2012). These relationships expose the necessity of MLDA-21 restrictions.



RESOURCES

Additional information regarding impaired driving can be found at the following agencies and organizations:

- Behavioral Safety Research Reports—ntlsearch.bts.gov/repository/ntlc/nhtsa/index.shtm
- Centers for Disease Control and Prevention—www.cdc.gov/MotorVehicleSafety/Impaired_Driving/impaired-drv_factsheet.html
- Office of National Drug Control Policy—www.whitehouse.gov/ondcp/drugged-driving
- American Automobile Association—<http://duijusticelink.aaa.com/for-the-public>
- Governors Highway Safety Association: www.ghsa.org/html/issues/impairessedriving/index.html
- Insurance Institute for Highway Safety—www.iihs.org/iihs/topics/t/alcohol-impairessedriving/topicoverview
- Mothers Against Drunk Driving—www.madd.org
- National Safety Council—www.nsc.org/safety_road/DriverSafety/Pages/ImpairedDriving.aspx
- Traffic Injury Research Foundation—www.tirf.ca

NHTSA resources

- Impaired Driving—www.nhtsa.gov/Impaired
- Impaired Driving (Alcohol-Related) Reports— [www.nhtsa.gov/Driving+Safety/Research+&+Evaluation/Impaired+driving+\(alcohol-related\)+reports](http://www.nhtsa.gov/Driving+Safety/Research+&+Evaluation/Impaired+driving+(alcohol-related)+reports)
- Impaired Driving (Drug-Related) Reports— [www.nhtsa.gov/Driving+Safety/Research+&+Evaluation/Impaired+driving+\(drugrelated\)+reports](http://www.nhtsa.gov/Driving+Safety/Research+&+Evaluation/Impaired+driving+(drugrelated)+reports)

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Occupant protection



OVERVIEW

Indiana’s observational rate of restraint use among passenger vehicle occupants has increased from 84 percent in 2006 to 92 percent in 2015, 3 percentage points higher than the reported 2015 national rate. Observed helmet use among motorcyclists in Indiana, which is not legally mandated by the state, consistently lagged far behind the national rate between 2006 and 2015. In 2015, 37 percent of motorcyclists in Indiana were wearing helmets, compared to 61 percent nationally in 2015 (Figure 3.1) (Sapp, 2016)

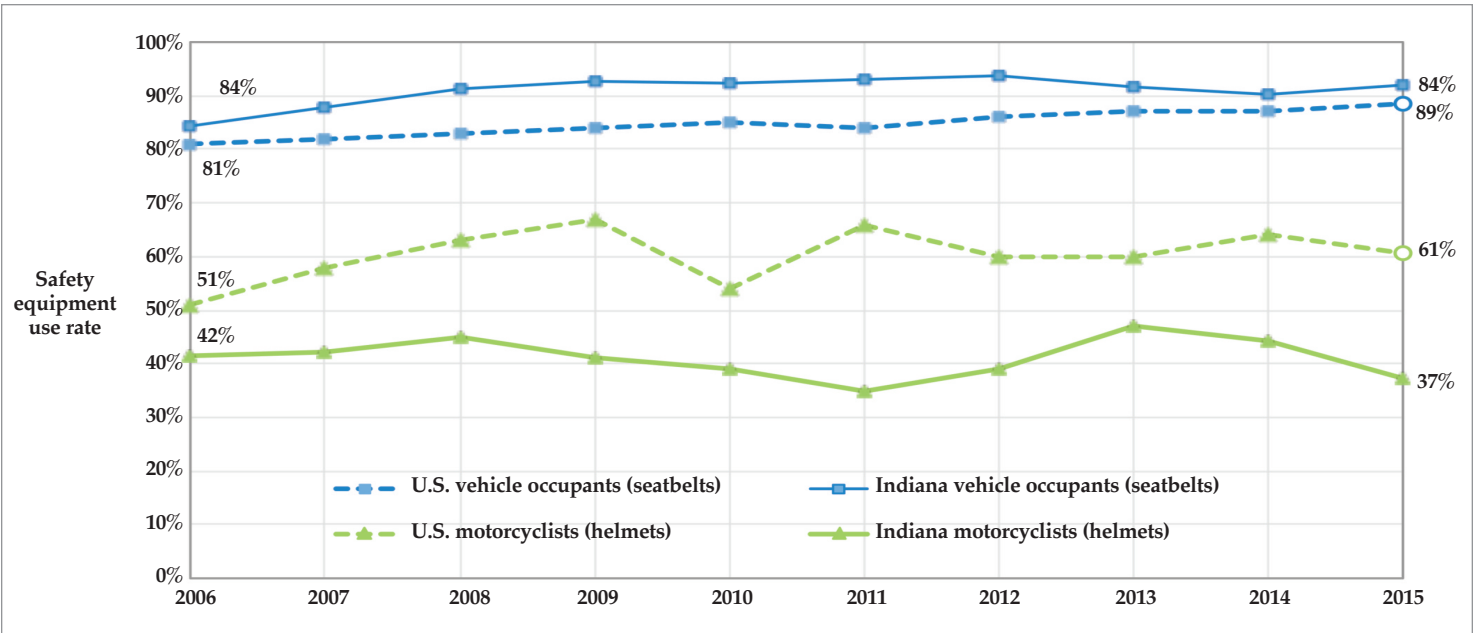
Among the 574 passenger vehicle occupants killed in Indiana collisions, 48 percent were properly restrained (Figure 3.2). According to NHTSA, in the US 49 percent of passenger vehicle occupants who were killed in 2014 (latest data available) were unrestrained (NHTSA, DOT HS 812 262, 2016).

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. 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. 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 or exceeds height and weight requirements specified by the car seat manufacturer. These guidelines also include the use of booster safety seats until age 8 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.

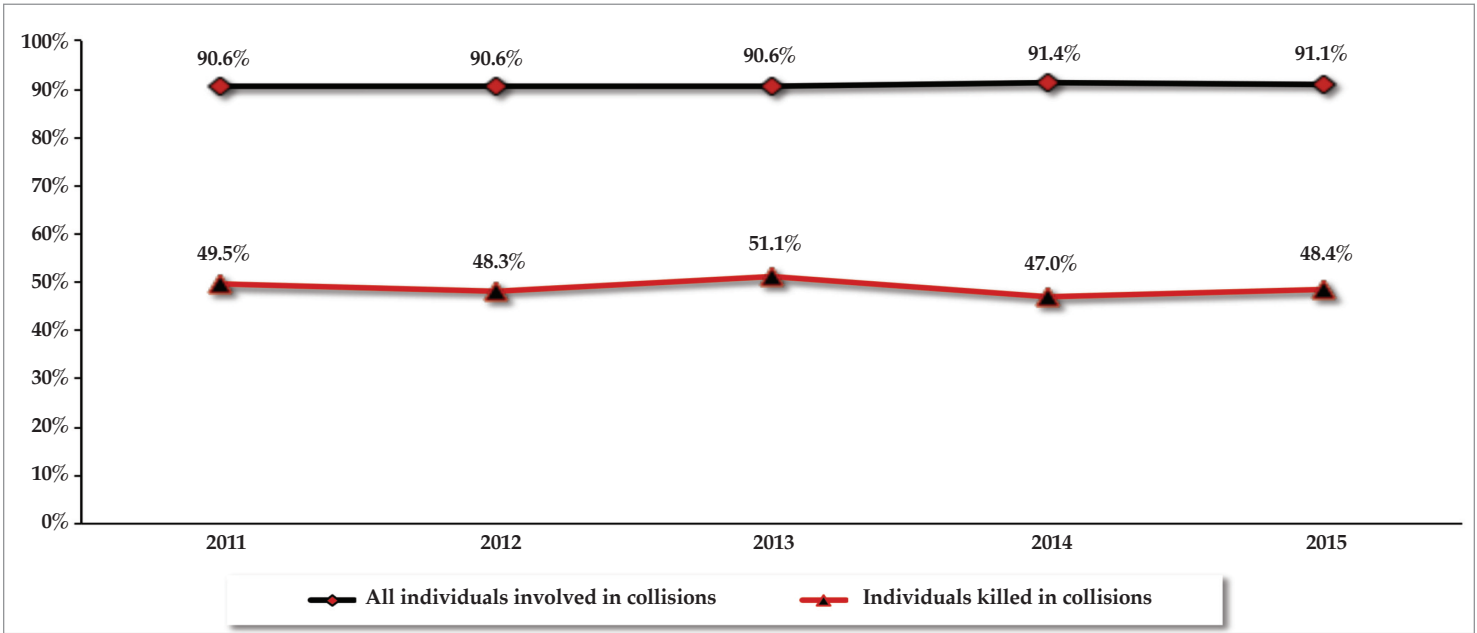
Sources: IC 9-19-10-2, IC 9-19-10-2; available at <http://www.ai.org/legislative/ic/code/title9/ar19/ch10.html>

Figure 3.1. Comparison of observed safety equipment usage rates by vehicle type, 2006-2015



Sources:
Seat Belt Use in 2015 - Use Rates in the States and Territories. National Highway Traffic Safety Administration: DOT HS 812 243
Motorcycle Helmet Use in 2015—Overall Results. National Highway Traffic Safety Administration: DOT HS 812 275
Indiana Safety Belt Observational Survey, June 2015, Survey Results. Center for Road Safety, Purdue University

Figure 3.2. Seatbelt use among passenger vehicle occupants involved in Indiana collisions, by injury status, 2011-2015

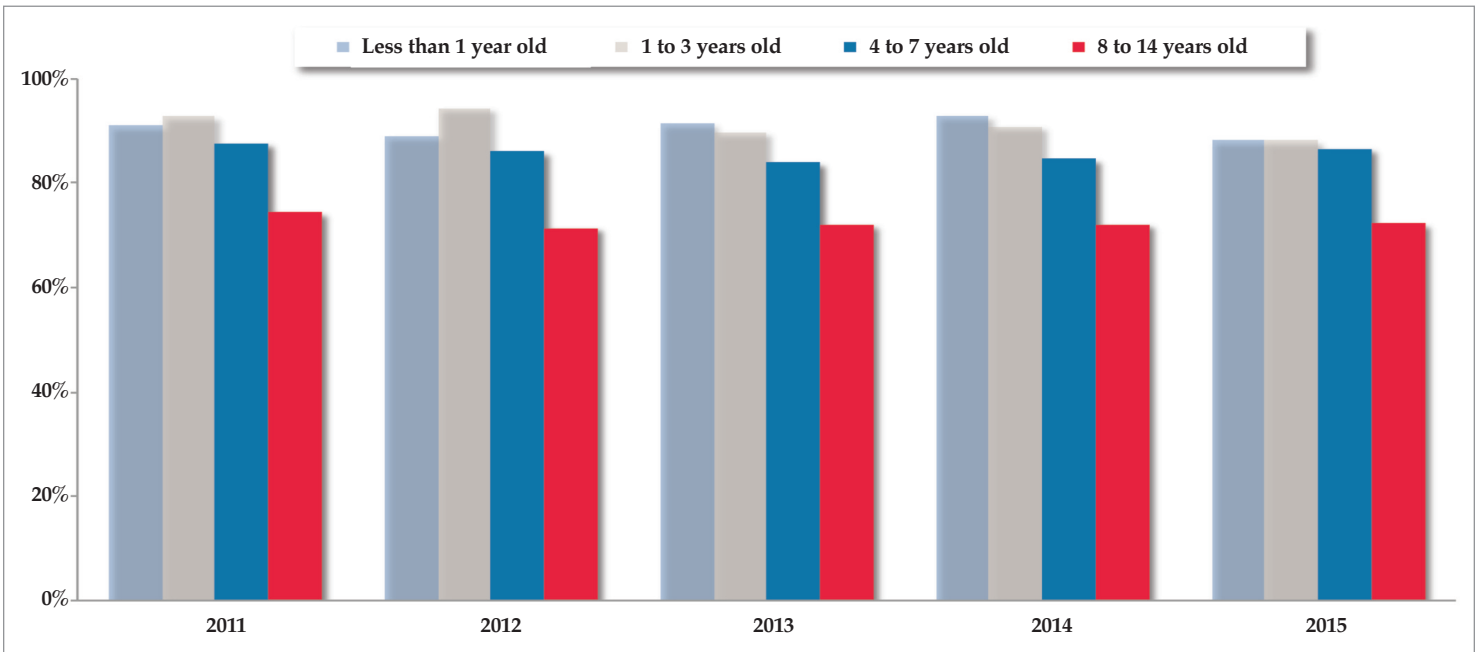


Source: Indiana State Police Automated Reporting Information Exchange System, as of March 17, 2016

Restraint use rates among children in traffic collisions tend to decline as children get older (Figure 3.3). In 2015, the 8- to 14-year-old age group had the lowest rate of restraint use (75 percent). Between 2011 and 2015, this age group exhibited rates of restraint use consistently at or lower

than 75 percent. The highest rate of restraint use over the five-year period was 94 percent among children 1- to 3-year-old in 2011; the rate of restraint use among children in this age group fell to 88 percent in 2014.

