

# INDIANA 2009 TRAFFIC SAFETY FACTS

May 2009

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 2008 vehicle crash data from the Automated Reporting Information Exchange System (ARIES), maintained by the Indiana State Police. This marks the third year of this partnership. Research findings will be summarized in a series of Fact Sheets on various aspects of traffic collisions, including alcohol-related crashes, light and large trucks, dangerous driving, children, motorcycles, occupant protection, and drivers. An additional publication will provide information on county and municipality data and the final publication will be the annual Indiana Crash Fact Book. These publications serve as the analytical foundation of traffic safety program planning and design in Indiana.

Indiana collision data are obtained from Indiana Crash Reports, as completed by law enforcement officers. As of December 31, 2008, approximately 98 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.



## MOTORCYCLES 2008

In 2008, motorcycles and mopeds in Indiana were involved in 3,814 collisions, resulting in 133 fatalities (unless noted otherwise, *motorcycles* and *mopeds* are grouped together as motorcycles in this factsheet). Fatalities included 118 motorcycle operators, 12 motorcycle passengers, one driver and one passenger of another vehicle, and one pedestrian. This factsheet examines motorcycle collisions within Indiana, including fatality and injury rates among riders, alcohol-related collisions, helmet use, licensing statistics, primary factors in motorcycle collisions, and the geography of those collisions in the state. Indiana data are drawn from the Indiana State Police Automated Reporting Information Exchange System (ARIES), as of March 1, 2009.

### Overview of Indiana motorcycle collisions

The number of persons killed in motorcycle crashes in Indiana continued to increase in 2008 (Table 1). Motorcycle collisions accounted for 16.3 percent (133/814) of total Indiana traffic fatalities. Indiana motorcycle collisions per 10,000 registered motorcycles decreased over the 2007 to 2008 period, from 192.2 to 190.3. The fatality rate per 10,000 motorcycles also dipped slightly (6.8 to 6.6) from 2007 to 2008.

### Indiana motorcycle collisions, units, and individuals involved

In 2008, there were 3,814 collisions involving motorcycles in Indiana, a 7.3 percent increase from 2007 (calculated from Table 2). Single vehicle crashes accounted for 46.9 percent of all collisions. There were 125 fatal collisions; of these, 53 (42.4 percent) were single vehicle. Single motorcycle fatal collisions had the highest average annual growth rate (9.8 percent) from 2004 to 2008. In 2008, the probability that a given collision resulted in one or more fatalities was 3.3 percent. During the past five years, the likelihood of a motorcycle collision involving a fatality was greater when the motorcycle collided with some other vehicle.

Altogether in 2008, 3,907 motorcycles collided with 2,096 other vehicles (including 40 pedestrians and pedalcyclists). Table 3 classifies the vehicles by *unit severity*, meaning the most serious injury associated with a vehicle or the non-motorist. Among all vehicles, 125 had one or more fatalities on board. Overall, the number of motorcycles involved in crashes has grown at an average rate of 7.5 percent annually, slightly faster than other non-motorcycle vehicles (6.9 percent).

*The injury rate per 10,000 motorcycles registered to particular age groups was highest for operators aged 16 to 20 years (1,220.1).*

**Table 1: Indiana motorcycle and moped collisions, 2003-2008**

| Year | Motorcycle collisions | Motorcycles involved in fatal collisions | Fatal motorcycle collisions   |                |                  | Registered motorcycles | Per 10,000 registered motorcycles |                    |                 | Total traffic fatalities | Motorcycle percentage of total fatalities |
|------|-----------------------|--|-------------------------------|----------------|------------------|------------------------|-----------------------------------|--------------------|-----------------|--------------------------|---|
|      |                       |  | Persons killed in all unit(s) | Single vehicle | Multiple vehicle |                        | Indiana collisions                | Indiana fatalities | U.S. fatalities |                          |   |
| 2003 | 2,442                 | 78                                       | 78                            | 27             | 49               | 145,948                | 167.3                             | 5.3                | 6.9             | 833                      | 9.4%                                      |
| 2004 | 2,873                 | 105                                      | 109                           | 38             | 62               | 154,739                | 185.7                             | 7.0                | 7.0             | 947                      | 11.5%                                     |
| 2005 | 2,906                 | 114                                      | 113                           | 48             | 65               | 164,423                | 176.7                             | 6.9                | 7.3             | 938                      | 12.0%                                     |
| 2006 | 3,098                 | 113                                      | 109                           | 42             | 62               | 162,683                | 190.4                             | 6.7                | 7.4             | 899                      | 12.1%                                     |
| 2007 | 3,556                 | 121                                      | 125                           | 51             | 66               | 185,048                | 192.2                             | 6.8                | 7.4             | 896                      | 14.0%                                     |
| 2008 | 3,814                 | 128                                      | 133                           | 53             | 72               | 200,387                | 190.3                             | 6.6                | na              | 814                      | 16.3%                                     |

