

INDIANA TRAFFIC SAFETY FACTS

May 2008



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

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

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



DANGEROUS DRIVING 2007

The National Highway Traffic Safety Administration (NHTSA) defines *dangerous driving* (often used interchangeably with *aggressive driving*) as an "individual committing a combination of moving traffic offenses so as to endanger other persons or property."¹ This definition encompasses risky driving, such as running red lights, or weaving in traffic, as well as other actions such as hand gestures, shouting, and flashing high beams on other vehicles. Another frequent component of dangerous driving is speeding.

In 2007, 3,044 collisions involving some form of aggressive driving occurred in Indiana. In addition, there were 18,487 collisions involving speed-related driving (nine percent of all collisions). Speeding is among the most common factors contributing to traffic collisions. Nationally in 2006, 31 percent of fatal collisions involved speeding and speed-related collisions claimed 13,543 lives—up three percent from 13,113 in 2005.² Beyond loss of life, NHTSA has estimated that speed-related collisions cost society \$40.4 billion per year or \$1,281 per second (2000 estimate).

This fact sheet provides summary data on Indiana traffic collisions involving dangerous driving. Though the use of alcohol and/or drugs during driving could be categorized as dangerous driving, the primary focus here is on collisions involving **aggressive driving** (as defined in Indiana Code (IC) 9-21-8-55) and **speeding** (IC 9-21-5-1).³ Summary figures include general trends in collisions and injuries, location aspects of these types of collisions, and the effects of alcohol and restraint use on injuries. Unless otherwise noted, data are taken from the Automated Reporting Information Exchange System (ARIES), maintained by the Indiana State Police. The topics of aggressive driving and speed-related collisions will be considered in separate sections.

¹National Highway Traffic Safety Administration, notes on aggressive driving, retrieved March 15, 2008, from <http://www.nhtsa.dot.gov/portal/site/nhtsa/menuitem.67eeecd05574f18227983419cdba046a0/>

²National Highway Traffic Safety Administration, National Center for Statistics and Analysis. *Traffic Safety Facts, Speeding*, 2006 data. DOT HS 810 814.

³There is overlap between aggressive driving and speeding as both definitions can include "unsafe speed" as a contributing or primary factor.

Aggressive Driving

The state of Indiana defines aggressive driving (IC 9-21-8-55) as:

during one (1) episode of continuous driving of a vehicle, the person does or commits at least three (3) of the following: (1) Following a vehicle too closely in violation of IC 9-21-8-14; (2) Unsafe operation of a vehicle in violation of IC 9-21-8-24; (3) Overtaking another vehicle on the right by driving off the roadway in violation of IC 9-21-8-6; (4) Unsafe stopping or slowing a vehicle in violation of IC 9-21-8-26; (5) Unnecessary sounding of the horn in violation of IC 9-19-5-2; (6) Failure to yield in violation of IC 9-21-8-29 through IC 9-21-8-34; (7) Failure to obey a traffic control device in violation of IC 9-21-8-41; (8) Driving at an unsafe speed in violation of IC 9-21-5; (9) Repeatedly flashing the vehicle's headlights

This fact sheet defines aggressive driving as any collision where the driver of a motor vehicle was engaged in at least two of the following actions: (1) driving at an unsafe speed; (2) failing to yield right of way; (3) disregarding a regulatory signal/sign; (4) improper passing; (5) improper turning; (6) improper lane usage; or (7) following too closely. Although Indiana law requires that three of these actions be committed to be considered as an aggressive driving offense, this fact sheet is limited to two offenses because currently an officer responding to an Indiana collision may only enter a maximum of two driver-related contributing factors for a particular vehicle.

General trends in aggressive driving

In 2007, the 3,044 collisions in Indiana involving aggressive driving represented 1.5 percent of all collisions for the year (Table 1). Approximately 2.6 percent of all fatal collisions involved aggressive driving, an average annual increase of 4.5 percent since 2003. Among individuals injured in aggressive driving collisions, 21 of 1,384 were fatal injuries in 2007, a 5.2 percent decrease since 2003. In 2007, 85.7 percent (18 of 21) of all aggressive driving fatalities were incurred by drivers in the collision, compared to 68.0 percent (927 of 1,363) of non-fatal injuries.

Table 1: Indiana collisions and injuries with aggressive driving (AD) involvement, by severity, 2003-2007

Category	2003	2004	2005	2006	2007	Average Annual Change
Collisions with AD involved	5,121	4,111	3,582	3,240	3,044	-12.0%
Fatal	27	29	23	11	21	6.4%
Incapacitating	94	86	65	96	74	-2.0%
Non-incapacitating	1,195	1,054	902	851	757	-10.7%
Property damage only	3,805	2,942	2,592	2,282	2,192	-12.6%
As % of total collisions	2.4%	2.0%	1.7%	1.7%	1.5%	-11.3%
Fatal	3.6%	3.4%	2.7%	1.3%	2.6%	4.5%
Incapacitating	2.8%	2.6%	2.1%	3.0%	2.4%	-0.7%
Non-incapacitating	3.2%	2.6%	2.3%	2.4%	2.2%	-8.5%
Property damage only	2.2%	1.8%	1.6%	1.5%	1.3%	-12.3%
Injuries with AD involved	1,996	1,854	1,603	1,547	1,384	-8.7%
Fatal	34	32	26	14	21	-5.2%
Driver	24	23	17	9	18	5.7%
Injured vehicle occupant	9	9	9	4	2	-26.4%
Pedestrian	0	0	0	0	0	n/a
Pedalcyclist	1	0	0	1	1	n/a
Non-Fatal	1,962	1,822	1,577	1,533	1,363	-8.6%
Driver	1,397	1,251	1,094	1,074	927	-9.6%
Injured vehicle occupant	541	553	473	452	419	-6.0%
Pedestrian	6	6	4	2	9	66.7%
Pedalcyclist	18	12	6	5	8	-10.0%