Figure 3.3. Restraint use among children involved in Indiana traffic collisions, by age group, 2011-2015



Source: Indiana State Police Automated Reporting Information Exchange System, as of March 17, 2016

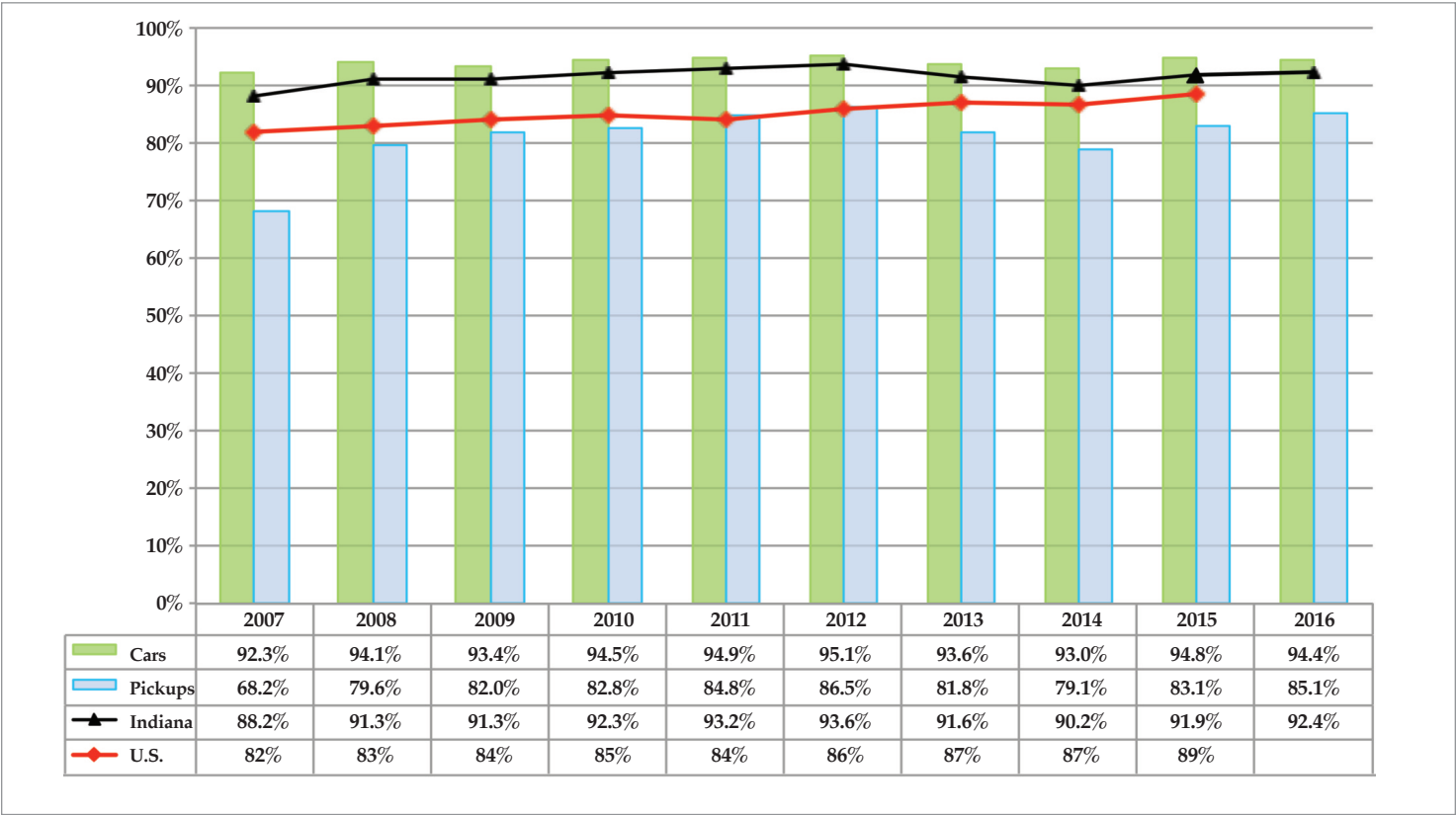
- Notes:
- 1) Restraint use rates are calculated based on individuals identified as *injured occupant* or *driver* where restraint use was known.
 - 2) *Unrestrained* and *unknown* restraint use codes are included in totals for restraint use rate calculations.



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 2007. The overall Indiana observed seatbelt use rate in passenger vehicles in 2016 was 92.4 percent, up

slightly from 2015 (Figure 3.4). Indiana restraint usage rates for all passenger vehicle occupants increased 4 percentage points since 2007. Observed seatbelt use among Indiana pickup truck occupants in 2016 (85.1 percent) was the highest observed rate since 2013.

Figure 3.4. Observed Indiana and U.S. seat belt use rates in passenger vehicles, 2007 to 2016



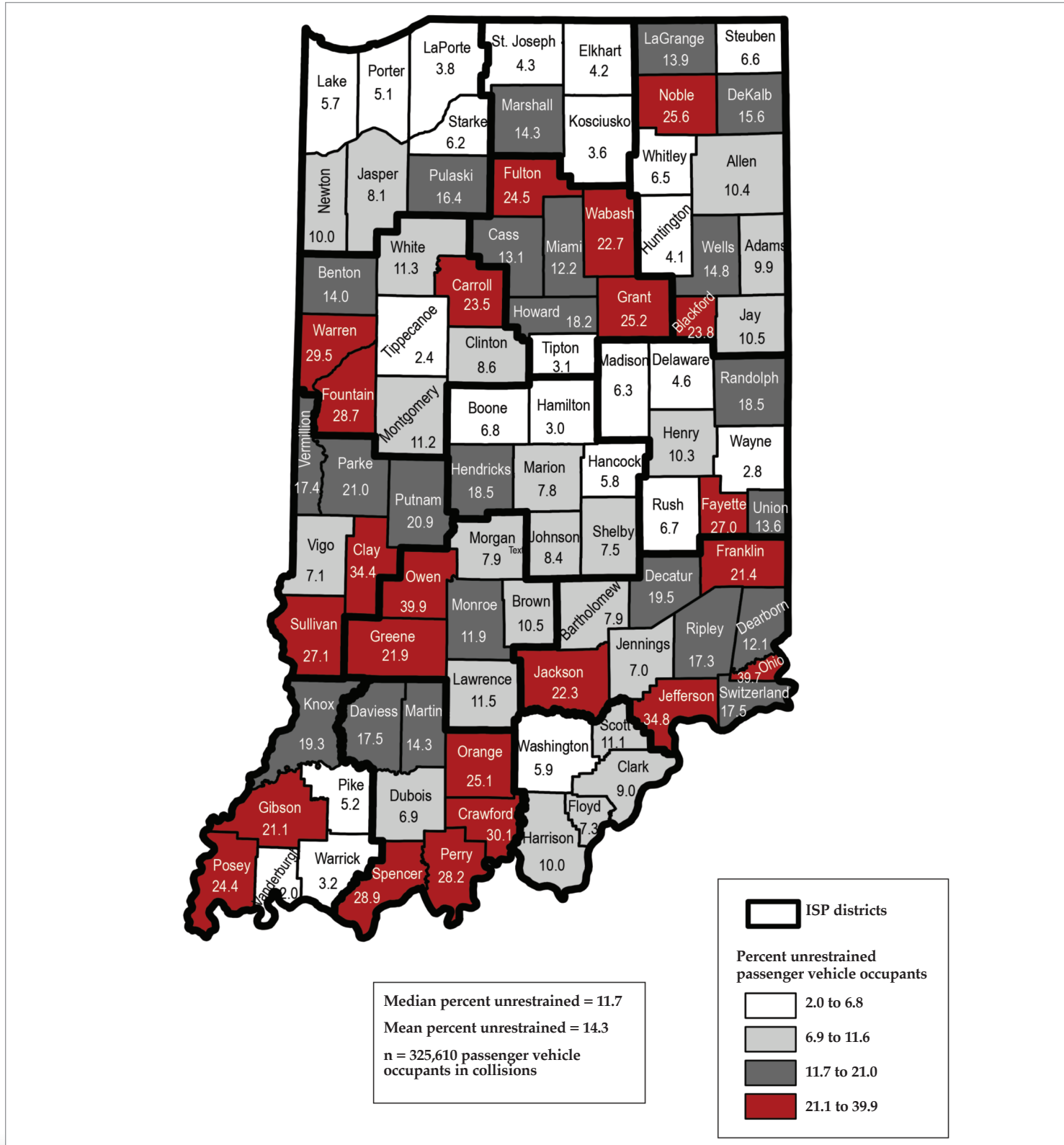
Sources:
Indiana - *Indiana Roadside Observational Survey of Safety Belt and Motorcycle Helmet Use*, Center for Road Safety, Purdue University, 2016
U.S. - DOT HS 812 243, February 2016

- Notes:
- 1) Indiana data (2007-2010) represent the average annual rates of observed restraint use among all Indiana passenger vehicle occupants in a study previously conducted by ICJI twice per year. Beginning in 2011, this study was conducted only once each year; therefore, averages no longer apply from this point forward.
 - 2) Car and pickup truck restraint usage rates are specific to Indiana only.
 - 3) 2015 most recent year available for U.S. data.

As shown in Map 4, the median county percent of unrestrained individuals involved in collisions was 2.9. In 2015, Spencer (20.4), Daviess (8.0), Sullivan (7.5), and Pike (7.1) counties, located in southwestern Indiana, had the highest rates of unrestrained vehicle occupants in collisions.

More generally, urban counties had the lowest percentages of unrestrained injuries, and southern Indiana counties had higher rates of unrestrained injuries than counties located in northern portions of the state.

Map 4. Percent of unrestrained passenger vehicle occupants in Indiana collisions by county and Indiana State Police district, 2015



Source: Indiana State Police Automated Reporting Information Exchange System, as of March 17, 2016



NHTSA RECOMMENDED STRATEGIES AND COUNTERMEASURES

The NHTSA publication, *Countermeasures that work: A highway safety countermeasure guide for State highway safety offices*, recommends a number of strategies for addressing occupant protection (Goodwin et al., 2015). Broadly, these include the following:

1. State Primary Enforcement Seat Belt Use Laws
2. Local Primary Enforcement Seat Belt Use Laws and Ordinances
3. Increased Belt Use Law Penalties: Fines and Driver's License Points
4. Short-Term, High Visibility Seat Belt Law Enforcement
5. Combined Nighttime Seat Belt and Alcohol Enforcement
6. Communications and Outreach Supporting Enforcement
7. Communications and Outreach Strategies for Low-Belt-Use Groups
8. Strengthening Child/Youth Occupant Restraint Laws
9. Short-Term High Visibility Child Restraint/Booster Law Enforcement

Nine specific countermeasures that NHTSA found to be effective are highlighted below. Each of the following received at least a:

- 4 star rating—demonstrated to be effective in certain situations, or
- 5 star rating—likely to be effective based on balance of evidence from high-quality evaluations or other sources.

State Primary Enforcement Seat Belt Use Laws – 5 star rating

Primary enforcement seat belt use laws allow officers to pull over and issue citations to offenders on the spot, whereas, secondary enforcement laws only allow officers to cite an offender that have been pulled over for other traffic violations. “Compared with secondary laws, primary laws were associated with a higher observed seat belt use (10 to 12% higher) and higher seat belt use among front-seat occupants killed in crashes (9% higher) (NHTSA, 2014b).” Increasing seat belt use can help to ensure occupant safety. “The Centers for Disease Control and Prevention’s systematic review of 13 high-quality studies (Shults, Nichols, Dinh-Zarr, Sleet, & Elder, 2004) found that primary laws increase belt use by about 14 percentage points and reduce occupant fatalities by about 8% compared to secondary laws.” Currently Indiana implements primary enforcement seat belt use laws for occupants up to age 16. Implementing primary enforcement seat belt use laws for all ages can improve occupant safety with even further reductions in injury and fatality rates.

Local Primary Enforcement Seat Belt Use Laws and Ordinances – 4 star rating

Local campaigns focused on implementing primary enforcement seat belt use laws can raise awareness and increase

compliance. “St. Louis County, Missouri, implemented a primary seat belt use ordinance in March 2007. Following implementation of this ordinance, the St. Louis County Police Department conducted an intense high visibility enforcement campaign, accompanied by publicity in the form of variable message boards and permanent road signs, along an 8-mile corridor on State Highway 21. Observational surveys were conducted along the Highway 21 corridor and a control site prior to the start of the enforcement and immediately after its conclusion. The observational surveys measured an increase in belt use from 83% to 88% along the Highway 21 corridor and a small, 59% to 57% decrease in belt use along the control corridor (Nichols, Solomon, Chaffe, & Preusser, 2010).” Focusing approaches towards hot spot areas can yield beneficial results. Implementing public awareness campaigns and increased enforcement in these areas can deter violators and improve overall safety. Since these efforts are localized they require lower costs and time less time to implement.

Increased Belt Use Law Penalties: Fines and Driver's License Points – 4 star rating

Increasing penalties for noncompliance of seat belt laws can be a beneficial means to increase occupant use. Violation of these laws typically result in small fines. Fines in Indiana are usually in the amount of \$25. Increasing fines and other penalties can influence compliance. “As of March 2009, 3 jurisdictions, the District of Columbia, Georgia, and New Mexico, assessed driver license points for all seat belt law violations (Decina, Hall, & Lococo, 2010).” Awarding points to violators can lead to more detrimental penalties, such as suspension of license.

Increasing compliance can ensure safety for vehicle occupants. Although some prefer to ignore seat belt laws, the use of these devices is associated with a reduction in injuries and fatalities. “Nichols, Tippetts, et al. (2010 and 2014) examined the relationship between seat belt violation fine and belt use and found that increasing fines was associated with increased belt use.

Increasing a State’s fine from \$25 to \$60 was associated with an increase of 3% to 4% in both observed belt use and belt use among front-seat occupants killed in crashes. Similarly, increasing the fine from \$25 to



\$100 was associated with an increase of 6% to 7%." These policies can be implemented rather quickly at a relatively low cost. Reductions in seat belt law violators will yield less revenue, but increases in fines can counterbalance these losses.

Short-Term, High Visibility Seat Belt Law Enforcement – 5 star rating

Short term, high intensity seat belt law enforcement campaigns that are thoroughly publicized can bring about major improvements to occupant seat belt use. Implementing public outreach and awareness campaigns for these short term initiatives can facilitate greater and longer lasting impacts. "The May 2002 Click It or Ticket campaign evaluation demonstrated the effect of different media strategies. Belt use increased by 8.6 percentage points across 10 States that used paid advertising extensively in their campaigns. Belt use increased by 2.7 percentage points across 4 States that used limited paid advertising and increased by only 0.5 percentage points across 4 States that used no paid advertising (Solomon, Ulmer, & Preusser, 2002)." Public awareness campaigns in conjunction with short term, high intensity enforcement strategies can increase seat belt compliance and reduce risk for traffic accident injuries and fatalities.

Goodwin noted that these campaigns can take time to develop and initiate. Additionally, effective campaigns can rely on costly advertising initiatives. Of states implementing these initiatives "paid advertising costs were nearly \$350,000 for the 2007 campaign (Solomon, Preusser, et al., 2009). More recently, the 2012 *Click It or Ticket* campaign used extensive paid advertising (\$8 million nationally and \$12 million in individual States)."