**Sources:**

- 1) Collision data  
Indiana State Police Automated Reporting Information Exchange System (ARIES), as of March 1, 2009.
  - 2) Registration Data  
Indiana Bureau of Motor Vehicles, as of April 1, 2009.
  - 3) U.S. rate per 10,000 Motorcycles: FARS encyclopedia, accessed April 5, 2009, at <http://www-fars.nhtsa.dot.gov/Trends/TrendsGeneral.aspx>.
- Note: *Persons killed* includes all fatalities resulting from motorcycle collisions (e.g., motorcyclists, car passengers, pedestrians, etc.).  
na = not available

**Table 2: Collisions involving motorcycles and mopeds, by collision severity, 2004-2008**

| Collision severity                    | 2004         | 2005         | 2006         | 2007         | 2008         | Average Annual Change |
|---------------------------------------|--------------|--------------|--------------|--------------|--------------|-----------------------|
| <b>All collisions</b>                 | <b>2,873</b> | <b>2,906</b> | <b>3,098</b> | <b>3,556</b> | <b>3,814</b> | <b>7.4%</b>           |
| Fatal                                 | 100          | 113          | 104          | 117          | 125          | 6.1%                  |
| Incapacitating                        | 399          | 379          | 440          | 525          | 462          | 4.6%                  |
| Non-incapacitating                    | 1,611        | 1,604        | 1,713        | 1,969        | 2,177        | 8.0%                  |
| Property damage only                  | 763          | 810          | 841          | 945          | 1,050        | 8.4%                  |
| <b>Single-vehicle collisions</b>      | <b>1,319</b> | <b>1,341</b> | <b>1,463</b> | <b>1,644</b> | <b>1,787</b> | <b>8.0%</b>           |
| Fatal                                 | 38           | 48           | 42           | 51           | 53           | 9.8%                  |
| Incapacitating                        | 174          | 193          | 243          | 286          | 240          | 9.6%                  |
| Non-incapacitating                    | 866          | 839          | 932          | 1,040        | 1,177        | 8.2%                  |
| Property damage only                  | 241          | 261          | 246          | 267          | 317          | 7.5%                  |
| <b>Multi-vehicle collisions</b>       | <b>1,554</b> | <b>1,565</b> | <b>1,635</b> | <b>1,912</b> | <b>2,027</b> | <b>7.0%</b>           |
| Fatal                                 | 62           | 65           | 62           | 66           | 72           | 3.9%                  |
| Incapacitating                        | 225          | 186          | 197          | 239          | 222          | 0.7%                  |
| Non-incapacitating                    | 745          | 765          | 781          | 929          | 1,000        | 7.8%                  |
| Property damage only                  | 522          | 549          | 595          | 678          | 733          | 8.9%                  |
| <b>Probability of fatal collision</b> |              |              |              |              |              |                       |
| All collisions                        | 3.5%         | 3.9%         | 3.4%         | 3.3%         | 3.3%         |                       |
| Single-vehicle collisions             | 2.9%         | 3.6%         | 2.9%         | 3.1%         | 3.0%         |                       |
| Multiple-vehicle collisions           | 4.0%         | 4.2%         | 3.8%         | 3.5%         | 3.6%         |                       |

Source: Indiana State Police Automated Reporting Information Exchange System (ARIES), as of March 1, 2009.

**Notes:**

*Non-incapacitating* includes *Possible* injuries.