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

Notes: Non-fatal injuries include incapacitating, non-incapacitating, and possible injuries
Non-incapacitating includes non-incapacitating and possible injuries.

Table 2: Collisions and injuries in collisions involving aggressive driving, by primary factor, 2007

Primary Factor	Collisions					Injuries			
	Fatal	Non-fatal injury	Property damage only	Total	Total, as % of all AD involved	Fatal	Non-fatal injury	Total	Total, as % of all AD involved
Failure to yield right of way	5	293	632	930	30.6%	5	440	445	32.2%
Disregard signal/reg sign	9	226	330	565	18.6%	9	414	423	30.6%
Improper lane usage	0	47	323	370	12.2%	0	65	65	4.7%
Improper turning	1	61	290	352	11.6%	1	99	100	7.2%
Following too closely	0	90	244	334	11.0%	0	165	165	11.9%
Unsafe speed	2	69	183	254	8.3%	2	110	112	8.1%
Improper passing	2	32	130	164	5.4%	2	46	48	3.5%
Other factor	2	13	60	75	2.5%	2	24	26	1.9%
All aggressive driving (AD) involved	21	831	2,192	3,044	100.0%	21	1,363	1,384	100.0%

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

Notes: Non-fatal injuries include incapacitating, non-incapacitating, and possible injuries

Table 2 shows that in 2007, the most common of the seven aggressive driving factors linked to aggressive driving collisions was failure to yield right of way (930 of 3,044 collisions). Over 62 percent of all injuries and two thirds of fatalities in aggressive driving collisions occurred in collisions where the primary factor was either failing to yield right of way or disregarding regulatory signals/signs.

Table 3: Collisions and injuries involving a motor vehicle that ran a red light, 2003-2007

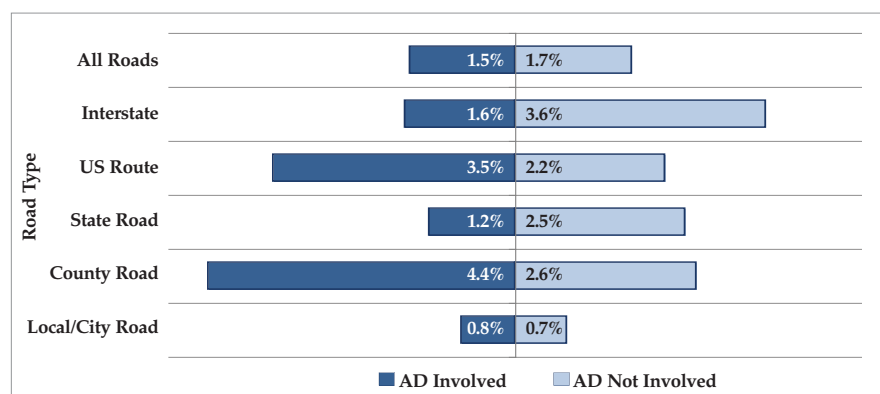
	2003	2004	2005	2006	2007	Average Annual Change
Collisions	5,277	5,080	4,496	2,829	4,740	3.8%
Fatal	28	17	12	15	23	2.4%
Incapacitating	133	169	118	73	114	3.7%
Non-incapacitating	1,894	1,884	1,729	1,065	1,637	1.6%
Property damage only	3,222	3,010	2,637	1,676	2,966	5.4%
Injuries	2,909	2,888	2,428	1,511	2,378	0.7%
Fatal	29	18	13	15	27	7.4%
Incapacitating	179	218	141	100	152	2.3%
Non-incapacitating	2,701	2,652	2,274	1,396	2,199	0.7%

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

Notes: Red-Light Running is defined as a collision that occurred at a road intersection where one or more motor vehicles disregarded a traffic signal or flashing signal

Non-incapacitating includes non-incapacitating and possible injuries

Figure 1: Traffic fatalities per road type as a proportion of all traffic injuries for that road type, by aggressive driving (AD) involvement, 2007



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

Notes: Data exclude cases with an unknown or unreported road type

Red-light running

Red-light running is an issue important to law enforcement and policy makers. Nationwide in 2006, nearly 900 fatalities and 144,000 non-fatal injuries occurred as a result of crashes involving red-light running.⁴ An analysis of red light violation data in four states found that red-light running occurred at a rate of 3.2 times per hour on average.⁵ As shown in Table 3, the incidence of red-

light running collisions in Indiana increased an average of 3.8 percent since 2003, and fatalities from these collisions increased an average of 7.4 percent annually.⁶ In 2007, 0.5 percent of all collisions with red-light running as a factor involved a fatality (23 of 4,740). Of the 2,378 injuries that occurred in this type of collision, 27 (1.1 percent) were fatal injuries.