Combined Nighttime Seat Belt and Alcohol Enforcement – 4 star rating

Seat belt compliance rates are typically lower at night. "According to FARS data for the 10-year period from 2004 to 2013, nighttime seat belt use was on average 18 percentage points lower than daytime belt use (FARS data). Conducting increased enforcement strategies throughout the night can generate positive results. "A 2004 nighttime high visibility belt enforcement program in Reading, Pennsylvania, increased nighttime front-seat-occupant belt use by 6 percentage points, from 50% to 56%. Daytime belt use increased by 3 percentage points, from 56% to 59% (Chaudhary et al., 2005)." This increase in seat belt use can lead to decreased numbers of injuries. Additionally, Studies "suggest that more emphasis on seat belt enforcement during the late-night hours and in conjunction with alcohol laws can provide additional gains in seat belt use and injury reduction (Nichols & Ledingham, 2008). Most importantly these initiatives can raise compliance rates during higher risk times of night.

Communications and Outreach Supporting Enforcement – 5 star rating

Public outreach and awareness initiatives are essential to increase seat belt use compliance. "Paid advertising can be a critical part of the media strategy. Paid advertising brings with it the ability to control message content, timing, placement, and repetition (Milano et al., 2004)." Implementing public outreach and awareness initiatives for these campaigns can facilitate greater and longer lasting impacts. "The May 2002 *Click It or Ticket* campaign evaluation demonstrated the effect of different media strategies. Belt use increased by 8.6 percentage points across 10 States that used paid advertising extensively in their campaigns. Belt use increased by 2.7 percentage points across 4 States that used limited paid

advertising and increased by only 0.5 percentage points across 4 States that used no paid advertising (Solomon, Ulmer, & Preusser, 2002)." Public awareness campaigns that incorporate community outreach with enforcement strategies can increase seat belt compliance and reduce risk for traffic accident injuries and fatalities.

Goodwin noted that these campaigns can take time to develop and initiate. Additionally, effective campaigns can rely on costly advertising initiatives. Of states implementing these initiatives "paid advertising costs were nearly \$350,000 for the 2007 campaign (Solomon, Preusser, et al., 2009)." In all actuality the cost can vary depending on the extent of the initiative.

Communications and Outreach Strategies for Low-Belt-Use Groups – 4 star rating

Targeting low-belt-use groups may create additional gains that traditional seat belt enforcement campaigns may neglect to achieve. Low-belt-use groups describes groups of people who are less likely to wear seat belt. "In 2012, belt use was 80% for occupants 16 to 24, 87% for occupants 8 to 15, 87% for occupants 25 to 69, and 88% for those occupants 70 and older (Pickrell, 2014). Since 2005, belt use rates for black occupants have been lower than use rates for members of other races. In 2012, belt use for black occupants was 77% compared to 86% among white occupants, and 92% among members of other races (Pickrell, 2014)." Additionally, males and rural drivers are less likely to wear seat belts than their counterparts.

Identifying low-belt-use groups and targeting awareness and enforcement strategies towards these groups can be effective at producing results. Campaigns can significantly increase seat belt use in these groups using "effective communications and outreach campaigns: good target audience research, effective and creative message development, and good message placement using both paid and earned media. The overall South Central Region campaign produced only modest gains, but Kentucky (67% to 76% statewide), Mississippi (58% to 65% in targeted counties), North Dakota (66% to 80% in targeted counties), and Wyoming (55% to 70% in targeted counties) were able to achieve significant increases in seat belt use through their programs (Blomberg, Thomas, & Cleven, 2009)." Increased outreach and enforcement aimed specifically at these low-belt-use groups can make breakthroughs that reduce their rates of noncompliance.

Strengthening Child/Youth Occupant Restraint Laws – 5 star rating

Currently Indiana requires children remain in a rear facing child safety seat until age 1 or the child is twenty pounds. Once children reach this restriction they can move to forward facing car seats. At thirty pounds children can move to booster seats until age 8. "Research conducted by Arbogast et al. (2009) found that transitioning children from child restraints with harnesses to belt-positioning booster seats instead of vehicle seat belts provides significant safety benefits for children at least through 8, and that belt-positioning booster seats lower the risk of injury to children in crashes by 45% compared to the use of vehicle seat belts alone." Recent recommendations by child passenger safety experts have developed 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 or exceeds height and weight requirements specified by the car seat manufacturer. It is also recommended that all children ride in the back seat of the vehicle until the age of 13.



Short-Term High Visibility Child Restraint/Booster Law Enforcement – 5 star rating

Ensuring drivers are compliant with child restraint/booster laws protects children who need enhanced safety restraints to guarantee adequate protection in an accident. Currently, “there is concern, however, that law enforcement officers are reluctant to enforce child restraint laws due to a lack of commitment by their departments and a lack of knowledge on the part of officers on the subject of child restraints (Decina, Lococo, Ashburn, Hall, & Rose, 2008; Decina, Temple, & Dorer, 1994; NHTSA, 1990). More recent research demonstrates that effective approaches for enforcing child restraint laws – in particular booster seat laws – are possible, but they depend on top management support and enforcement methods that are dedicated to booster seat and other child restraint laws (Decina, Hall, & Lococo, 2010).” Implementing these strategies can raise awareness for the necessity of such equipment.



Strategies to achieve higher rates of compliance for child restraint/booster seat use a variety of methods to achieve these results. Researchers find that “enforcement of child restraint/booster laws should be coupled with high visibility communications and outreach (Solomon et al., 2003). Paid advertising can be a critical part of the media strategy. Paid advertising brings with it the ability to control message content, timing, placement, and repetition (Milano et al., 2004).” Raising awareness to the issue is half the battle. Continued reinforcement of statutes

through awareness campaigns coupled with enhanced policy enforcement can be exceedingly effective. A “systematic review of evidence of effectiveness for child restraint interventions, Zaza et al. (2001) determined that community-wide information plus enhanced enforcement campaigns were effective in increasing child restraint use.” Increased child restraint use will essentially lead to reductions in child injury and fatality rates.

ADDITIONAL RESOURCES

Additional information regarding occupant protect, including seat belts and child passenger safety, can be found at the following agencies and organizations:

- Centers for Disease Control and Prevention, Injury Prevention & Control: Motor Vehicle Safety: www.cdc.gov/Motorvehiclesafety/index.html
- Behavioral Safety Research Reports - ntlsearch.bts.gov/repository/ntlc/nhtsa/index.shtm
- Governors Highway Safety Association: www.ghsa.org/html/issues/occp/occp/index.html
- Insurance Institute for Highway Safety:
 - Safety Belt Use - www.iihs.org/iihs/topics/t/safety-belts/topicoverview
 - Children - www.iihs.org/iihs/topics/t/child-safety/topicoverview
- National Safety Council: Seat Belts - www.nsc.org/safety_road/DriverSafety/Pages/SeatBelts.aspx
- Child Safety Seats & Boosters - www.nsc.org/safety_road/DriverSafety/Pages/ChildPassengerSafety.aspx
- AAA:
 - Seat Belts - <http://exchange.aaa.com/safety/roadway-safety/safety-belts/>
 - Child Passenger Safety - <http://exchange.aaa.com/safety/child-safety/>
 - AAA Foundation for Traffic Safety: www.aaafoundation.org

Child Passenger Safety

- American Academy of Pediatrics, Annual Car Seat information For Families guide: www.healthychildren.org/English/safety-prevention/on-the-go/Pages/Car-Safety-Seats-Information-for-Families.aspx
- Automotive Safety Program, Riley Hospital for Children: www.preventinjury.org
- Center for Injury Research and Prevention, The Children's Hospital of Philadelphia: www.research.chop.edu/programs/injury/
- Safe Ride News Publications: www.saferidenews.com
- Safety Belt Safe U.S.A.: www.carseat.org
- University of Michigan Transportation Research Institute: www.cpsbestpractice.org

NHTSA resources

- Occupant Protection - www.nhtsa.gov/Driving+Safety/Occupant+Protection
- Parents Central - www.safercar.gov/parents/index.htm
- Research and Evaluation - www.nhtsa.gov/Driving+Safety/Research+&+Evaluation

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INDIANA TRAFFIC SAFETY FACTS



Young Drivers



OVERVIEW

In 2015, collision involvement rates were higher among young drivers than any other age group (Figure 4.1). Drivers between 15 and 20 years of age had the highest rate of crash involvement (1,274 per 10,000 licensed) (Sapp, 2016). Young drivers, generally, are more likely than older drivers to be involved in collisions due to aggressive driving behavior and a lack of experience. In 2015, 52 drivers 15 to 20 years old were killed and another 4,705 were injured in traffic crashes in Indiana (Nunn, 2016). The number of young drivers (15 to 20 years old) killed in collisions increased from 34 in 2014 to 52 in 2015 (Figure 4.2).

In Indiana in 2015, 15 percent of all drivers involved in fatal crashes were young drivers. Nationally, in 2014, 9 percent of all drivers involved in fatal crashes were 15 to 20 years old. Young drivers accounted for 6 percent of the total number of licensed drivers in the United States in 2014. (NHTSA, 2016). In Indiana, young drivers accounted for 8 percent of all licensed drivers and 13 percent of drivers in collisions in 2015 (Nunn, 2016).

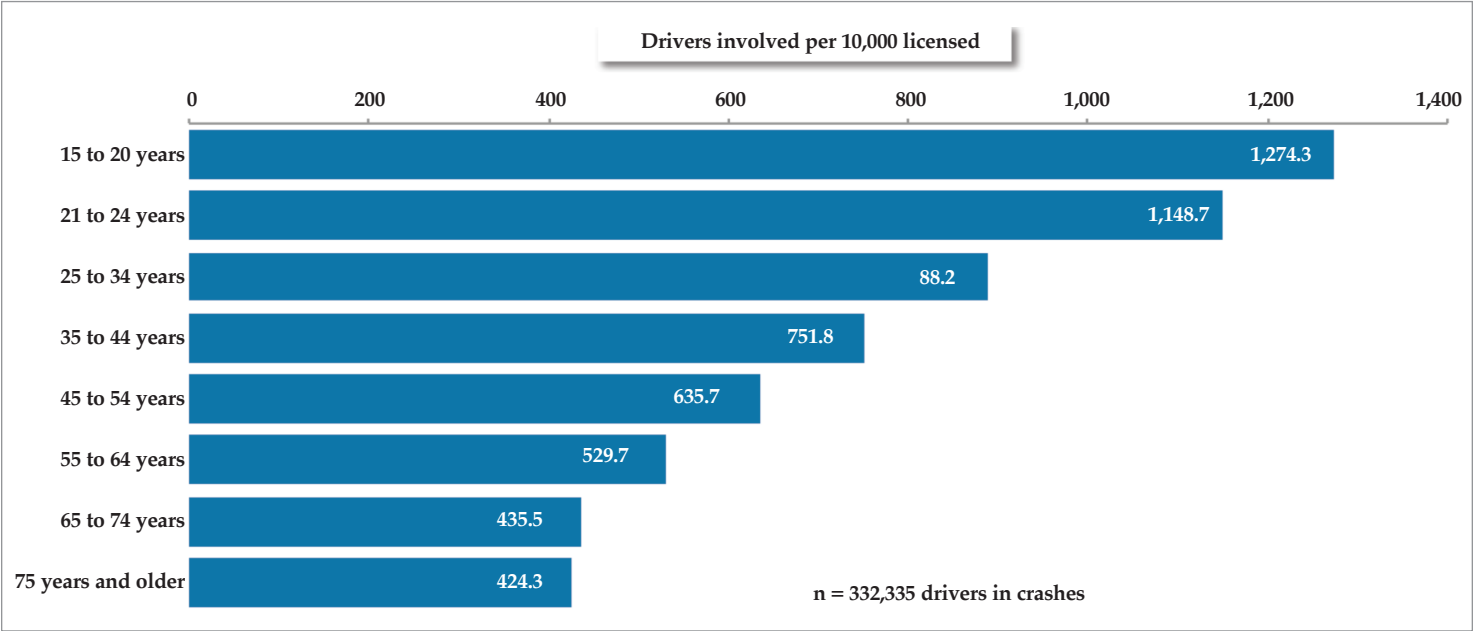
INDIANA GRADUATE DRIVER'S LICENSING (GDL) LAWS

Graduated Driver's Licensing (GDL) systems are intended to delay full licensure of young drivers while they gain driving experience under lower risk conditions. These systems generally consist of three stages—learners, intermediate, full licensure—with decreasing levels of supervision and restraints. All 50 states and the District of Columbia have implemented GDL systems. Indiana state law requires new drivers to complete two prerequisite stages of licensure to acquire a full privilege license. Individuals can acquire a first stage learners permit if they are at least 16 years old, or if they are 15 and enrolled in an approved driver education course. Drivers with a learner's permit must be accompanied by a licensed driver over the age of 25 when operating a motor vehicle. Once a learner's permit has been held for at least six months, the driver can obtain an intermediate stage license. For an intermediate license the driver must be over the age of 16 years and 90 days with prior driver education, or 16 years and 270 days without prior driver education. Once a driver meets these requirements he or she is required to pass an exam and skills test to move onto the intermediate stage of licensure.

Drivers with an intermediate stage license are placed on a 180-day probationary period with driving restrictions. During this probationary period, drivers are limited to driving between the hours of 5 a.m. and 10 p.m., unless transporting children, siblings, or spouses; going to work, school, or religious functions that require the individual to drive outside of this time frame; another licensed driver is present. Drivers in the probationary period must also refrain from transporting passengers, unless passengers are family or over the age of 25. If the individual is under the age of 18 following the 180-day probationary period of intermediate stage licensure, the individual is limited to driving between the hours of 5 a.m. and 11 p.m. Sunday through Thursday, and 5 a.m. through 1 a.m. Friday and Saturday, unless they meet the exceptions listed above. Once the driver is 18 and has met all other requirements they will be eligible for a full privilege license without restrictions. Drivers under the age of 18 are not allowed to use a "telecommunications device" while driving (talking on a cell phone, texting, etc.) with the exception of making a 911 emergency call.