**Table 3: Units involved in motorcycle and moped collisions and unit injury severity, by unit type, 2004-2008**

| Unit type x unit injury severity | 2004         | 2005         | 2006         | 2007         | 2008         | Average Annual Change |
|----------------------------------|--------------|--------------|--------------|--------------|--------------|-----------------------|
| <b>Motorcycle or moped</b>       | <b>2,938</b> | <b>2,965</b> | <b>3,163</b> | <b>3,656</b> | <b>3,907</b> | <b>7.5%</b>           |
| Fatal                            | 101          | 112          | 104          | 118          | 123          | 5.4%                  |
| Incapacitating                   | 399          | 378          | 437          | 523          | 461          | 4.5%                  |
| Non-incapacitating               | 1,619        | 1,606        | 1,720        | 1,973        | 2,198        | 8.1%                  |
| Property damage only             | 819          | 869          | 902          | 1,042        | 1,125        | 8.3%                  |
| <b>Other units</b>               | <b>1,616</b> | <b>1,645</b> | <b>1,696</b> | <b>1,970</b> | <b>2,096</b> | <b>6.9%</b>           |
| Fatal                            |              | 1            | 1            | 3            | 2            | --                    |
| Incapacitating                   | 6            | 6            | 11           | 11           | 8            | 14.0%                 |
| Non-incapacitating               | 111          | 107          | 113          | 125          | 106          | -0.6%                 |
| Property damage only             | 1,499        | 1,531        | 1,571        | 1,831        | 1,980        | 7.4%                  |
| <b>Grand Total</b>               | <b>4,554</b> | <b>4,610</b> | <b>4,859</b> | <b>5,626</b> | <b>6,003</b> | <b>7.3%</b>           |

Source: Indiana State Police Automated Reporting Information Exchange System (ARIES), as of March 1, 2009.

**Notes:**

*Other units* category includes 40 pedestrians and pedalcyclists.  
*Non-incapacitating* includes *possible* injuries.

There were 4,094 individuals on motorcycles involved in collisions in 2008, of which 130 were killed (Table 4). The number of individuals killed on motorcycles has increased at an average annual rate of 4.9 percent from 2004 to 2008. When collisions occur, the probability of a fatal injury to a motorcyclist has remained at 3.2 percent the last three years. The probability of incapacitating injuries was 12.2 percent in 2008. When Indiana motorcycle crashes occurred from 2004 to 2008, about three-quarters of motorcycle operators and 96 percent of motorcycle passengers suffered some form of injury.

**Age of motorcyclists**

In 2007 and 2008, motorcyclists age 40 to 49 years were most likely to incur a serious (fatal or incapacitating) injury (Figure 1). The second highest category in 2007 was 30 to 39 years, but in 2008, the 50 to 59 year old category was second highest, accounting for 20.1 percent of incapacitating and fatal injuries. The highest average annual growth rates in fatal and incapacitating injuries were in age groups over 50 (not shown in figure).

*In 2008, there were 3,814 collisions involving motorcycles in Indiana, a 7.3 percent increase from 2007.*