As of April 2008, over 300 communities in 25 states use automated cameras at signaled intersections to track red-light running.⁷

Location and time

In 2007, aggressive driving collisions in Indiana were most common on local/city roads (58 percent of total), followed by state roads (14 percent) and U.S. routes (12 percent). Proportional to all injuries by road class, fatalities in collisions on county roads and U.S. routes were more likely to occur than non-fatal collisions on these road types when aggressive driving was a factor (Figure 1). The likelihood of a fatality in a collision involving aggressive driving on a county road was 1.7 times that of a county road collision that did not involve aggressive driving (4.4 percent versus 2.6 percent, respectively).

⁴Insurance Institute for Highway Safety (IIHS), retrieved April 15, 2008 from <http://www.iihs.org/research/qanda/rlr.html>

⁵Hill, S.E. & Lindly, J.K. (2003). Red light running prediction and analysis. *UTCA Report No. 02112*. Tuscaloosa, AL: University Transportation Center for Alabama.

⁶For the purposes of this fact sheet, a collision is defined as involving red-light running if the following conditions are met:

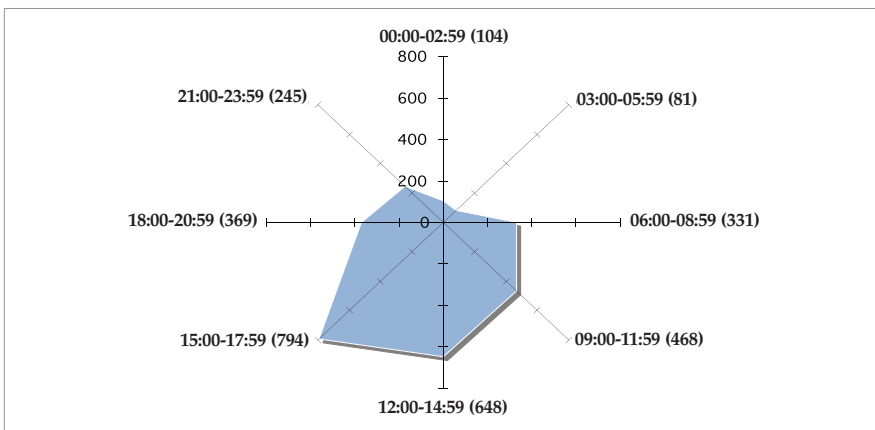
- The intersection type was either four-way; T,Y, five-point; interchange, or ramp
- The traffic signal must have been reported as either Traffic Control Signal or Flashing Signal
- A contributing factor associated with a motor vehicle was Disregard Signal/Regulatory Sign

⁷IIHS, retrieved March 15, 2008, at http://www.iihs.org/research/topics/auto_enforce_cities.html

Indiana collision data from 2007 suggest that aggressive driving is more common among passenger cars in urban localities, and in light trucks and large trucks in rural localities. Specifically, 60 percent (1,438 of 2,396) of vehicles involved in aggressive driv-

ing collisions in an urban locality were passenger vehicles, compared to 53 percent (360 of 683) in rural localities.⁸ The majority of collisions involving aggressive driving occurred during the evening rush hour period (approximately 3pm to 6pm). As seen

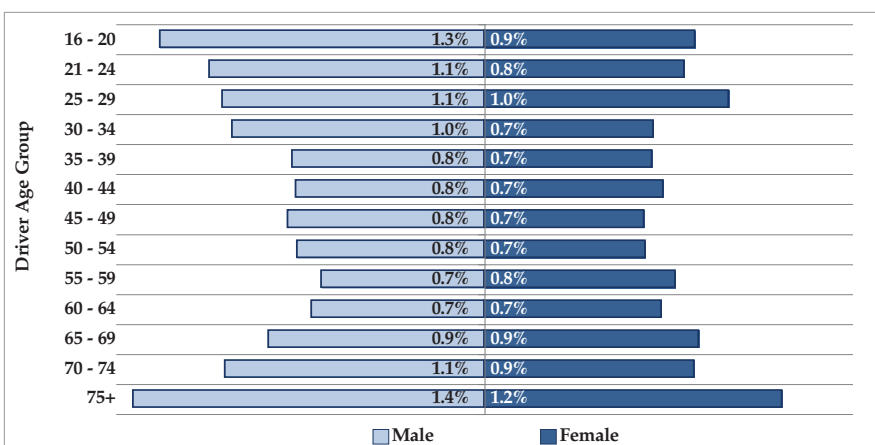
Figure 2: Indiana collisions involving aggressive driving, by time of day (military), 2007



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

Notes: Figure excludes collisions with an invalid or unreported time

Figure 3: Proportion of drivers in Indiana traffic collisions who were engaged in aggressive driving behavior, by age group and gender, 2007



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

Notes: Data exclude drivers with an unknown age or gender

in Figure 2, 26 percent of all aggressive driving collisions occurred during that time period. From noon to 3pm, 648 aggressive driving collisions occurred (21.3 percent of all aggressive driving collisions).