Sources: IC 9-24-3, IC 9-24-11, IC 31-37-3; available at <http://iga.in.gov/legislative/laws/2016/ic/titles/009/>

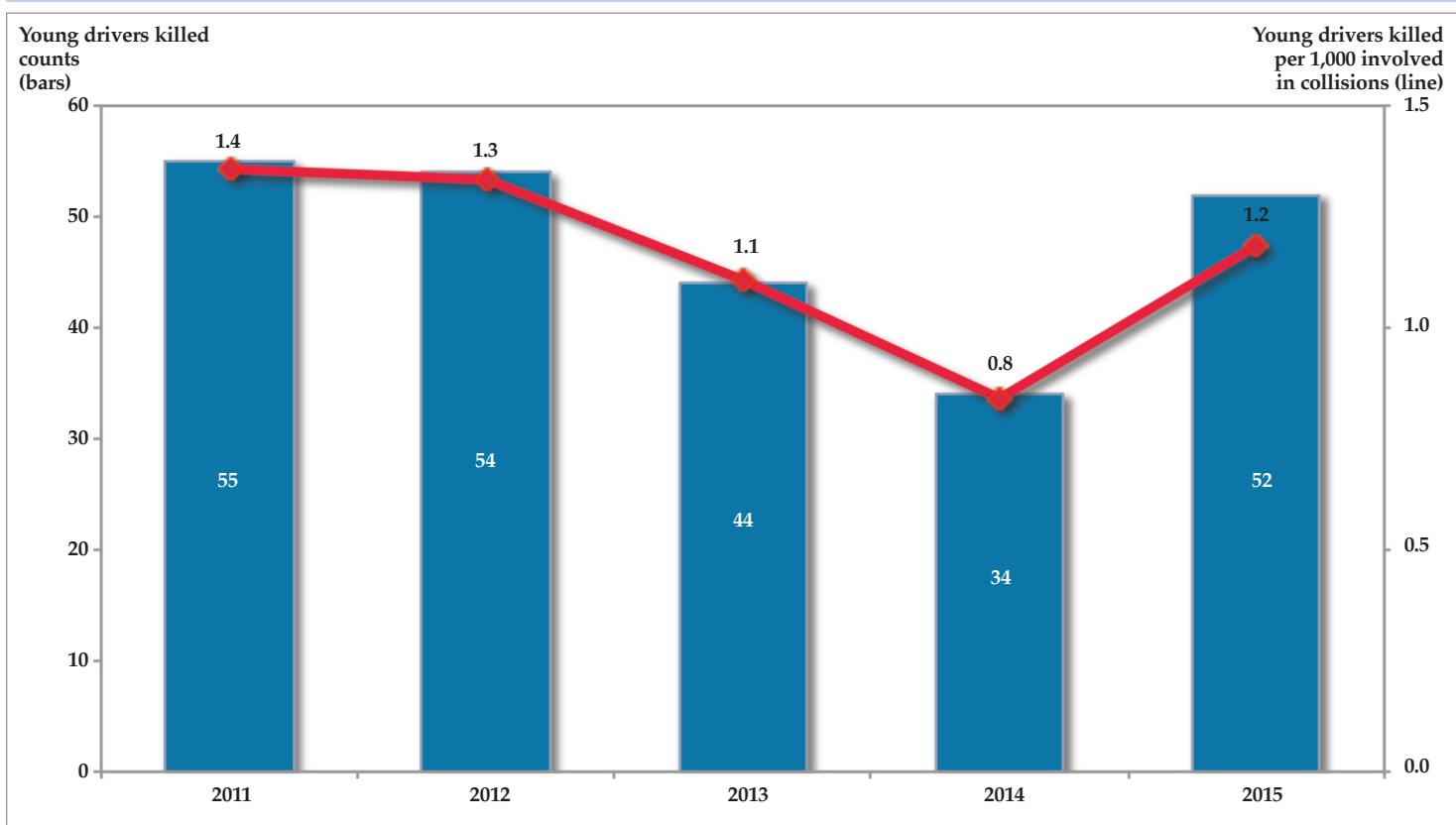
Figure 4.1. Drivers in Indiana crashes per 10,000 licensed, by age group, 2015



Sources: Indiana State Police Automated Reporting Information Exchange System (ARIES), as of March 17, 2016; Indiana Bureau of Motor Vehicles

- Notes:
- 1) Vehicle types reported as *animal-drawn vehicle*, *pedestrian*, and *bicycle* are excluded. *Unknown* vehicle types are also excluded.
 - 2) Drivers with unknown or invalid age are excluded.

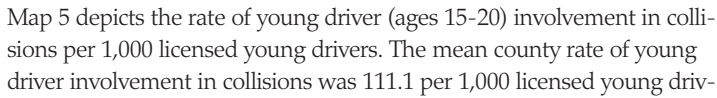
Figure 4.2. Young drivers killed in Indiana collisions, 2011-2015



Sources: Indiana State Police Automated Reporting Information Exchange System, as of March 17, 2016; Indiana Bureau of Motor Vehicles, as of April 20, 2016

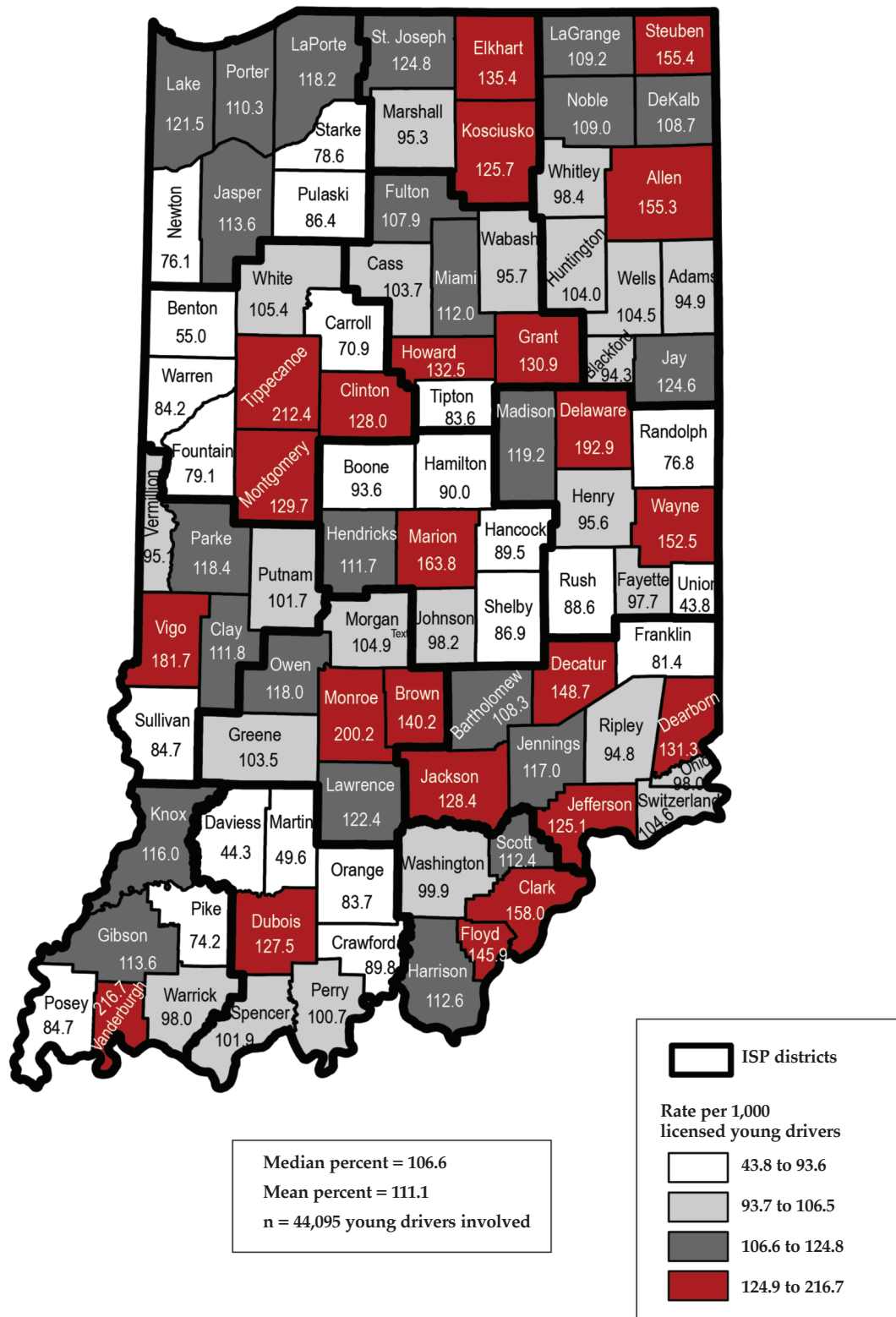
Notes:

- 1) *Young drivers* include drivers ages 15 to 20 years old.
- 2) *Non-motorists* and *unknown* vehicle types are excluded.



ers, and the median county rate was 106.6. Counties that house large universities (Vanderburgh, Tippecanoe, Monroe, Vigo, and Delaware) had high rates of young driver involvement in collisions.

Map 5. Young drivers (ages 15-20) involved in collisions per 1,000 licensed young drivers, 2015



Source: Indiana State Police Automated Reporting Information Exchange System, as of March 17, 2016

NHTSA RECOMMENDED STRATEGIES AND COUNTERMEASURES

The NHTSA publication, *Countermeasures that work: A highway safety countermeasure guide for State highway safety offices*, recommends a number of strategies for improving young driver safety (Goodwin et al., 2015). Broadly, these include the following:

1. Graduated Driver Licensing (GDL) that addresses young driver inexperience by raising the minimum age of full licensure
2. Driver education developed to teach both driving skills and safe driving practices and, when combined with an effective GDL program, does not allow lowering of licensing age
3. Parental involvement in setting personal limits on teen driving as well as limits formally involved through GDL requirements, such as minimum hours of supervised driving practice

Five specific countermeasures that NHTSA found to be effective are highlighted below. Each of the following received at least a:

- 3 star rating—likely to be effective based on balance of evidence from high quality evaluations or other sources;
- 4 star rating—demonstrated to be effective in certain situations; or
- 5 star rating—likely to be effective based on balance of evidence from high-quality evaluations or other sources.

Graduated Driver Licensing – 5 star rating

GDL is a three-phase system for beginning drivers, consisting of a learner's permit, an intermediate license, and a full license. All states currently have a three-phase GDL system (GHSA, 2014a; IIHS, 2014a). A learner's permit allows driving only while supervised by a fully licensed driver. Unsupervised driving under certain restrictions is allowed with an intermediate license, including limits on driving with teenage passengers or driving at night. The learner's permit and intermediate license must be held for a specified minimum period of time.

By allowing beginning drivers to acquire driving experience under direct supervision and in less risky situations during the learner's permit phase, GDL reduces risk and exposure. During the intermediate phase, dangerous situations, such as late-night driving or driving with teenage passengers in the vehicle are avoided. GDL helps ensure that young drivers are more mature by the time they receive their first unrestricted license. Based on a relatively recent national survey, the majority of parents support strong GDL policies and some that are stronger than current policies (Williams, Braintman, & McCartt, 2011).

GDL programs that are most restrictive, including a 6-month waiting period during the learner's permit stage, a nighttime restriction on driving no later than 10 p.m., and restrictions allowing no more than one teen passenger in a young driver's car, were found to reduce fatal crashes by 38 percent and injury crashes by 40 percent among 16-year old drivers (Baker et al., 2007).

Learner's permit length, supervised hours – 5 star rating

With a learner's permit, young drivers are allowed to drive when accompanied and supervised by an adult. Beginning drivers are allowed and encouraged to obtain substantial driving experience during this phase. Forty-eight states, including Indiana, require learner's permits to be held for at least 6 months. Eight states require a twelve month minimum holding period. Most states, including Indiana, require a minimum number of supervised driving time with half requiring 50 hours. While some states reduced or eliminated supervised driving requirements for driver education graduates, this is not recommended. Mayhew found that such practices result in higher crash rates among young drivers (2007). Research shows that longer holding periods (9- to 12-months) for learner's permits result in lower rates of fatal crashes among 16- and 17-year old drivers (Masten et al., 2013). Additionally, once GDL is in place, any additional requirements for the learner's permit can be implemented with minimal cost (Goodwin et al., 2015).

Intermediate – nighttime restrictions – 5 star rating

Numerous studies have found that nighttime driving increases the fatal crash risk per mile of travel among all drivers and especially young drivers (Hedlund et al., 2003; Williams, 2003; Tefft, Williams, & Grabowski, 2013b). While nighttime restricted hours vary across states, the most common hours are between 11 p.m. or midnight and 5 or 6 a.m. Research demonstrates that travel times earlier than midnight prevent crashes, particularly among young drivers (Foss & Goodwin, 2003; Williams, 2003). According to NHTSA's Motor Vehicle Occupant Safety Survey, nearly three-quarters of the general public believe teenagers should not be allowed to drive unsupervised after 9 p.m. (Block & Walker, 2008). Once GDL is in place, restrictions regarding nighttime driving can be implemented or amended with minimal cost.

Intermediate – passenger restrictions – 5 star rating

Goodwin et al. cite numerous studies demonstrating that young passengers are associated with a substantial increase in the risk of a fatal crash for teenage drivers, with each additional passenger being associated with an even greater increase in fatal crash risk. This is particularly so young male drivers with passengers of the same age who are also male (2015). Most states' GDL requirements for intermediate licensure include passenger restrictions. According to NHTSA's Motor Vehicle Occupant Safety Survey, a substantial majority of the general public believe that





teenagers should be restricted with the number of teenage passengers in particular whom they are allowed to carry (Block & Walker, 2008). As with other restrictions, once GDL is in place, minimal costs are incurred when passenger restrictions are amended.

Enforcement of GDL and zero-tolerance laws – 3 star rating

According to Goodwin et al., “two traffic laws apply only to young drivers, including GDL laws and zero-tolerance laws that set a maximum BAC of .02 or less for drivers under 21” (2015, p. 6-27). The authors argue that since zero-tolerance laws are not actively publicized or enforced, there is potential to reduce teenage drinking and driving by increasing awareness and enforcement of these laws.

Certain provisions of GDL, such as nighttime driving restrictions, are difficult to enforce, as violations are hard to detect (Hedlund et al., 2003). While surveys of law enforcement officers indicate support for GDL, officers may not be familiar with GDL requirements, and enforcement of GDL is not a high priority (Goodwin & Foss, 2004). Goodwin et al., also note that, given the difficulty in identifying young drivers under GDL systems, one countermeasure and a NHTSA GDL recommendation is that “young drivers should be required to affix a vehicle decal identifying them as qualifying for the GDL program to make them more readily identifiable” (2015, p. 6-27).