**Table 4: Table 4: Individuals on motorcycles and mopeds, by person type and injury status, 2004-2008**

| Person type & individual injury severity | 2004         | 2005         | 2006         | 2007         | 2008         | Average Annual Change |
|--|--------------|--------------|--------------|--------------|--------------|-----------------------|
| <b>Operator</b>                          | <b>2,821</b> | <b>2,813</b> | <b>3,008</b> | <b>3,468</b> | <b>3,718</b> | <b>7.3%</b>           |
| Fatal                                    | 95           | 110          | 97           | 113          | 118          | 6.2%                  |
| Incapacitating                           | 374          | 345          | 407          | 498          | 439          | 5.2%                  |
| Non-incapacitating                       | 1,587        | 1,578        | 1,698        | 1,938        | 2,162        | 8.2%                  |
| Other                                    | 131          | 156          | 83           | 54           | 36           | -24.0%                |
| Not injured                              | 634          | 624          | 723          | 865          | 963          | 11.3%                 |
| <b>Injured occupant</b>                  | <b>318</b>   | <b>283</b>   | <b>319</b>   | <b>335</b>   | <b>376</b>   | <b>4.7%</b>           |
| Fatal                                    | 13           | 2            | 11           | 9            | 12           | 95.1%                 |
| Incapacitating                           | 53           | 51           | 63           | 70           | 59           | 3.8%                  |
| Non-incapacitating                       | 243          | 216          | 237          | 238          | 288          | 5.0%                  |
| Other                                    | 7            | 6            | 2            | 1            | 2            | -7.7%                 |
| Not injured                              | 2            | 8            | 6            | 17           | 15           | 111.6%                |
| <b>All motorcyclists</b>                 | <b>3,139</b> | <b>3,096</b> | <b>3,327</b> | <b>3,803</b> | <b>4,094</b> | <b>7.0%</b>           |
| Fatal                                    | 108          | 112          | 108          | 122          | 130          | 4.9%                  |
| Incapacitating                           | 427          | 396          | 470          | 568          | 498          | 5.0%                  |
| Non-incapacitating                       | 1,830        | 1,794        | 1,935        | 2,176        | 2,450        | 7.7%                  |
| Other                                    | 138          | 162          | 85           | 55           | 38           | -24.1%                |
| Not injured                              | 636          | 632          | 729          | 882          | 978          | 11.6%                 |
| <b>Percent not injured and other</b>     | <b>24.7%</b> | <b>25.6%</b> | <b>24.5%</b> | <b>24.6%</b> | <b>24.8%</b> |                       |
| <b>Probability of injury status</b>      |              |              |              |              |              |                       |
| Fatal                                    | 3.4%         | 3.6%         | 3.2%         | 3.2%         | 3.2%         |                       |
| Incapacitating                           | 13.6%        | 12.8%        | 14.1%        | 14.9%        | 12.2%        |                       |

Source: Indiana State Police Automated Reporting Information Exchange System (ARIES), as of March 1, 2009.

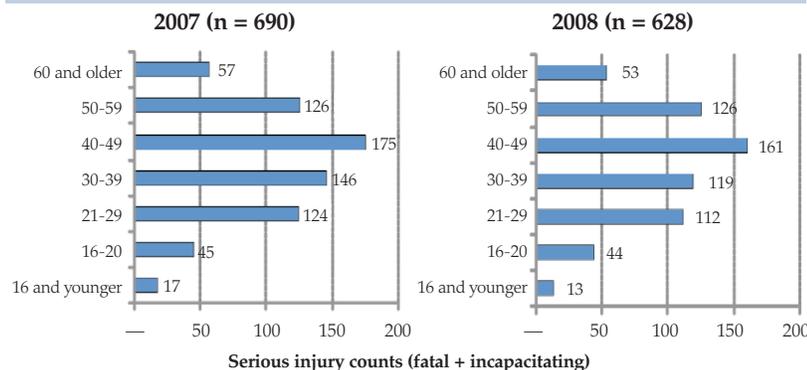
**Notes:**

Excludes non-motorcyclists.

Non-incapacitating includes possible injuries.

Other includes refused and unknown.

**Figure 1: Fatal and incapacitating injuries of motorcycle and moped riders by age, 2007-2008**



Source: Indiana State Police Automated Reporting Information Exchange System (ARIES), as of March 1, 2009.

**Note:**

Includes riders of motorcycles and mopeds, where age is known.

In 2008, nearly 23 percent of motorcycle operator fatalities had reported BAC levels of 0.08 g/dL or greater. This is compared to 2.1 percent of motorcycle operators in non-fatal collisions.

Figure 2 depicts all injuries to motorcycle operators in 2008. Consistent with previous years, motorcycle operators aged 40 to 49 years had the largest number of injuries (618). However, the injury rate per 10,000 motorcycles registered to particular age groups was highest for operators aged 16 to 20 years (1,220.1). Operators aged 21 to 29 years had the next highest rate (271.9). The rate per 10,000 motorcycle registrations declines with increasing age.

**Drivers license status of motorcycle operators in Indiana collisions**

Indiana requires a motorcycle license or endorsement for the operator of any motorized two-wheel vehicle that can be driven on public roadways at 25 miles per hour or more (see IC 9-21-11-12). In 2008, about one-half of all motorcycle and moped operators involved in crashes had some type of valid motorcycle license (Table 5). This percentage was only slightly better for operators involved in fatal crashes (51.2 percent). Generally, this percentage increased from 2004 to 2008.

Indiana data suggest a direct positive relationship between operator age and the likelihood of proper motorcycle licensing (Table 6). In 2008, about one-third of 16 to 20 year old operators in crashes had valid motorcycle permits, whereas more than half of operators 40 years of age and older had proper licenses.