Age and gender effects

Researchers have found that age and gender are statistically significant factors in predicting common aggressive driving behaviors.^{9 10} In one study, men were more than twice as likely to cut in front of other drivers, honk their horns in traffic, and nearly 3.5 times as likely as women to engage in "extreme aggressive measures" such as crossing multiple lanes and driving on the shoulder.¹¹

Of drivers involved in collisions, male drivers were, in general, more likely to have been engaged in aggressive driving than were females. For example, male young drivers were 1.5 times more likely to have been driving aggressively than female young drivers (0.9 percent) when involved in a collision. Age comparisons of aggressive driving incidence rates exhibit a U-shaped distribution. Young drivers (under age 21) and older drivers (at or above age 75) exhibit the highest incidence of aggressive driving behavior as a percentage of the collisions for those age groups (Figure 3).

⁸An urban locality collision is one that occurred within the incorporated limits of a city.

⁹Shinar, D. & Compton, R. (2004). Aggressive driving: an observational study of driver, vehicle, and situational variables. *Accident Analysis and Prevention*, 36, 429-437.

¹⁰Krahe', B. & Fenske, I. (2002). Predicting aggressive driving behavior: The role of macho personality, age, and power of car. *Aggressive Behavior*, 28, 21-29.

¹¹Shinar & Compton (2004)

Restraint use

The effects of restraint use in relation to collisions involving aggressive driving follow expected patterns. As shown in Table 4, among unrestrained vehicle occupants, eight percent of those people in a vehicle with an aggressive driver were killed, compared to 5.6 percent of unrestrained vehicle occupants with a non-aggressive driver. Among restrained vehicle occupants, 1.1 percent of those in a vehicle with an aggressive driver were killed, compared to 0.8 percent of restrained vehicle occupants with a non-aggressive driver. Occupants killed in vehicles with an aggressive driver were over seven times more likely to have been unrestrained.

Alcohol

In 2007, 22 drivers involved in collisions who were driving aggressively had a positive blood alcohol concentration (BAC) level (Table 5). Of those, 50 percent were above the legal BAC limit of 0.08 grams per deciliter (g/dL). Approximately 0.4 percent (11 of 2,816) of all aggressive drivers in collisions with injuries had a BAC greater than or equal to 0.08 g/dL, compared to 1.3 percent (4,006 of 309,904) for non-aggressive drivers.

Geographic distribution of aggressive driving and speed-related collisions

Maps 1 and 2 show Indiana county aggressive driving involvement and speed-related collision rate percentiles. The maps are interpreted as follows: a county in the 25th percentile category means that at least 25 percent of all other counties have a collision rate less than that county. Several counties in the lower percentile of rates for aggressive driving—Carroll, Cass, Wabash, Franklin, Jefferson—were in the higher percentiles for speed-related collision rates, suggesting

that factors other than “unsafe speed” (a factor common to both aggressive driving and speed-related definitions) are defining speed-related collisions in these counties. Five counties—Carroll, Union, Franklin, Ohio, Pike—reported no aggressive driving collisions in 2007. All counties reported speed-related collisions in 2007.

Table 4: Safety restraint use among injured vehicle occupants, by aggressive driving (AD) involvement, 2007

Occupants, by restraint use	Occupant Injury Status				
	Fatal	% Total injuries	Non-fatal	% Total injuries	Total injuries
Not restrained	390	5.6%	6,581	94.4%	6,971
In AD vehicle	8	8.0%	92	92.0%	100
In non AD vehicle	382	5.6%	6,489	94.4%	6,871
Relative risk		1.44		0.97	
Restrained	334	0.8%	40,508	99.2%	40,842
In AD vehicle	5	1.1%	438	98.9%	443
In non AD vehicle	329	0.8%	40,070	99.2%	40,399
Relative risk		1.39		1.00	
Overall relative risk		6.84		0.95	
In AD vehicle		7.09		0.93	
In non AD vehicle		6.83		0.95	

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

Notes: Counts include only occupants with a known safety equipment type

Non-fatal injury includes incapacitating, non-incapacitating, and possible injuries

Relative risk=ratio of percentage of In Non AD Vehicle to percentage of In AD Vehicle.

Overall Relative risk=ratio of percentage not restrained to percentage restrained.

Table 5: Drivers and injuries to vehicle occupants in Indiana collisions, by aggressive driving (AD) status and blood alcohol concentration (BAC) results, 2007

Driver status	Count of drivers	Injuries in Vehicle		
		Fatal	Incapacitating	Non-incapacitating
Aggressive driver	2,816	14	60	505
No BAC reported	2,749	7	53	483
g/dL = 0.00	45	6	6	12
g/dL > 0.00	22	1	1	10
0.00 < g/dL < 0.08	11	0	1	6
0.08 <= g/dL < 0.15	0	0	0	0
0.15 <= g/dL < 0.60	10	1	0	4
g/dL >= 0.60	1	0	0	0
Non-aggressive driver	309,904	813	3,296	46,004
No BAC reported	302,271	316	3,041	43,920
g/dL = 0.00	2,477	302	152	799
g/dL > 0.00	5,156	195	103	1,285
0.00 < g/dL < 0.08	1,150	27	16	318
0.08 <= g/dL < 0.15	1,508	44	33	393
0.15 <= g/dL < 0.60	2,490	123	54	571
g/dL >= 0.60	8	1	0	3