RESOURCES

Additional information regarding young drivers can be found at the following agencies and organizations:

- Centers for Disease Control and Prevention: www.cdc.gov/Motorvehiclesafety/Teen_Drivers/index.html
- Governors' Highway Safety Association: www.ghsa.org/html/issues/teens/index.html
- Insurance Institute for Highway Safety: www.iihs.org/iihs/topics/t/teenagers/topicoverview
- National Safety Council: www.nsc.org/safety_road/TeenDriving/Pages/teen_driving.aspx
- American Automobile Association: <http://exchange.aaa.com/safety/teen-driver-safety/>

NHTSA resources

- Teen Drivers - www.nhtsa.gov/Teen-Drivers
- Behavioral Safety Research Reports - <http://ntlsearch.bts.gov/repository/ntlc/nhtsa/index.shtm>
- Driver Safety Research Reports: New Drivers - <http://www.nhtsa.gov/testing/young>

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A grayscale photograph of a cyclist riding a road bike. The cyclist's hands are on the handlebars, and their arms are visible. The background is a blurred city street with buildings and a car.

Non-Motorists



OVERVIEW

In 2015, as showing in Figure 5.1, 1,793 pedestrians were involved in Indiana collisions (Payton, 2016). The percentage of pedestrians involved in collisions who were killed increased each year from 3.5 percent in 2011 to 5.1 percent in 2015. In the US in 2014 (latest data available) pedestrian deaths accounted for 15 percent of all traffic fatalities in motor vehicle traffic crashes (NHTSA, DOT HS 812 270, 2016). Figure 5.2 depicts bicyclists involved in Indiana collisions and percent that were fatal. During 2011-2015 in Indiana, the percentage of pedalcyclists killed in collisions was lowest in 2015, at less than 1 percent. In the US in 2014 (latest data available) 726 pedalcyclists deaths accounted for 2 percent of all traffic fatalities during the year.

INDIANA NON-MOTORIST LAWS

Pedestrian Law

In Indiana, a person who drives a vehicle approaching a yield sign has to slow down to a speed reasonable for the existing conditions, or stop if necessary. The driver of the vehicle has to yield the right-of-way to a pedestrian legally crossing the roadway and to another vehicle in the intersection. If a person who drives a vehicle is involved in a collision with a pedestrian in a crosswalk or a vehicle in the intersection after driving past a yield sign without stopping, the collision is considered evidence of the person's failure to yield the right-of-way.

Pedestrians on the other hand must follow special pedestrian control signals at marked crosswalks. Between adjacent intersections at which traffic control signals are in operation, pedestrians may not cross at any place except in a marked crosswalk. In places where there are no traffic control signals between adjacent intersections, a pedestrian crossing a roadway at a point other than within a marked crosswalk or within an unmarked crosswalk at an intersection has to yield the right-of-way to all vehicles on the roadway.

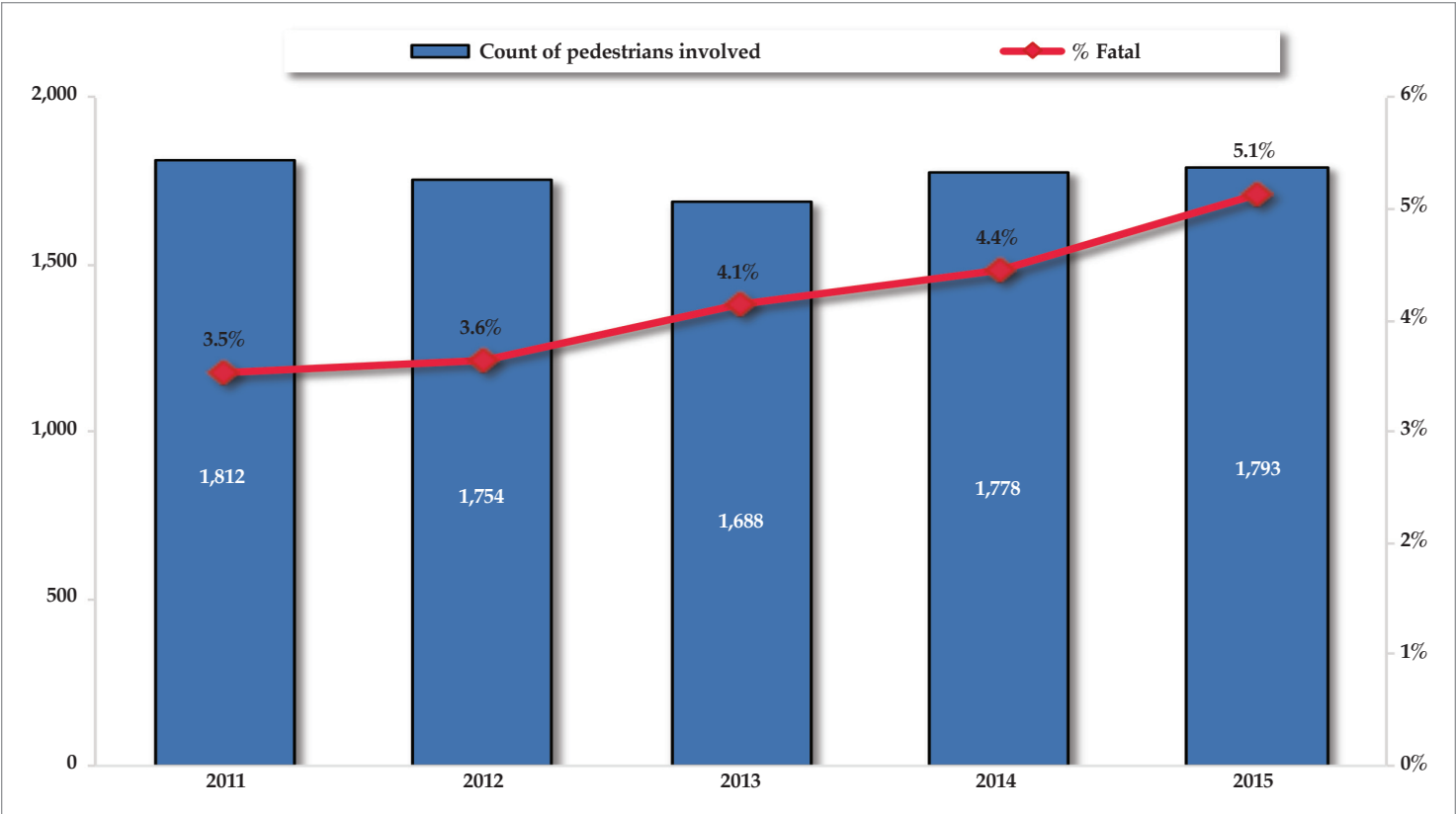
Bicycle Law

Under current Indiana law, a person riding a bicycle upon a roadway has all the rights and duties (with some exceptions) outlined in Indiana code 9-21-11 that are applicable to a person who drives a vehicle. For example, a person who operates a bicycle on a roadway must use the proper hand and arm signals (found in the Indiana Drivers Manual) to indicate when he or she is changing lanes or turning. Similarly, a person operating a bicycle has a duty of due care to avoid colliding with a pedestrian or a person propelling a human powered vehicle, giving an audible signal when necessary. While drinking and biking may seem like a safer option than drinking and driving, the legal blood alcohol concentration (BAC) limit while riding a bike is the same as if driving a car.

Sources:

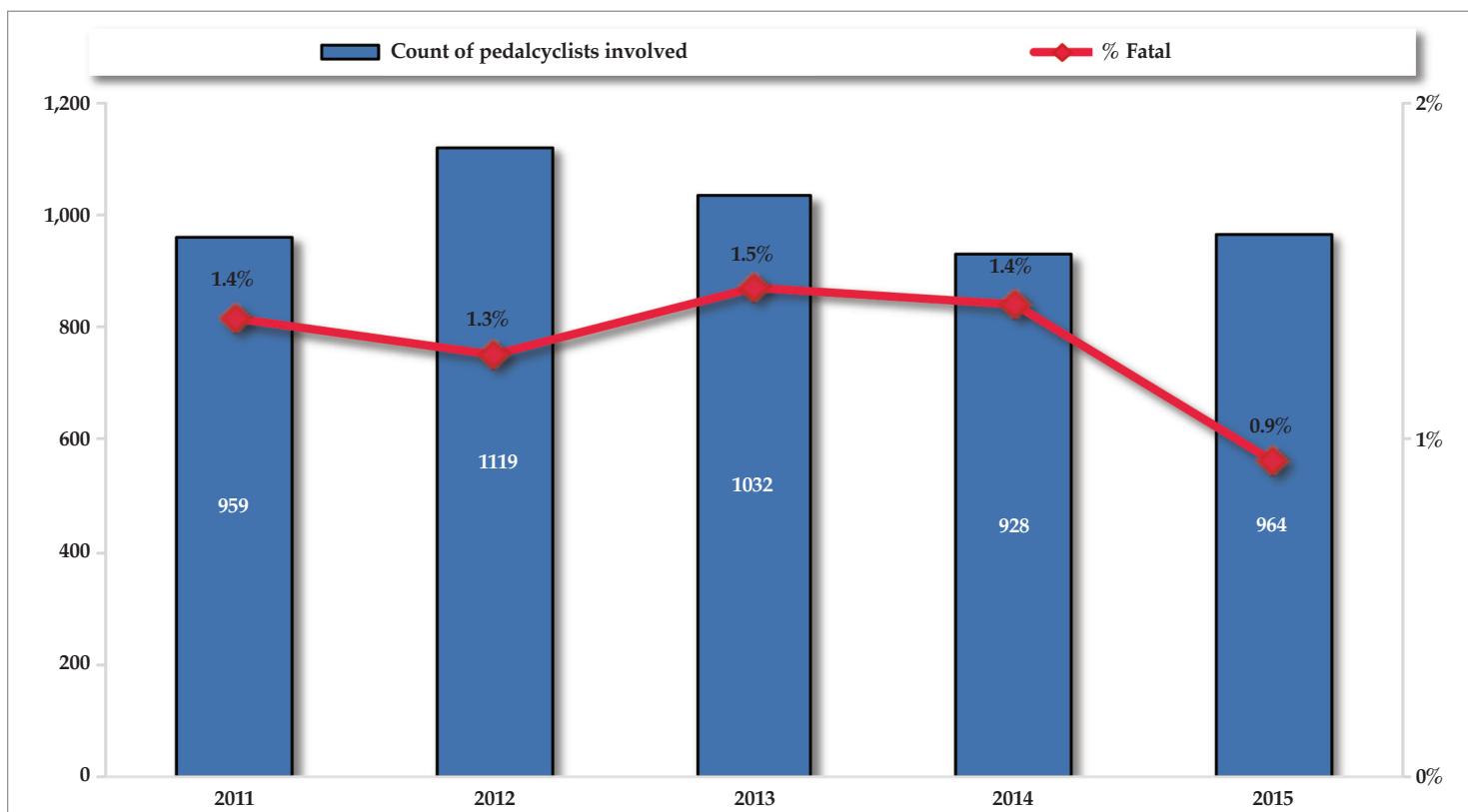
Indiana Pedestrian Law, IC 9-21-17; available at iga.in.gov/static-documents/c/9/0/8/c908ae37/TITLE9_AR21_ch17.pdf
Indiana Bicycle Law, 9-21-11; available at iga.in.gov/legislative/laws/2016/ic/titles/009/

Figure 5.1. Pedestrians involved in Indiana collisions and fatality rate, 2011-2015



Source: Indiana State Police Automated Reporting Information Exchange System, as of March 17, 2016

Figure 5.2. Pedalcyclists involved in Indiana collisions and fatality rate, 2011-2015

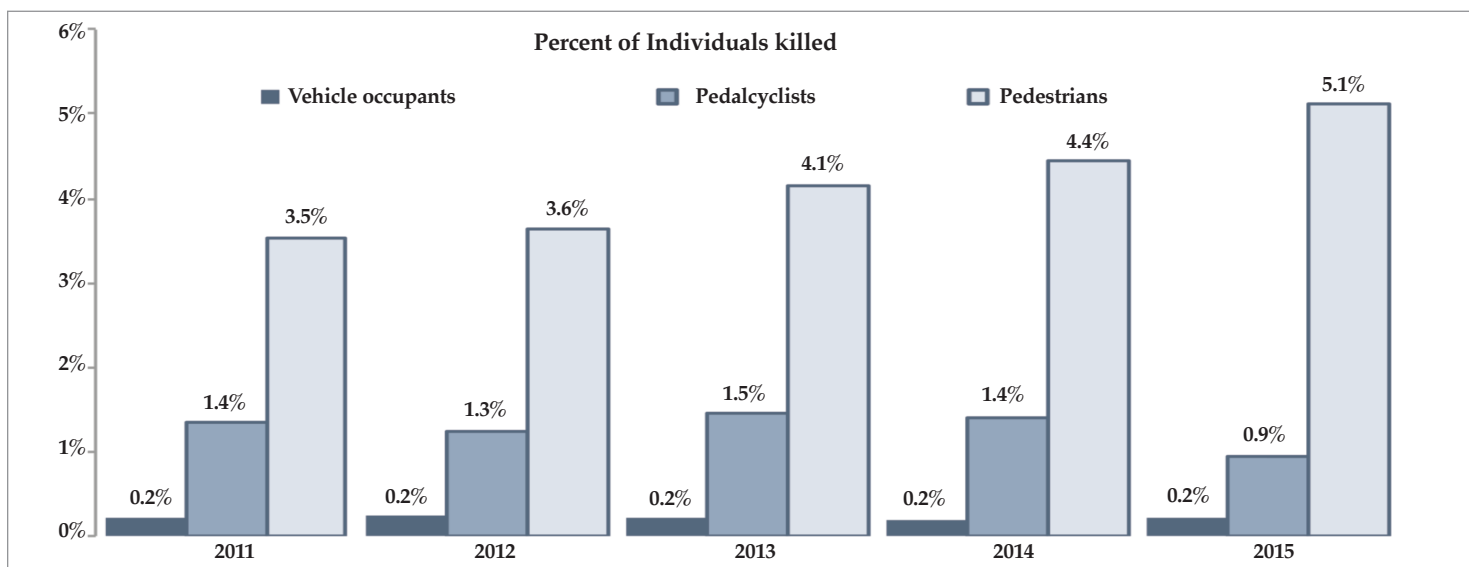


Source: Indiana State Police Automated Reporting Information Exchange System, as of March 17, 2016

In 2015, non-motorists (pedestrians and pedalcyclists) represented less than 1 percent of all individuals in traffic collisions, but 12 percent of total Indiana traffic fatalities (not shown). The percent of all pedestrians in Indiana crashes that were killed increased from 4.4 percent in 2014 to 5.1

percent in 2015 and has been on the rise since 2011 (Figure 5.3). The percent of vehicle occupants killed in collisions remained steady during this same time period, and the percent of pedalcyclist fatalities in crashes declined slightly in 2015.