**Use of helmets in motorcycle collisions**

From 2004 to 2008 in Indiana, the proportion of collision-involved motorcyclists (excluding moped riders) wearing helmets has not changed substantially (Table 7). Close to two-thirds of motorcycle riders involved and nearly three-fourths of riders killed in Indiana crashes in 2008 did not wear a helmet. Overall, helmet use is associated with lower probabilities of death or incapacitating injury in Indiana motorcycle collisions. The probability of fatal injuries for

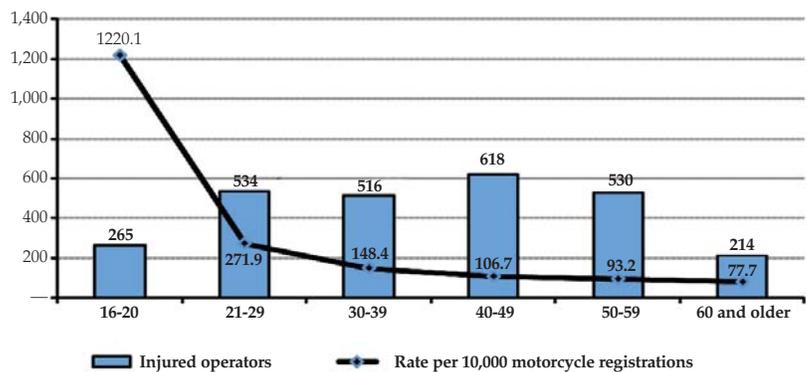
*Considering only fatal motorcycle collisions in Indiana, about 31 percent were alcohol-related in 2008, a decrease from the 35 percent rate of 2007.*

non-helmeted riders in 2008 (3.9 percent) was 1.4 times greater than helmeted riders (2.7 percent). In addition, slightly higher proportions of motorcyclists with helmets were reported as *not injured* compared to those without helmets in both 2007 and 2008. The percentage of helmeted motorcyclists reported uninjured increased from 2007 to 2008.

**Alcohol-related motorcycle collisions**

Considering all collisions involving motorcycles in Indiana, 10.7 percent in 2008 were classified as alcohol related (Table 8). It is important to emphasize that alcohol involvement does not necessarily imply causation of a collision. Alcohol was a factor in single-vehicle motorcycle crashes (15.4 percent) more than twice as frequently as multiple vehicle collisions (6.7 percent). (In single-vehicle collisions, motorcycles are the alcohol-related vehicle; in multi-vehicle collisions, the other vehicle could be alcohol

**Figure 2: Motorcycle operator injuries by age cohort, 2008**



Source: Indiana State Police Automated Reporting Information Exchange System (ARIES), as of March 1, 2009.

Registration data: Indiana Bureau of Motor Vehicles, as of April 1, 2009.

Note:

Includes motorcycle operators with valid age and motorcycle registration. N for 2008 = 2,667.

**Table 5: Driver's license status of Indiana motorcycle and moped operators involved in collisions by unit severity, 2004-2008**

| Count of motorcycle operators (where license status is known) | 2004         | 2005         | 2006         | 2007         | 2008         | Average Annual Change |
|---|--------------|--------------|--------------|--------------|--------------|-----------------------|
| <b>All collisions</b>   | <b>2,578</b> | <b>2,656</b> | <b>2,822</b> | <b>3,394</b> | <b>3,659</b> | <b>9.3%</b>           |
| Motorcycle licenses   | 747          | 876          | 1,151        | 1,638        | 1,861        | 26.1%                 |
| Other licenses  | 1,692        | 1,601        | 1,417        | 1,401        | 1,394        | -4.6%                 |
| Probationary or learners permit                               | 39           | 47           | 36           | 50           | 58           | 13.0%                 |
| No License  | 100          | 132          | 218          | 305          | 346          | 37.6%                 |
| <b>Fatal collisions (unit severity)</b>                       | <b>101</b>   | <b>109</b>   | <b>97</b>    | <b>117</b>   | <b>121</b>   | <b>5.2%</b>           |
| Motorcycle licenses   | 38           | 36           | 42           | 59           | 62           | 14.2%                 |
| Other licenses  | 57           | 68           | 51           | 51           | 47           | -3.4%                 |
| Probationary or learners permit                               |              | 2            | 1            | 1            | 4            | --                    |
| No License  | 6            | 3            | 3            | 6            | 8            | 20.8%                 |
| <b>Motorcycle licenses as percent of total</b>                |              |              |              |              |              |                       |
| All crashes   | 29.0%        | 33.0%        | 40.8%        | 48.3%        | 50.9%        |                       |
| Fatal crashes   | 37.6%        | 33.0%        | 43.3%        | 50.4%        | 51.2%        |                       |

Source: Indiana State Police Automated Reporting Information Exchange System (ARIES), as of March 1, 2009.