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

Notes: Non-incapacitating includes non-incapacitating, and possible injuries

Map 1: Aggressive driving collisions (AD)

Rate Percentile

- No AD collisions
- 25th Percentile (AD, 1.03; SPD, 14.00)
- 50th Percentile (AD, 1.83; SPD, 18.58)
- 75th Percentile (AD, 2.95; SPD, 26.31)
- > 75th Percentile

Legend:

- (1) 100 or less
- (2) 100-200
- (3) 200-300
- (4) 300-400
- (5) 400 or more

Map showing population density by county in Illinois, 1990. The map displays the distribution of population across the state, with higher densities concentrated in the central and eastern regions, particularly around the Chicago metropolitan area and in the central corridor.

Notes: Includes only records with a valid county

Median is the value that divides the observations (i.e., collision rates) so that one-half are less than or equal to the median and one-half are greater than or equal to it.

Speeding

Indiana Code (9-21-5-1) addresses speeding, stating:

A person may not drive a vehicle on a highway at a speed greater than is reasonable and prudent under the conditions, having regard to the actual and potential hazards then existing. Speed shall be restricted as necessary to avoid colliding with a person, vehicle, or other conveyance on, near, or entering a highway in compliance with legal requirements and with the duty of all persons to use due care.¹²

For purposes of this fact sheet, a collision is defined as speed-related if the reporting officer marks either (a) *Speed too fast for weather conditions* or (b) *Unsafe speed* as a primary or contributing circumstance to the collision, or (c) a vehicle driver was issued a speeding citation.

General trends in speed-related collisions

In 2007, speed-related collisions accounted for nine percent of all collisions (Table 6). Though the percent of speed-related col-

lisions that were fatal decreased from 2006 to 2007 (1.1 to 0.9 percent), speed-related collisions continue to make up a large proportion of all fatal collisions as one in five fatal collisions in 2007 were speed-related. In 2007, 40,125 individuals were involved in 18,487 speed-related collisions, comprised of 26,228 drivers, 13,800 non-driver vehicle occupants, 84 pedestrians, and 13 pedalcyclists (not shown).

About half of all speed-related collisions were single vehicle collisions (Table 7). From 2003 to 2007, single vehicle speed-related crashes increased on average by 3.1 percent each year. In urban localities speed-related crashes increased an average of 4.2 percent each year, while on interstates they increased an average of 6.8 percent each year. Fatal speed-related collisions decreased on average by 0.5 percent each year, compared to a 1.7 increase for speed-related collisions overall. Fatal speed-related collisions in urban localities increased on average 4.3 percent each year; on interstates and U.S. routes they decreased on average 6.8 percent and 14.8 percent, respectively, each year.

Table 6: Indiana total collisions and speed-related collisions, 2003-2007

Year	All collisions		Speed-related collisions		Fatal speed-related collisions		
	Total	Fatal	Total	% of all collisions	Total	% of speed-related collisions	% of all fatal collisions
2003	211,731	753	18,680	8.8%	175	0.9%	23.2%
2004	208,682	857	18,812	9.0%	177	0.9%	20.7%
2005	208,359	855	20,010	9.6%	203	1.0%	23.7%
2006	192,721	817	14,570	7.6%	159	1.1%	19.5%
2007	204,943	803	18,487	9.0%	165	0.9%	20.5%

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

Table 7: Speed-related collisions in Indiana, 2003-2007

	2003		2004		2005		2006		2007		Average Annual Change	
	Total	Fatal	Total	Fatal	Total	Fatal	Total	Fatal	Total	Fatal	Total	Fatal
Total collisions	18,680	175	18,812	177	20,010	203	14,570	159	18,487	165	1.7%	-0.5%
Single vehicle	9,261	109	9,071	110	10,140	126	7,278	104	9,540	100	3.1%	-1.5%
Multiple vehicle	9,404	66	9,724	67	9,844	77	7,281	55	8,944	65	0.4%	1.5%
Unknown/Other	15	0	17	0	26	0	11	0	3	0	-16.0%	n/a
Rural locality	10,170	130	10,132	118	11,204	156	7,658	109	9,197	115	-0.3%	-0.4%
Urban locality	8,425	45	8,660	59	8,773	47	6,896	50	9,261	50	4.2%	4.3%
Unknown locality	85	0	20	0	33	0	16	0	29	0	4.6%	n/a
Local/city road	6,535	36	6,978	48	7,065	41	5,279	35	6,728	40	2.5%	4.6%
County road	4,817	61	4,701	59	5,178	72	3,200	52	3,959	66	-1.7%	4.5%
Interstate	2,596	29	2,383	22	2,642	27	2,113	20	3,057	20	6.8%	-6.8%
State road	2,313	28	2,210	26	2,393	43	2,000	34	2,245	28	-0.1%	4.9%
US route	1,459	20	1,678	22	1,713	20	1,301	18	1,616	9	4.3%	-14.8%
Unknown road class	960	1	862	0	1,019	0	677	0	882	2	1.2%	n/a

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

Note: An urban locality collision is one that occurred within the incorporated limits of a city.