Figure 5.2. Pedalcyclists involved in Indiana collisions and fatality rate, 2011-2015



Source: Indiana State Police Automated Reporting Information Exchange System, as of March 17, 2016

Notes:

1) Animal-drawn vehicle occupants are excluded.

2) The most recent ARIES upgrade added a clarification to reporting officers on the definition of incapacitating injuries criteria to include "transported from scene for treatment"; therefore, 2014 and 2015 increases in incapacitating injuries reflect a definitional change and should be interpreted with caution.



PEDESTRIANS

NHTSA RECOMMENDED STRATEGIES AND COUNTERMEASURES

The NHTSA publication, *Countermeasures that work: A highway safety countermeasure guide for State highway safety offices*, recommends a number of strategies for improving pedestrian safety (Goodwin et al., 2015). Broadly, these include the following:

1. Creation of pedestrian safety zones through increased crossing times
2. Reduction of vehicle speed limits to allow pedestrians and drivers more time to react
3. Conspicuity enhancement through the use of reflective clothing
4. Enhanced and targeted enforcement of pedestrian crossing zones
5. Increased pedestrian training for elementary-age children

Five specific countermeasures that NHTSA found to be effective are highlighted below. Each of the following received at least a:

- 3 star rating—likely to be effective based on balance of evidence from high-quality evaluations or other sources;
- 4 star rating—demonstrated to be effective in certain situations; or
- 5 star rating—likely to be effective based on balance of evidence from high-quality evaluations or other sources.

Creation of pedestrian safety zones through increased crossing times – 4 star rating

The pedestrian safety zone concept originated from a collaborative study by NHTSA and FHWA (Blomberg & Cleven, 1998). Safety zones are identified and targeted high-risk areas where pedestrian-related accidents tend to occur. In Miami-Dade County, Florida, properly designed and implemented pedestrian zone programs effectively reduced crashes and injuries for older pedestrians (Blomberg & Cleven, 1998) as well as for impaired pedestrians (Blomberg & Cleven, 2000). These zones also reduced crashes involving child and adult pedestrians (Zegeer, Blomberg, et al., 2008; Zegeer, Henderson, et al., 2008). Safety zones provide significant risk reduction for high-risk groups and the general public. Increasing enforcement, awareness, and the use of other countermeasures for identified safety zones can be cost-effective methods of improvement for these high-risk areas.

Studies covering the implementation of these initiatives have indicated significant improvements. A Florida study found that four zones, which comprised less than 1 percent of the county's total land area, accounted for roughly 20 percent of the total crashes (Zegeer, Henderson et al., 2008). Further analyses detected that some areas had high child involvement in crashes, while certain corridors had high young adult involvement (particularly at night), and still other areas had high senior involvement. Overall, program implementation resulted in an 8.5 percent to 13.3 percent reduction in pedestrian crash rates during and following the

implementation, when compared to control groups (Zegeer, Blomberg, et al., 2008). Identifying, targeting, and correcting high-risk areas through the use of pedestrian safety zones and proper countermeasures can allow pedestrians and drivers more time to react. Implementing countermeasures, such as lengthening the signal times to allow longer pedestrian intervals, can create real benefits for pedestrian safety. However, Goodwin et al., indicate that establishing these pedestrian safety zone program can require moderately high costs and time due to the substantial amount of analysis, planning, and time for implementation of such programs and countermeasures (2015).

Reduction of vehicle speed limits to allow pedestrians and drivers more time to react – 3 star rating

Reducing speed limits can greatly shorten the length of time and distance it takes to stop a vehicle. These factors can significantly reduce risk for pedestrians. Several studies indicate higher vehicle speeds result in greater frequency and severity of pedestrian crashes and casualties (Leaf & Preusser, 1999; Rosen & Sander, 2009; Tefft, 2011). Studies have also found that along with reducing risks for pedestrians, reduced speeds limits also decrease the risk of fatality in collisions that do occur. Rosen and Sander (2009) assessed fatality risk curves based on driver impact speeds, ranging from eight percent at 50 km/h (31 mph) to 50 percent at 75 km/h (about 47 mph).

Lowered speed limits may not completely eliminate pedestrian risk, but can be effective life-saving measures. Actual speeds, however, are reduced by only a fraction of the reduction in speed limits. For every 5 mph speed limit reduction, a corresponding 1 to 2 mph speed reduction has been shown. Even 1 to 2 mph reductions in average speed tend to substantially reduce fatal and injury crashes overall. The highest percentage of reductions occurs on streets with lower initial speeds (AASHTO, 2010, Table 3E-2; and see Chapter 3).

A reduction in the number of vehicles speeding in residential neighborhoods, high traffic areas, and other high-risk areas can yield quality results. According to Blomberg and Cleven (2006), demonstration programs in two cities where speed limit enforcement was combined with engineering changes and extensive publicity reduced both average speeds and the number of speeders in residential neighborhoods. In locations where speed reduction measures do not yield independently effective results, combining these speed limit reductions with engineering changes can increase effectiveness. For example, roads intended for higher speeds should have separate pedestrians from traffic as they walk down the road (on sidewalks), or cross the road (e.g., median refuges and signals that provide opportunities to cross). These design elements are also keys to overall safer environments (Howard, Mooren, Nilsson, Quimby, & Vadeby, 2008). Enforcing speed limit reductions can greatly facilitate the compliance of such changes. Goodwin et al., note that these measures can be implemented quickly, at a relatively low cost, but the extent of benefits is not conclusive (2015).

Conspicuity enhancement through the use of reflective clothing – 3 star rating

Increasing pedestrian conspicuity can increase their visibility to drivers, especially at night. Visibility issues can be mitigated by the use of highly reflective and fluorescent clothing. Reflective clothing makes pedestrians discernible hundreds of feet farther away than normal clothing, even with low-beam illumination (Karsh, Hedlund, Tyson & Leaf, 2012;

NCHRP, 2004, Strategy B5). Drivers have a limited field of vision in the dark, and pedestrians in dark clothing may decrease their own visibility greatly. Pedestrians often overestimate their own visibility to drivers (Karsh, Hedlund, Tyson, & Leaf, 2012). Enhancing conspicuity through the use of reflective clothing can reduce risk collisions. Nighttime collisions account for 72 percent of pedestrian fatalities nationally (NHTSA, 2015b). Increasing awareness of clothing and visibility recommendations can decrease this. In 2012, more than 15 percent of pedestrian fatalities involved pedestrians who were not visible to the driver, as a result dark clothing, no lighting, etc. (NHTSA, 2014a, Table 100). Increasing awareness of conspicuity enhancements can be a low-cost method of risk reductions, but can take time. Currently, certain programs aimed at measure have already been established. NHTSA's child education program includes information about conspicuity messages targeting different age groups (See www.nhtsa.gov/ChildPedestrianSafetyCurriculum).

Enhanced and targeted enforcement – 3 star rating

A comparative study in Gainesville, FL showed positive results from sustained, enhanced high-visibility enforcement of motorist yielding to pedestrians. Enforcement was coupled with publicity and other community outreach, such as flyers distributed to stopped drivers, communications sent home with school children, roadside feedback signs, and earned and paid media (Van Houten, Malenfant, Blomberg, Huitema, & Casella, 2013; Van Houten, Malenfant, Huitema, & Blomberg, 2013). Throughout the one-year study period, driver yielding rose; the period included four two-week waves of enforcement, combined with other activities. Four of the six enforcement sites showed significant increases in yielding at the end of the implementation period. Increasing enforcement of traffic safety laws can also help to ensure drivers and pedestrians maintain higher levels of situational awareness, particularly in high-risk areas. This study also found that awareness of enforcement and understanding consequences of improper actions can reduce risky actions substantially.

Increasing awareness and compliance through enforcement can create lasting positive behavioral modifications. A NHTSA study by Savolainen, Gates, and Datta (2011) performed two pedestrian-oriented enforcement campaigns at Wayne State University seeking to educate pedestrians on proper crosswalk use and the importance of obeying signals through the issuance of warnings. Pedestrian violations (walking outside the crosswalk or against the signal) declined by 17 percent to 27 percent immediately following the campaign, and reductions of 8 percent to 10 percent continued for several weeks after conclusion of active enforcement. These initiatives can be implemented rather quickly once high-risk areas are identified, but maintaining these improvements can take long-term initiatives to ensure adequate reductions in risky behavior. A North Carolina pilot study found that after more stringent

prosecution was publicized, a feared increase in court caseloads did not materialize, because more drivers paid their citations automatically (Hunter, Thomas, & Stewart, 2001). This can be costly depending on the level of enforcement used and continued implementation of public awareness campaigns.

Increased pedestrian training for elementary-age children – 3 star rating

Increasing pedestrian training with young children can yield certain benefits. Such programs can be implemented quickly and easily through school systems. A consensus from a review of literature is that practical training—learning by doing with reinforcement of correct behaviors—is the most effective means for children to learn traffic safety skills (Bruce & McGrath, 2005; Dragutinovic & Twisk, 2006; Percer, 2009). Learning these skills and being able to implement them early on can reduce an individual's risk of improper road safety techniques. Some studies have found children with some independent walking experience to be less likely to make the wrong decisions (Congiu et al., 2008). Improving pedestrian training and experience at a young age can enable children to better identify and mitigate risks. A number of child training programs have already been established. The NHTSA updated its "Willy Whistle" pedestrian safety videos. For children in grades K-2, "Stop and Look and Listen with Willy Whistle" (2008) emphasizes looking left-right-left before crossing, and for children in grades 3-6, "Getting There Safely" (2014) teaches critical thinking skills for walking around traffic. Additionally, NHTSA developed a Child Pedestrian Safety Curriculum in 2011 for elementary-age students, as well as an instructor guide (www.nhtsa.gov/ChildPedestrianSafetyCurriculum). The curriculum includes five lesson plans for each grade group: Kindergarten through 1st grade, 2nd through 3rd grade, and 4th through 5th grade.

Training programs can also be established on more localized levels, such as the WalkSafe program in Florida, which was implemented as part of a comprehensive initiative to reduce pedestrian crashes in Miami-Dade





County (Zegeer et al., 2008a). Increasing awareness in high-risk areas can be critical to improve public safety. Five-day and three-day WalkSafe programs in the Miami school district use videos, prescribed curricula, workbooks, and outdoor simulations on an imaginary road on school grounds; upon evaluation these showed improvements in safety knowledge compared to before the program implementation. Grades K-3 showed more consistent improvements than grades 4 and 5. In the short term, in-traffic behaviors also reportedly improved, but the behavior changes did not hold up at 3 months post-program and no comparison group was used (Hotz et al., 2004; Hotz et al., 2009). A two-year study of the longer-term impacts of the WalkSafe program evaluated knowledge and behavior of more than 1,500 students undergoing once yearly WalkSafe instruction (Livingston et al., 2011). While short- and medium-term knowledge retention was observed among all grades, only children moving from 3rd to 4th grade demonstrated long-term (i.e., more than a year) knowledge retention of pedestrian safety behaviors. Numerous versions of this type of program exist as new approaches sometimes achieve more effective and lasting results. This may be attributed to the fact that program effectiveness is dependent on the age, demographics, and location of the trainees. Some programs have been developed to focus on and address more rural pedestrian concerns (Cleven & Blomberg, 1994).

Other initiatives include the Pedestrian Safer Journey, developed for the Federal Highway Administration. It includes separate video-based training modules for child pedestrians ages 5 to 9, 10 to 14, and 15 to 18, along with educator materials and discussion guides. These resources are available on the Pedestrian and Bicycle Information Center website at www.pedbikeinfo.org/pedsaferjourney/index.html. In addition, the National Center for Safe Routes to School provides extensive educational

materials, including Teaching Children to Walk Safely as They Grow and Develop: A Guide for Parents and Caregivers, which lists learning objectives and tips for caregivers of children ages 4 and older. This resource can be found at

www.saferoutesinfo.org/sites/default/files/TeachingChildrentoWalkSafely.pdf. Educators, parents, drivers, children, and even neighbors can find resources and tips at <http://guide.saferoutesinfo.org/education/>. Not only can these programs help to mitigate risks independently, but combined initiatives can help to reinforce these goals.

A number of studies have found that knowledge and behaviors of young children can be improved through education and training programs, but behavior in real-world traffic situations is more likely to change if training includes an interactive component with opportunities for practice and positive reinforcement (Percer, 2009). Understanding proper procedures and how to maintain situational awareness may generate positive results, but lasting results require continued reinforcement. Studies conclude that interactive training with multiple opportunities for feedback, correction, and practice may lead to longer-lasting behavior modification (Tolmie et al., 2005; Albert & Dolgin, 2009). With increased retention comes substantial increases in behavior improvements. Gates, Savolainen, Datta, and Buck (2010) documented the importance of repetition in school-based trainings. Gates et al., (2010) conducted a study of 930 Detroit students in grades 2 to 7, in which pedestrian safety training was offered once and then again 7 to 12 months later. Measures of safety violations were collected through observing street-crossing behaviors before and after trainings, and pre/post-tests were administered to assess changes in awareness and knowledge. The initial training boosted both test scores and observed behaviors, but the improvements were only partially sustained.