Notes:

Includes cases where license status is known.

Motorcycle licenses category includes motorcycle licenses, motorcycle endorsements, and motorcycle learner permits.

Other licenses include operator, chauffeur, commercial driver, and public passenger chauffeur.

Fatal collisions refer to the status of the motorcycle or moped unit.

**Table 6: Percentage of collision-involved motorcycle-moped operators with valid motorcycle licenses by age cohort, 2004-2008**

| Age category | 2004  | 2005  | 2006  | 2007  | 2008  | Average Annual Change |
|--------------|-------|-------|-------|-------|-------|-----------------------|
| 16-20        | 20.1% | 23.8% | 26.8% | 27.5% | 33.5% | 13.9%                 |
| 21-29        | 26.0% | 29.6% | 36.2% | 42.7% | 44.8% | 14.8%                 |
| 30-39        | 27.1% | 30.1% | 41.8% | 48.5% | 49.1% | 16.8%                 |
| 40-49        | 33.0% | 35.7% | 43.8% | 54.1% | 56.2% | 14.6%                 |
| 50-59        | 35.2% | 41.9% | 50.8% | 60.4% | 62.6% | 15.7%                 |
| 60 or older  | 37.2% | 47.6% | 49.5% | 62.1% | 65.3% | 15.6%                 |
| Total        | 28.9% | 33.0% | 40.8% | 48.3% | 50.9% | 15.4%                 |
| N            | 2,521 | 2,580 | 2,743 | 3,298 | 3,566 |                       |

Source: Indiana State Police Automated Reporting Information Exchange System (ARIES), as of March 1, 2009.

Notes:

N = count of all motorcycle or moped operators involved in collisions, where valid age and license status were reported.

Average Annual Change reflects change in percentage of motorcycle licenses.

**Table 7: Injury status of individuals on motorcycles (excluding mopeds) by helmet use and injury status, 2004-2008**

|  | Number of injuries |              |              |              |              | As percent of total |             |        |
|--|--------------------|--------------|--------------|--------------|--------------|---------------------|-------------|--------|
|  | 2004               | 2005         | 2006         | 2007         | 2008         | 2007                | 2008        | Change |
| <b>Operators and passengers</b>          |                    |              |              |              |              |                     |             |        |
| <b>Helmet use reported</b>               | <b>1,012</b>       | <b>866</b>   | <b>967</b>   | <b>995</b>   | <b>1,165</b> | <b>100%</b>         | <b>100%</b> |        |
| Fatal                                    | 27                 | 20           | 19           | 30           | 31           | 3.0%                | 2.7%        | -0.4%  |
| Incapacitating                           | 110                | 103          | 119          | 113          | 118          | 11.4%               | 10.1%       | -1.2%  |
| Non-incapacitating                       | 606                | 498          | 583          | 590          | 689          | 59.3%               | 59.1%       | -0.2%  |
| Other                                    | 47                 | 55           | 25           | 15           | 8            | 1.5%                | 0.7%        | -0.8%  |
| Not injured                              | 222                | 190          | 221          | 247          | 319          | 24.8%               | 27.4%       | 2.6%   |
| <b>No helmet use reported</b>            | <b>1,799</b>       | <b>1,871</b> | <b>1,827</b> | <b>2,176</b> | <b>2,137</b> | <b>100%</b>         | <b>100%</b> |        |
| Fatal                                    | 70                 | 83           | 77           | 85           | 83           | 3.9%                | 3.9%        | 0.0%   |
| Incapacitating                           | 280                | 254          | 289          | 373          | 292          | 17.1%               | 13.7%       | -3.5%  |
| Non-incapacitating                       | 1,012              | 1,059        | 994          | 1,175        | 1,252        | 54.0%               | 58.6%       | 4.6%   |
| Other                                    | 75                 | 91           | 46           | 30           | 18           | 1.4%                | 0.8%        | -0.5%  |
| Not injured                              | 362                | 384          | 421          | 513          | 492          | 23.6%               | 23.0%       | -0.6%  |
| <b>Percentage of no helmet reported:</b> |                    |              |              |              |              |                     |             |        |
| All crashes                              | 64.0%              | 68.4%        | 65.4%        | 68.6%        | 64.7%        |                     |             |        |
| Fatal crashes                            | 72.2%              | 80.6%        | 80.2%        | 73.9%        | 72.8%        |                     |             |        |