¹²Indiana law defines speed limits for road classes, vehicle types, and localities and specifies when drivers should reduce speed, such as when (1) approaching and crossing an intersection, (2) approaching and going around a road curve, (3) approaching a hill crest, (4) traveling upon a narrow or winding roadway, or (5) when a special hazard exists with respect to pedestrians or other traffic or by reason of weather or highway conditions (IC 9-21-5-4). The state or local jurisdiction may also declare a minimum speed limit for safe operation as necessary (IC 9-21-5-8).

Table 8: Speed related collisions and injuries, by primary factor and speed citation status, 2007

Category	By Primary Factor							
	All speed related		Speed too fast for weather conditions		Unsafe speed		Other primary factor	
	Total	Speed citation issued	Total	Speed citation issued	Total	Speed citation issued	Total	Speed citation issued
Collisions	18,487	2,107	8,646	554	5,252	802	4,589	751
Fatal	165	11	22	2	74	6	69	3
Incapacitating	459	87	96	9	197	35	166	43
Non-incapacitating	3,917	621	1,416	120	1,372	270	1,129	231
Property damage only	13,946	1,388	7,112	423	3,609	491	3,225	474
Injuries in collisions	6,585	1,145	2,063	198	2,432	508	2,090	439
Fatal	187	12	25	2	83	7	79	3
Incapacitating	559	104	110	11	242	42	207	51
Non-incapacitating	5,839	1,029	1,928	185	2,107	459	1,804	385

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

Notes: Collisions in the other primary factor category include those where one or both of *speed too fast for weather conditions* or *unsafe speed* were selected as contributing factors (rather than primary factors) in the collision and/or a driver was issued a speeding citation.

Non-incapacitating includes *non-incapacitating* and *possible injuries*.

When categorized by the three criteria that define a collision as speed-related, the most common contributing circumstance in 2007 was *speed too fast for weather conditions* which comprised 47 percent of speed-related collisions (Table 8). Six percent of these collisions resulted in the issuance of a speeding citation. Twenty-eight percent of speed-related collisions were listed with *unsafe speed* as the primary factor; among these collisions, 15 percent resulted in speeding citations. The remaining 25 percent of speed-related collisions had some other circumstance listed as the primary factor, but included at least one vehicle that was speeding.

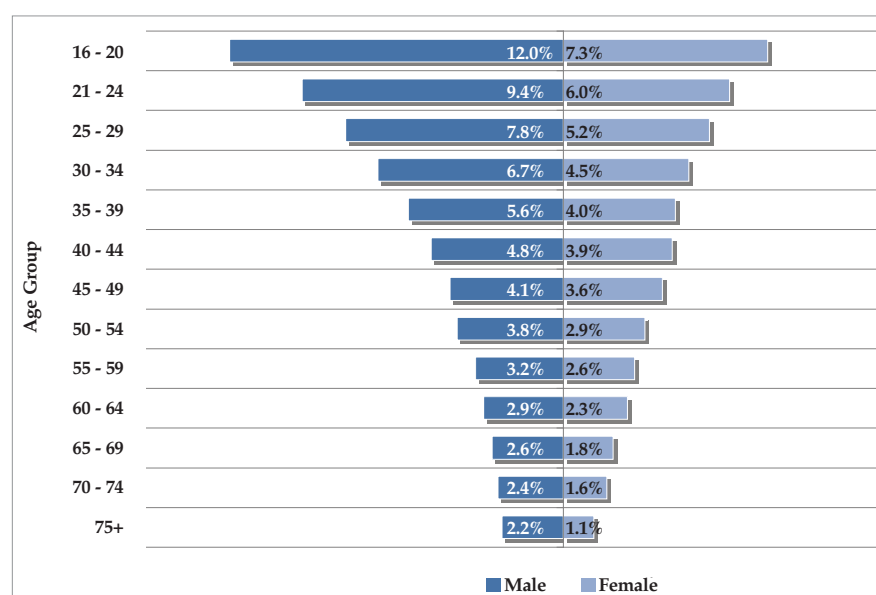
Drivers involved in speed-related collisions

In 2007, 11,525 male and 6,056 female drivers involved in collisions were speeding.¹³ Figure 4 shows the percent of drivers who were speeding within male and female age groups involved in crashes. The percent of drivers speeding declined with age, but for all age groups the percent of male drivers speeding was larger than the corresponding percent for females. Of the male 16-20 year old driver age group, 31.9 percent were speeding in fatal speed-related collisions, compared to 21.1 percent of females (not shown).

Alcohol involvement

Among speeding collisions, 3.6 percent of all drivers (634 of 17,628) had a positive BAC test result. This proportion was over twice that of drivers in collisions who were not speeding (1.5 percent or 4,544 of 295,092). In 2007, 265 speeding drivers had a BAC roughly twice the legal limit of 0.08 g/dL. Injuries in these drivers' vehicles included 34 fatalities and 84 other known injuries (Table 9).