RESOURCES

Additional information regarding pedestrian and bicycle safety can be found at the following agencies and organizations:

- Office of Planning, Environment, & Realty (Pedestrian and Bicycle Program)— www.fhwa.dot.gov/planning/processes/pedestrian_bicycle/
- Safety Office, Pedestrian and Bicycle Safety— safety.fhwa.dot.gov/ped_bike/ped_focus/
- Federal Highway Administration Research and Technology, Coordinating, Developing, and Delivering Highway Transportation Innovations, Pedestrian and Bicyclist Safety—www.fhwa.dot.gov/research/topics/safety/pedbike/
- Pedestrian and Bicycle Information Center—www.pedbikeinfo.org
- National Center for Safe Routes to School—www.saferoutesinfo.org
- Research and Administrative Technology Administration, National Transportation Library, Bicycle and Pedestrian Research—ntlsearch.bts.gov/repository/category.do?cat=5
- Smart Growth America, National Complete Streets Coalition—www.smartgrowthamerica.org/complete-streets
- SAFE KIDS Worldwide—www.safekids.org
- Safe Routes to School National Partnership—www.saferoutespartnership.org
- Safe States Alliance—www.safestates.org/
- United States Access Board—www.access-board.gov
- National Center for Bicycling and Walking—www.bikewalk.org
- America Walks—www.americawalks.org
- Alliance for Walking and Biking—<http://www.bikewalkalliance.org/>
- Association of Pedestrian and Bicycle Professionals—www.apbp.org

NHTSA resources

- Pedestrians—www.nhtsa.gov/Pedestrians
- Research and Evaluation—www.nhtsa.gov/Driving+Safety/Research+&+Evaluation

Several specific resources that provide further information on engineering, enforcement, and educational strategies are included below:

- Child Pedestrian Safety Curriculum (NHTSA, 2011)—www.nhtsa.gov/ChildPedestrianSafetyCurriculum
- Pedestrian Safer Journey: Skills for Safe Walking for Ages 5 to 18—www.pedbikeinfo.org/pedsaferjourney/
- Everyone is a Pedestrian online resource—www.nhtsa.gov/everyoneisapedestrian
- Uniform Guidelines for State Highway Safety Programs: Highway Safety Program Guideline No. 14: Pedestrian and Bicycle Safety—www.nhtsa.gov/nhtsa/whatsup/tea21/tea21programs/pages/PedBikeSafety.htm
- How to Develop a Pedestrian Safety Action Plan (FHWA & NHTSA, 2006)—
http://safety.fhwa.dot.gov/ped_bike/ped_focus/docs/fhwasa0512.pdf
- Pedestrian Safety Training for Law Enforcement (NHTSA, 2011)—
[http://www.nhtsa.gov/Driving+Safety/Pedestrians/Pedestrian+Safety+Training+for+Law+Enforcement+\(CD-ROM\)](http://www.nhtsa.gov/Driving+Safety/Pedestrians/Pedestrian+Safety+Training+for+Law+Enforcement+(CD-ROM))
- The Pedestrian Safety Workshop: A Focus on Older Adults, Instructor Guide (NHTSA, 2010)—
www.nhtsa.gov/staticfiles/nti/older_drivers/pdf/PedSafetyWorkshop-02.pdf
- Pedestrian Countermeasure Policy Best Practice Report (Redmon, 2011)—
http://safety.fhwa.dot.gov/ped_bike/tools_solve/fhwasa11017/fhwasa11017.pdf
- Public Policies for Pedestrian and Bicycle Safety and Mobility: An Implementation Project of the Pedestrian and Bicyclist Safety and Mobility International Scan—http://international.fhwa.dot.gov/pubs/pl10028/pl10028_duplex.pdf
- AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities—
https://bookstore.transportation.org/item_details.aspx?id=119
- NCHRP Report 500 Guide for Reducing Collisions Involving Pedestrians (National Cooperative Highway Research Program, 2004)—
onlinepubs.trb.org/Onlinepubs/nchrp/nchrp_rpt_500v10.pdf
- National Center for Safe Routes to School. Enforcement: Role for Law Enforcement in SRTS—
www.saferoutesinfo.org/program-tools/enforcement-role-law-enforcement-srts
- NHTSA, 2013: Identifying Countermeasure Strategies to Increase Safety of Older Pedestrians—www.nhtsa.gov/staticfiles/nti/pdf/811799.pdf
- FHWA, 2013: PEDSAFE: Pedestrian Safety Guide and Countermeasure Selection System—www.pedbikesafe.org/PEDSAFE/
- FHWA, 2014: Road Diet Informational Guide—http://safety.fhwa.dot.gov/road_diets/info_guide/rdig.pdf
- People, Safer Streets: Summary of U.S. Department of Transportation Action Plan to Increase Walking and Biking and Reduce Pedestrian and Bicyclist Fatalities (2014)—www.dot.gov/sites/dot.gov/files/docs/safer_people_safer_streets_summary_doc_acc_v1-11-9.pdf
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http://apps.who.int/iris/bitstream/10665/79753/1/9789241505352_eng.pdf?ua=1



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[www.nhtsa.gov/DOT/NHTSA/Traffic percent20Injury percent20Control/Articles/Associated percent20Files/810964.pdf](http://www.nhtsa.gov/DOT/NHTSA/Traffic%20Injury%20Control/Articles/Associated%20Files/810964.pdf)



BICYCLES

NHTSA RECOMMENDED STRATEGIES AND COUNTERMEASURES

The NHTSA publication, *Countermeasures that work: A highway safety countermeasure guide for State highway safety offices*, recommends a number of strategies for improving bicyclist safety (Goodwin et al., 2015). Broadly, these include the following:

1. Increased helmet use through helmet laws
2. Conspicuity enhancement through the use of reflective clothing and lighting
3. Reduction of distracted driving
4. Increased public awareness of how to safely interact with bicyclists
5. Decreased impaired riding and driving

Three specific countermeasures that NHTSA found to be effective are highlighted below. Each of the following received at least a:

- 3 star rating—likely to be effective based on balance of evidence from high-quality evaluations or other sources;
- 4 star rating—demonstrated to be effective in certain situations; or
- 5 star rating—likely to be effective based on balance of evidence from high-quality evaluations or other sources.

Increased helmet use through adult helmet laws – 5 star rating

Bicycle helmet laws can greatly increase helmet use for all ages, and are associated with a significant reduction in head injuries. Elvik (2011) conducted a meta-analysis of bicycle helmet effectiveness and found that bicycle helmet use results in an estimated 42 percent (95 percent CI [25, 55]) reduction in the risk of non-fatal head injury. Researchers have found helmet non-use to correlate with increased risk for all types of severe injury (Boufous et al., 2012). Wearing protective gear, particularly helmets, can protect against a range of injuries.

Enacting helmet use laws can increase helmet use among all ages. Foreign studies found that as a result of such laws, the proportion of helmet-wearing cyclists involved in crashes increased from 20 percent to more than 60 percent among children, and to more than 70 percent among adults. Among adults, the increase occurred within two months of a law's effective date; the increase was more gradual among children (Walter et al., 2011). Increasing helmet use among adults can lead to a trickle-down benefit, where helmet use in children accompanying these adults may increase. This method has been demonstrated to be effective through numerous studies, and tends to be a quick and low-cost method of improvement for helmet use rates.

Increased helmet for children though helmet laws – 5 star rating

Although nearly half of US states have helmet use laws for children, the state of Indiana does not. Helmet use laws can substantially reduce risks of injuries. Protective effects of helmet use has been shown as 50 percent for moderate injury, 62 percent for serious injury, and 75 percent for severe head injury (Bambach et al., 2013). These results demonstrate substantial benefits, which can be crucial in years where riders are learning to ride and may be more susceptible to falls and accidents. Crash-trend analyses using FARS data showed a 15 percent reduction in child bicycle fatalities in the long run correlating to State helmet use laws for children (Grant & Rutner, 2004)."

Reductions in head or traumatic brain injury following legislation were reported in two of three controlled studies (Macpherson & Spinks, 2007). This reduction in injury can be correlated with the fact that helmet use laws can greatly increase helmet use among riders. Numerous studies found that helmet use laws do increase overall rider helmet use, but improvements differ by age groups. Canadian studies noted an increase in helmet use ranging from 75 percent to 92 percent among children, from 30 percent to 63 percent among adolescents, and from 52 percent to 55 percent among adults (Karkaneh et al., 2011). The effectiveness of this legislation can be enhanced in combination with related publicity and education campaigns or programs (Rivara, Thompson, Patterson, and Thompson, 1998; Kanny, Schieber, Pryor, and Kresnow, 2001; and Rodgers, 2002).

Goodwin et al., (2015) note that such initiatives can be effective methods for increasing helmet use and reducing risk. Additional resources may be required to accommodate costs associated with these initiatives, depending on the extent of the education program implementation. Usually these initiatives can be enacted in a relatively short timeframe, and tend to be effective.



Conspicuity enhancement through the use of reflective clothing and lighting – 3 star rating

Improving bicycle conspicuity can reduce risk of collision with motor vehicles. Increasing bike rider visibility, especially at night, can help drivers identify bicyclists in advance. Current Indiana law (IC 9 21 11 9) advises that “A bicycle operated on a highway from one half (1/2) hour after sunset until one half (1/2) hour before sunrise must be equipped with the following: A lamp on the front exhibiting a white light visible from a distance of at least five hundred (500) feet to the front. A lamp on the rear exhibiting a red light visible from a distance of five hundred (500) feet to the rear or a red reflector visible from a distance of five hundred (500) feet to the rear.” Under Consumer Product Safety Commissions requirements, these reflectors are mandatory on all new equipment, however, there are no manufacturer requirements for the attachment of front lamps required by Indiana state law for nighttime use. Additionally, reflectors and lamps may degrade or become damaged over time. As a result, NCHRP (2008) advocates increased enforcement of laws in combination with coordinated communications and outreach efforts. This effort can heighten awareness among cyclists of both the need for proper lighting and the benefits of retroreflective materials.

Although the use of proper lighting can increase visibility, an Australian study found the use of a bicycle light alone, whether static or flashing, did not increase the conspicuity of the bicyclist among drivers in the

study; researchers concluded that additional conspicuity improvement measures may be needed. Additionally, this same study concluded that bicyclist clothing (specifically vests and ankle and knee reflectors) significantly improved conspicuity, enabling drivers to react to bicyclists from a farther distance than when the bicyclist wore only a vest or no reflective material at all (Wood et al., 2012). The use of such attire is highly recommended, especially during nighttime rides, as even low beam headlights can illuminate riders wearing florescent materials hundreds of feet away; much farther than riders wearing normal clothing (NCHRP, 2004, Strategy B5; NCHRP, 2008, Strategy F2). This can allow drivers an extended field of view and a time frame to react within. Not only does such clothing greatly improve nighttime visibility, a Cochrane review of studies also concluded that the use of fluorescent yellow, red, and orange materials improved driver detection during the day (Kwan & Mapstone, 2004).

Numerous studies have found consistent use of fluorescent colors to provide a protective effect against crashes and injuries (Thornley, Woodward, Langley, Ameratunga, & Rodgers, 2008). Increasing use through enforcement and awareness can reduce rider and driver risks alike. Cost and time may vary for the implementation of awareness programs and enforcement of active light laws. Goodwin et al., (2015) note that outreach, training of officers, and enforcement of these laws may be associated with moderate costs.



RESOURCES

Additional information regarding bicyclists can be found at the following agencies and organizations:

- Federal Highway Administration:
 - Office of Planning, Environment, & Realty (Pedestrian and Bicycle Program)—www.fhwa.dot.gov/environment/bicycle_pedestrian/
 - Office of Safety—safety.fhwa.dot.gov/ped_bike/
- Centers for Disease Control and Prevention—www.cdc.gov/
- Pedestrian and Bicycle Information Center—www.pedbikeinfo.org/
- National Center for Safe Routes to School—www.saferoutesinfo.org
- SAFE KIDS Worldwide—www.safekids.org
- Consumer Product Safety Commission—www.cpsc.gov
- Bicycle Helmet Safety Institute—www.helmets.org
- Association of Pedestrian and Bicycle Professionals—www.apbp.org
- Complete Streets Coalition—www.completestreets.org
- National Center for Bicycling and Walking—www.bikewalk.org
- Safe Routes to School National Partnership—www.saferoutespartnership.org
- League of American Bicyclists—www.bikeleague.org
- Alliance for Walking and Bicycling—www.bikewalkalliance.org

NHTSA resources

- Bicycles—www.nhtsa.gov/Bicycles
- Research and Evaluation—www.nhtsa.gov/Driving+Safety/Research+&+Evaluation
- Behavioral Safety Research Reports—ntlsearch.bts.gov/repository/ntlc/nhtsa/index.shtm

Several resources that provide further information on engineering, enforcement, and educational strategies are included below:

- AASHTO Guide for the Development of Bicycle Facilities, 4th Edition, American Association of State Highway and Transportation Officials—bookstore.transportation.org/collection_detail.aspx?ID=116
- NACTO Urban Bikeway Design Guide, National Association of City Transportation Officials—nacto.org/cities-for-cycling/design-guide/
- Public Policies for Pedestrian and Bicycle Safety and Mobility—An Implementation Project of the Pedestrian and Bicyclist Safety and Mobility International Scan: katana.hsrc.unc.edu/cms/downloads/PBSPolicyReview.pdf
- Uniform Guidelines for State Highway Safety Programs—Highway Safety Program Guideline No. 14: Pedestrian and Bicycle Safety: [http://www.nhtsa.gov/DOT/NHTSA/Traffic percent20Injury percent20Control/Articles/Associated percent20Files/PedBikeSafety.pdf](http://www.nhtsa.gov/DOT/NHTSA/Traffic%20Injury%20Control/Articles/Associated%20Files/PedBikeSafety.pdf)
- National Cooperative Highway Safety Research Program, NCHRP Report 500, Volume 18, A Guide for Reducing Collisions Involving Bicycles (NCHRP, 2008)—onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_500v18.pdf
- Resources released or updated since the prior edition: Bicycle Safer Journey: Skills for Safe Bicycling for Ages 5 to 18—www.pedbikeinfo.org/bicyclesaferjourney/
- BIKESAFE: Bicycle Countermeasure Selection System—www.pedbikesafe.org/BIKESAFE/
- National Center for Safe Routes to School (SRTS), Enforcement: Role for Law Enforcement in SRTS—<http://www.saferoutesinfo.org/program-tools/enforcement-role-law-enforcement-srts>
- A Resident's Guide for Creating a Safer Communities for Walking and Biking—http://safety.fhwa.dot.gov/ped_bike/ped_cmunity/ped_walkguide/

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INDIANA TRAFFIC SAFETY FACTS



Motorcycles



OVERVIEW

In 2015, there were 3,263 collisions in Indiana involving motorcycles. As reported in *Indiana traffic safety facts: Motorcycles, 2015*, a total of 107 motorcycle and motor driven cycle (class B) drivers died in collisions and 2,607 were injured (Nunn, 2016). Nationally, motorcyclists accounted for 14 percent of all motor vehicle related fatalities in 2014 (NCSA, 2016). In Indiana in 2015, motorcyclists comprised 13 percent of all traffic fatalities. From 2011 to 2015, in Indiana fatalities per 100,000 motorcycle registrations declined from 55 to 42. Considering only motorcyclists for whom helmet use and age were known, unhelmeted collision-involved motorcyclists had higher fatality (4.2 percent) and injury rates (72 percent) than helmeted riders. By age group, the highest helmet use among collision-involved motorcyclists was among riders 21 to 24 years old (52 percent). The lowest rate of helmet use was among riders 35 to 44 years old (28 percent). In 2015, certain collisions involving select primary factors were more likely to be the fault of motorcyclists in multi-vehicle collisions, including unsafe speed, improper passing, driving left of center, and speed too fast for weather conditions.