Source: Indiana State Police Automated Reporting Information Exchange System (ARIES), as of March 1, 2009.

**Notes:**

Mopeds are excluded from this analysis.

Non-incapacitating includes possible injuries.

**Table 8: Alcohol-related collisions involving motorcycles or mopeds, 2004-2008**

| Motorcycle or moped collisions                        | 2004         | 2005         | 2006         | 2007         | 2008         | Average Annual Change |
|---|--------------|--------------|--------------|--------------|--------------|-----------------------|
| <b>Single-vehicle</b>                                 | <b>1,319</b> | <b>1,341</b> | <b>1,463</b> | <b>1,644</b> | <b>1,787</b> | <b>8.0%</b>           |
| Alcohol-related                                       | 218          | 203          | 223          | 263          | 275          | 6.4%                  |
| Percent alcohol-related                               | 16.5%        | 15.1%        | 15.2%        | 16.0%        | 15.4%        | -1.6%                 |
| <b>Multiple-vehicle</b>                               | <b>1,554</b> | <b>1,565</b> | <b>1,635</b> | <b>1,912</b> | <b>2,027</b> | <b>7.0%</b>           |
| Alcohol-related                                       | 143          | 146          | 152          | 140          | 135          | -1.3%                 |
| Percent alcohol-related                               | 9.2%         | 9.3%         | 9.3%         | 7.3%         | 6.7%         | -7.3%                 |
| <b>All collisions</b>                                 | <b>2,873</b> | <b>2,906</b> | <b>3,098</b> | <b>3,556</b> | <b>3,814</b> | <b>7.4%</b>           |
| Alcohol-related                                       | 361          | 349          | 375          | 403          | 410          | 3.3%                  |
| Percent alcohol-related                               | 12.6%        | 12.0%        | 12.1%        | 11.3%        | 10.7%        | -3.8%                 |
| <b>Fatal collisions involving motorcycle or moped</b> |              |              |              |              |              |                       |
| <b>Single-vehicle</b>                                 | <b>38</b>    | <b>48</b>    | <b>42</b>    | <b>51</b>    | <b>53</b>    | <b>9.8%</b>           |
| Alcohol-related                                       | 19           | 22           | 21           | 24           | 25           | 7.4%                  |
| Percent alcohol-related                               | 50.0%        | 45.8%        | 50.0%        | 47.1%        | 47.2%        | -1.2%                 |
| <b>Multiple-vehicle</b>                               | <b>62</b>    | <b>65</b>    | <b>62</b>    | <b>66</b>    | <b>72</b>    | <b>3.9%</b>           |
| Alcohol-related                                       | 15           | 24           | 22           | 17           | 14           | 2.8%                  |
| Percent alcohol-related                               | 24.2%        | 36.9%        | 35.5%        | 25.8%        | 19.4%        | -0.8%                 |
| <b>All fatal collisions</b>                           | <b>100</b>   | <b>113</b>   | <b>104</b>   | <b>117</b>   | <b>125</b>   | <b>6.1%</b>           |
| Alcohol-related                                       | 34           | 46           | 43           | 41           | 39           | 4.8%                  |
| Percent alcohol-related                               | 34.0%        | 40.7%        | 41.3%        | 35.0%        | 31.2%        | -1.2%                 |

Source: Indiana State Police Automated Reporting Information Exchange System (ARIES), as of March 1, 2009.