Figure 4: Proportion of drivers who were speeding in Indiana collisions, by age group and gender, 2007



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

¹³There were 47 instances of a driver with an unknown or unreported gender from the Indiana Crash Report.

Table 9: Drivers and injuries to vehicle occupants in Indiana collisions, by speeding status and blood alcohol content (BAC), 2007

Driver status	Count of drivers	Injuries in Vehicle		
		Fatal	Incapacitating	Non-incapacitating
Speeding	17,628	152	433	3,971
No BAC reported	16,714	52	389	3,621
g/dL = 0.00	280	45	24	123
0.01 <= g/dL < 0.08	172	8	4	73
0.08 <= g/dL < 0.15	196	13	6	80
0.15 <= g/dL < 0.60	265	34	10	74
g/dL >= 0.60	1	0	0	0
% 0.08 g/dL and above	2.6%	30.9%	3.7%	3.9%
% BAC > 0	3.6%	36.2%	4.6%	5.7%
Not speeding	295,092	675	2,923	42,538
No BAC reported	288,306	271	2,705	40,782
g/dL = 0.00	2,242	263	134	688
0.01 <= g/dL < 0.08	989	19	13	251
0.08 <= g/dL < 0.15	1,312	31	27	313
0.15 <= g/dL < 0.60	2,235	90	44	501
g/dL >= 0.60	8	1	0	3
% 0.08 g/dL and above	1.2%	18.1%	2.4%	1.9%
% BAC > 0	1.5%	20.9%	2.9%	2.5%

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

Notes: Non-incapacitating includes non-incapacitating, and possible injuries

Time of day is a strong predictor of alcohol involvement in both speed and non-speed related collisions. In 2007, 26 percent of speed-related collisions from 12:00am to 2:59am involved alcohol, as did 15.8 percent during late night hours from 9:00pm to 11:59pm (not shown). For all time blocks, a greater percentage of speed-related collisions were alcohol involved, as compared to non-speed-related collisions.

miles per hour (mph) (Table 10). About half (131 of 259) of vehicles involved in fatal speed-related collisions and 68 percent (19,503 of 28,862) of vehicles in non-fatal speed-related collisions were in areas where the posted speed limit was less than 55mph.

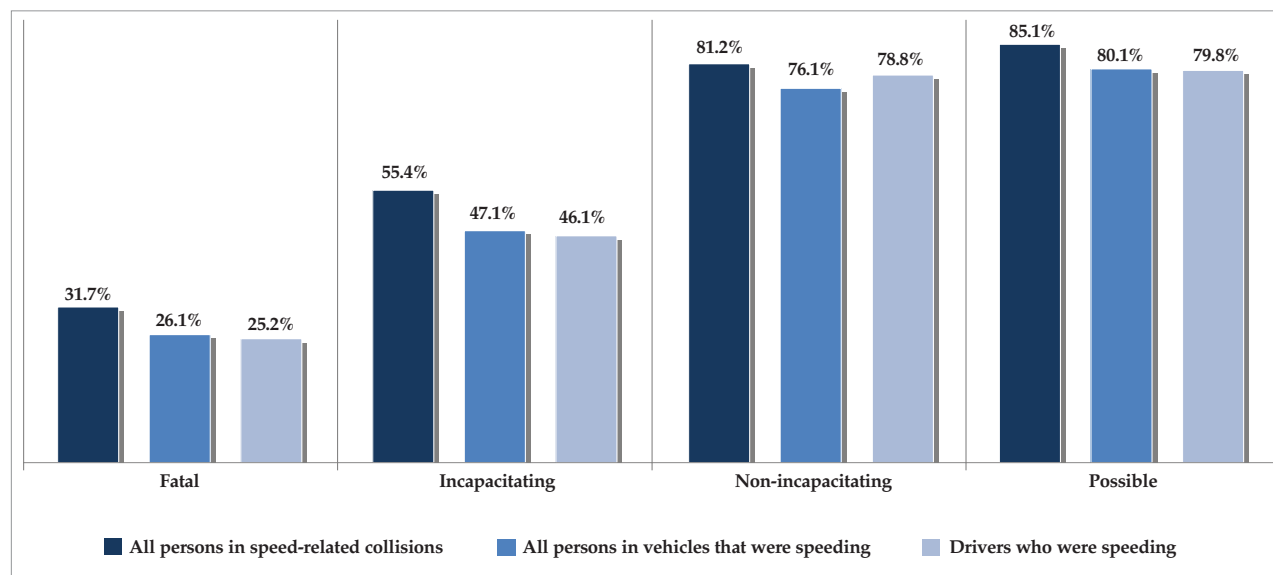
Restraint use

As the severity of injury increases in speed-related collisions, the percentage of individuals properly restrained decreases (Figure 5). Nearly 32 percent of all persons fatally injured in speed-related crashes were known to be properly restrained, compared to 85.1 percent of those with possible injuries. These numbers decrease when looking at drivers who were speeding and persons in vehicles that were speeding.

Speed limits

In 2007, 67 percent of the vehicles involved in speed-related collisions (19,634 of 29,121) were in areas where the posted speed limit was less than 55

Figure 5: Proportion of individuals in speed related collisions who were restrained, by injury status, 2007



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

Notes: Non-incapacitating includes non-incapacitating and possible injuries.