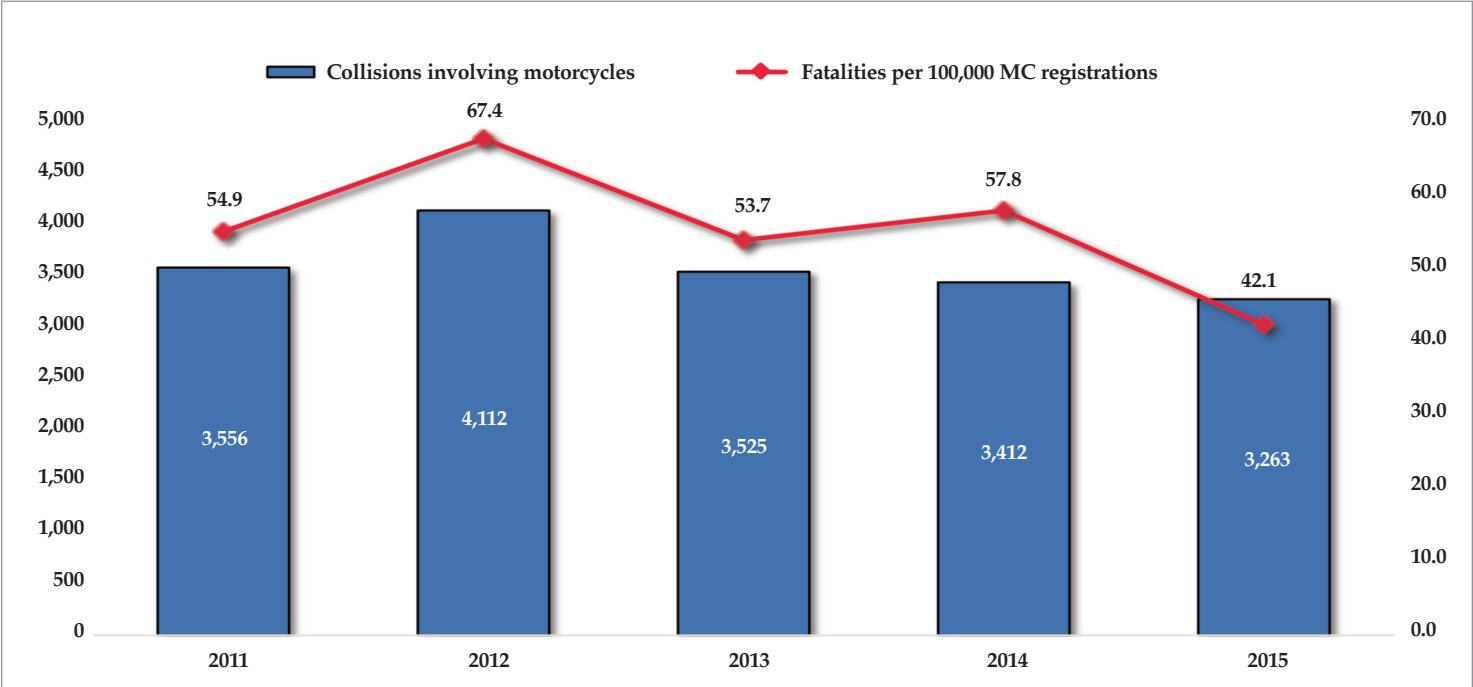
INDIANA MOTORCYCLE LAWS

Indiana law requires motorcycle operators to hold a motorcycle endorsement on their license in order to legally operate a motorcycle. Drivers must complete Ride Safe Indiana (RSI) authorized Motorcycle Operator Safety Education Course or have passed a motorcycle knowledge test and riding skills test.ⁱ Motorcycle operators may also be required to pass a vision test. Although Indiana does not have a helmet requirement law for adult motorcyclists, riders under the age of 18 are required to wear a helmet that meets the standards established by the United States Department of Transportation under 49 CFR 571.218 effective January 1, 1979. Minors are also required to wear protective glasses, goggles, or a transparent face shield when in operation of a motorcycle.

Motorcycles on Indiana roadways must also meet equipment requirements.ⁱⁱ A motorcycle manufactured after January 1, 1956, must be properly equipped with a speedometer, a rear view mirror, brakes in good working order on both front and rear wheels, footrests or pegs for both operator and passenger, and lamps and reflectors meeting the standards of the United States Department of Transportation.

ⁱ Motorcycle License Endorsement or Learner's Permit, IC 9-24-8; available at <http://iga.in.gov/legislative/laws/2016/ic/titles/009/>
ⁱⁱ Motorcycle equipment requirements, IC 9-19-7, available at <http://iga.in.gov/legislative/laws/2016/ic/titles/009/>

Figure 6.1. Indiana motorcycle collisions, fatalities per 100,000 registrations, 2011-2015

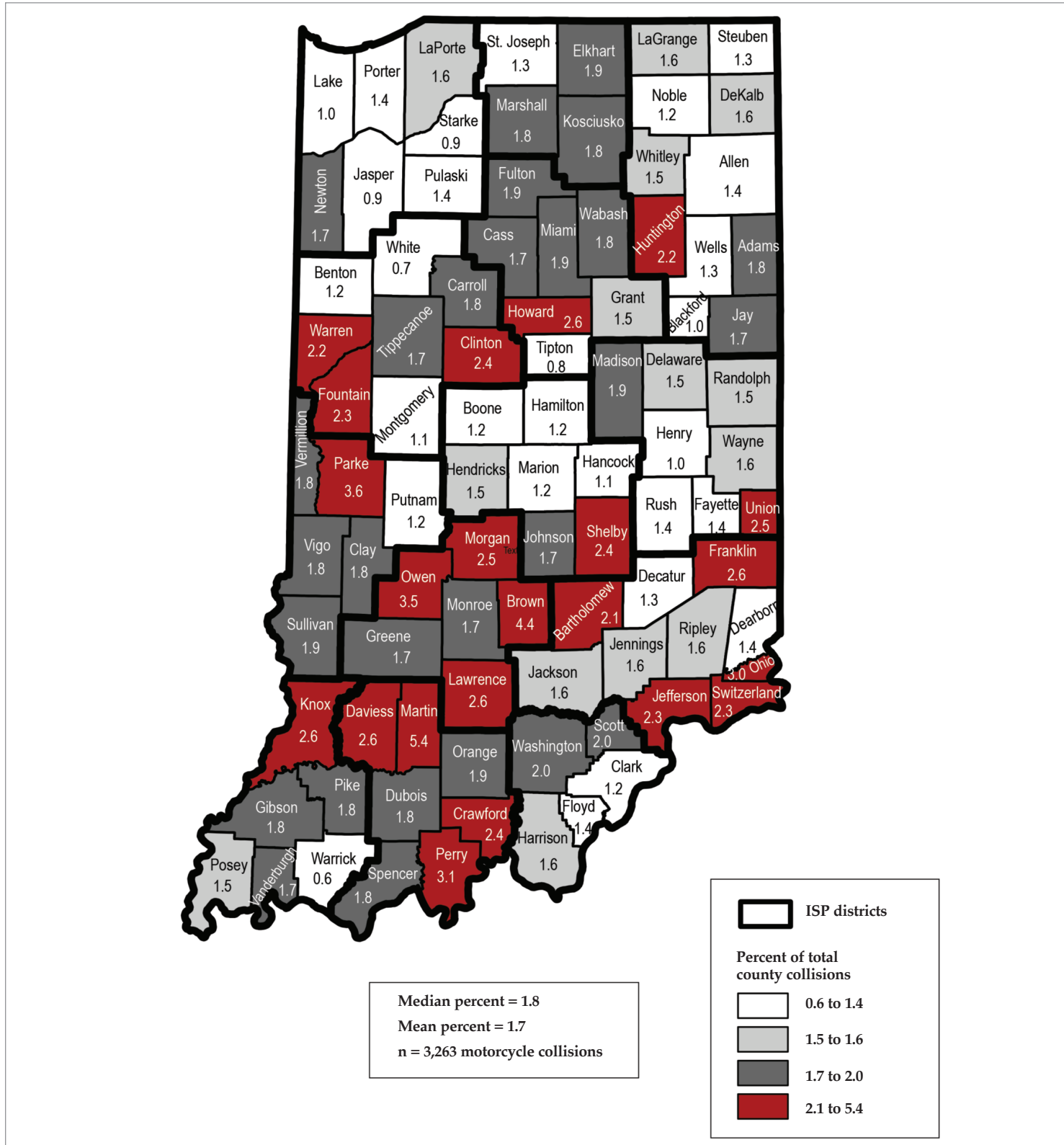


Sources: Indiana State Police Automated Reporting Information Exchange System, as of March 17, 2016; Indiana Bureau of Motor Vehicles, as of April 20, 2016
Note: Motorcycles are defined as vehicles reported ARIES as *motorcycle, moped, class A and B motor driven cycles, and motorized bicycle.*

Map 6 depicts the percentage of county collisions that involved a motorcycle in 2015 with Indiana State Police (ISP) districts. As shown in the map, the highest percentages of collisions involving motorcycles occurred

in the southern Indiana counties of Martin (5.4 percent) and Brown (4.4 percent), located in IPS districts Jasper and Brown.

Map 6. Percentage of county collisions that involved a motorcycle, 2015



Source: Indiana State Police Automated Reporting Information Exchange System, as of March 17, 2016



NHTSA RECOMMENDED STRATEGIES AND COUNTERMEASURES

The NHTSA publication, *Countermeasures that work: A highway safety countermeasure guide for State highway safety offices*, recommends a number of strategies for improving motorcycle safety (Goodwin et al., 2015). Broadly, these include the following:

1. All motorcycle riders wear helmets that meet Federal Motor Vehicle Safety Standard (FMVSS) 218
2. Reduce alcohol-impaired motorcycle riding
3. Increase proper licensing and the completion of rider training courses
4. Increase motorcycle awareness in the community and motorcycle visibility through the use of improved reflective gear on the road
5. Implement antilock brakes to enhance motorcycle safety

Two specific countermeasures that NHTSA found to be effective are highlighted below. Each of the following received at least a:

- 3 star rating—likely to be effective based on balance of evidence from high quality evaluations or other sources;
- 4 star rating—demonstrated to be effective in certain situations; or
- 5 star rating—likely to be effective based on balance of evidence from high-quality evaluations or other sources.

Universal Coverage State Motorcycle Helmet Use Laws – 5 star rating

Universal helmet use laws generate substantial positive benefits.

“Research indicates that helmets reduce motorcycle rider fatalities by 22 to 42% and brain injuries by 41 to 69%,” (Coben, Steiner, & Miller, 2007; Cummings, Rivara, Olson, & Smith, 2006; Deuterman, 2004; Liu, Ivers, Norton, Blows, & Lo, 2008; NHTSA, 2003; NHTSA, 2006a) Goodwin et al. note that the implementation of universal helmet use laws was “demonstrated to be effective by several high-quality evaluations with consistent results” (Goodwin et al., 2015). Not only are these methods effective, but they can be implemented with current resources in a very short time frame, typically less than three months according to Goodwin et al.

Indiana, along with several other states, repealed universal helmet use laws in 1977, which created a gap in helmet use rates between these states and those that continue to implement universal helmet laws. States that do mandate helmet use laws “had motorcycle helmet use rates 53 percentage points higher than States with partial coverage or no law; had 29% fewer deaths; and had lower fatality rates per registered motorcycle and per vehicle mile traveled” (CDC, 2013). Indiana law does mandate helmet use for riders under the age of 18, but rates of helmet use at all ages are still substantially lower than states with universal helmet use laws. Lower rates of helmet use directly correlate with higher rates of injury and death. “GAO concluded that motorcycle rider fatality rates were 20 to 40% lower with universal helmet laws” (GAO, 1991; Ulmer & Preusser, 2003, Section II). The benefits associated with helmet use laws expose the necessity of such initiatives. Goodwin et al., found that once legislation requiring universal helmet use has been enacted, costs of implementation are minimal. Helmet use is easily observed and laws can be enforced during regular traffic patrol operations.



Alcohol-Impaired Motorcyclists: Detection, Enforcement, and Sanctions – 3 star rating

Driving while under the influence of alcohol or any other mind-altering substance can greatly increase risks. This is especially true for motorcycle drivers, who are already at an increased risk to injury, since they are more vulnerable than drivers in passenger vehicles. Training officers to identify cues for the detection of impaired motorcycle drivers is essential to eliminate this activity. Stuster (1993) identified and validated 14 cues useful for identifying alcohol-impaired motorcycle riders. NHTSA prepared a brochure, a law enforcement training video, and a pocket detection guide discussing the cues (NHTSA, 2000b).

Identifying impaired drivers and enforcing DUI laws can generate positive impacts, but using effective sanctions can be an even more effective means of reduction policy. Implementing strict impoundment and forfeiture policies for noncompliant drivers increases penalties for impaired drivers. These strategies can increase visibility of enforcement policies, which may in turn reduce these risky behaviors. Goodwin et al. noted that these initiatives “are likely to be effective based on balance of evidence from high-quality evaluations”, cost and time constraints for these policies do vary, (Goodwin et al., 2015).



RESOURCES

- Government Accountability Office’s Report to Congressional Committees – www.gao.gov/assets/660/650037.pdf
- Guide to Community Preventive Services Community Guide: Use of Motorcycle Helmets – www.thecommunityguide.org/mvoi/motorcyclehelmets/index.html

NHTSA web pages

- Motorcycles – www.nhtsa.gov/Safety/Motorcycles
- Research and Evaluation – www.nhtsa.gov/Research/Behavioral+Research
- Behavioral Safety Research Reports – <http://ntlsearch.bts.gov/repository/ntlc/nhtsa/index.shtm>



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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.

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An electronic copy of this document can be accessed via the PPI website (www.policyinstitute.iu.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 tenth 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 on county and municipality data. 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. Collisions 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.

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 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.



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