Speed limit enforcement

According to the Insurance Institute for Highway Safety, two primary methods are used to enforce speed limits.¹⁴ The most familiar involves police officers monitoring vehicle speeds and then stopping and citing those drivers deemed to have been speeding. The other method, automated speed enforcement (ASE), uses photo radar technology to identify speeding vehicles replacing police officers with speed cameras. Vehicle speeds are determined by radar guns often positioned at fixed locations and vehicles travelling faster than a set speed are photographed. A citation can then be mailed to either the registered owner of the vehicle or the driver if identifiable. Indiana is one of 25 states without state automated enforcement laws and one of 37 states without speed camera programs.¹⁵

Studies have shown speed camera enforcement to be effective. A recent report published by the National Highway Traffic Safety Administration (NHTSA) reviewed 13 studies of automated speed enforcement programs; all reported reductions in

collisions as a result of the programs. The report concluded that research on ASE programs indicates that these programs “are likely to result in aggregate safety improvements at high crash locations” (p. 43) but the magnitude of the improvements is unclear based on the research given various issues with the studies methodologies.¹⁶

Table 10: Indiana vehicles involved in fatal and non-fatal speed-related collisions by speed limit, 2007

Posted speed limit	Vehicles in all speeding collisions		Vehicles in fatal speeding collisions		Vehicles in non-fatal speeding collisions	
	Count	% All speeds	Count	% All speeds	Count	% All speeds
All speeds	29,121	100.0%	259	100.0%	28,862	100.0%
<35 mph	8,799	30.2%	31	12.0%	8,768	30.4%
35 mph	3,923	13.5%	41	15.8%	3,882	13.5%
40 mph	2,659	9.1%	12	4.6%	2,647	9.2%
45 mph	3,137	10.8%	37	14.3%	3,100	10.7%
50 mph	1,116	3.8%	10	3.9%	1,106	3.8%
55 mph	5,824	20.0%	74	28.6%	5,750	19.9%
60 mph	352	1.2%	7	2.7%	345	1.2%
65 mph	963	3.3%	14	5.4%	949	3.3%
70 mph	1,374	4.7%	24	9.3%	1,350	4.7%
Unknown	974	3.3%	9	3.5%	965	3.3%

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

Notes: Speed limits are not always reported as multiples of 5 (e.g., 35, 40, etc.). In these cases, speed limits were assigned to the next lowest multiple of 5.

Non-fatal includes vehicles involved in collisions where the injury severity of the collision was incapacitating, non-incapacitating or property damage only

¹⁴Insurance Institute for Highway Safety. *Q&As: Speed – law enforcement*, January 2008. Retrieved April 15, 2008, from http://www.iihs.org/research/qanda/speed_lawenf.html#cite15

¹⁵Insurance Institute for Highway Safety. *Automated Enforcement Laws*, April 2008. Retrieved April 15, 2008, from http://www.iihs.org/laws/automated_enforcement.aspx

¹⁶National Highway Traffic Safety Administration. *Automated Enforcement: A Compendium of Worldwide Evaluations of Results*, September 2007. DOT HS 810 763.

Summary

Collisions involving aggressive driving have decreased an average of 12.1 percent from 2003 to 2007 while speed-related collisions have increased 1.7 percent. However, fatal aggressive driving collisions have increased an average of 6.4 percent during the same period and fatal speed-related collisions have decreased 0.5 percent. In 2007, one of every 145 aggressive driving collisions and one of every 122 speed-related collisions were fatal. These figures indicate that aggressive driving and speeding continue to be a traffic safety issue.

Indiana has identified dangerous driving as one of five key target areas to be addressed in its fiscal year 2008 Highway Safety Plan.¹⁷ Based on the plan, \$1.72 million has been allocated to support overtime for officers who will patrol areas prone to dangerous driving and to aid counties with above average crashes and injuries involving dangerous driving. The stated

goals of these efforts are to reduce the percentage of speed-related collisions and speed-related traffic fatalities by one and 4.7 percent respectively by 2008 and an additional 0.7 and 1.8 percent respectively by 2010.

Automated speed enforcement technology is currently being used to address speeding in many other states and could be similarly applied to monitoring for aggressive driving. Other behavioral modification and environmental design strategies have also been proposed to reduce these types of driving including urging the use of alternative routes during periods of traffic congestion, promoting car pools, maximizing road capacity through land change directions, and allowing the use of shoulders during rush hour times.¹⁸ In the end a combination of these strategies will likely be needed as traffic safety officials attempt to “design out” aggressive driving and speeding opportunities while also altering individual behaviors associated with aggressive driving and speeding.

¹⁷Indiana Criminal Justice Institute, Traffic Safety Division. *FFY 2008, State of Indiana Highway Safety Plan*.

¹⁸Shinar & Compton (2004)



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

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

The Indiana Criminal Justice Institute (ICJI)

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

The Governor's Council on Impaired & Dangerous Driving

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

Indiana University Public Policy Institute

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

The Center for Criminal Justice Research (CCJR)

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

The National Highway Traffic Safety Administration (NHTSA)

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

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