**Notes:**

Alcohol-related crashes are defined based on information from the Indiana Officer's Standard Crash Report input to Indiana ARIES. A record is alcohol-related if any of the following conditions is met:

1. Primary factor = *Alcoholic beverages* OR
2. Contributing circumstance = *Alcoholic beverages* OR
3. BAC test result > 0 for driver or non-motorist OR
4. Apparent physical condition = *Had been drinking* for driver or non-motorist OR
5. OWI (operating while intoxicated) citation issued to driver.

Close to two-thirds of motorcycle riders involved and nearly three-fourths of riders killed in Indiana crashes in 2008 did not wear a helmet.

related.) Considering only fatal motorcycle collisions in Indiana, about 31 percent were alcohol-related in 2008, a decrease from the 35 percent rate of 2007.

In 2008, of the 118 fatalities among Indiana motorcycle operators, 36 (30.5 percent) were alcohol related (Table 9). From 2004 to 2008, the number of operators killed on alcohol-related motorcycles has increased annually an average of 8.3 percent. For 2008, the percent of individuals with fatal or incapacitating injuries was 2.4 times higher for alcohol-related motorcycles than for non-alcohol related motorcycles.

**Table 9: Motorcycle and moped operators on non-alcohol related and alcohol-related units, by individual injury status, 2004-2008**

| Operators by injury status                   | 2004         | 2005         | 2006         | 2007         | 2008         | Average Annual Change |
|--|--------------|--------------|--------------|--------------|--------------|-----------------------|
| <b>Non-alcohol-related units</b>             | <b>2,497</b> | <b>2,528</b> | <b>2,692</b> | <b>3,101</b> | <b>3,343</b> | <b>7.7%</b>           |
| Fatal  | 67           | 75           | 67           | 74           | 82           | 5.6%                  |
| Incapacitating                               | 315          | 287          | 342          | 414          | 356          | 4.3%                  |
| Nonincapacitating                            | 1,398        | 1,431        | 1,520        | 1,743        | 1,949        | 8.8%                  |
| Other  | 120          | 146          | 78           | 45           | 35           | -22.4%                |
| Not injured                                  | 597          | 589          | 685          | 825          | 921          | 11.8%                 |
| <b>Fatal + incapacitating percentage</b>     | <b>15.3%</b> | <b>14.3%</b> | <b>15.2%</b> | <b>15.7%</b> | <b>13.1%</b> | <b>-3.4%</b>          |
| <b>Alcohol-related units</b>                 | <b>324</b>   | <b>285</b>   | <b>316</b>   | <b>367</b>   | <b>375</b>   | <b>4.3%</b>           |
| Fatal  | 28           | 35           | 30           | 39           | 36           | 8.3%                  |
| Incapacitating                               | 59           | 58           | 65           | 84           | 83           | 9.6%                  |
| Nonincapacitating                            | 189          | 147          | 178          | 195          | 213          | 4.4%                  |
| Other  | 11           | 10           | 5            | 9            | 1            | -17.0%                |
| Not injured                                  | 37           | 35           | 38           | 40           | 42           | 3.4%                  |
| <b>Fatal + incapacitating percentage</b>     | <b>26.9%</b> | <b>32.6%</b> | <b>30.1%</b> | <b>33.5%</b> | <b>31.7%</b> | <b>5.0%</b>           |
| <b>Percent classified as alcohol-related</b> |              |              |              |              |              |                       |
| All motorcycle and moped operators           | 11.5%        | 10.1%        | 10.5%        | 10.6%        | 10.1%        | -3.0%                 |
| Fatalities                                   | 29.5%        | 31.8%        | 30.9%        | 34.5%        | 30.5%        | 1.3%                  |
| Incapacitating                               | 15.8%        | 16.8%        | 16.0%        | 16.9%        | 18.9%        | 4.8%                  |
| <b>Alcohol lethality ratio</b>               | <b>1.76</b>  | <b>2.28</b>  | <b>1.98</b>  | <b>2.13</b>  | <b>2.42</b>  |                       |

Source: Indiana State Police Automated Reporting Information Exchange System (ARIES), as of March 1, 2009.

**Notes:**

Alcohol lethality ratio calculated as the ratio of the alcohol-related fatal + incapacitating percentage to the non-alcohol related fatal + incapacitating percentage.  
 Nonincapacitating includes possible injuries.

**Table 10: Motorcycle and moped operators by blood alcohol content (BAC) range, in grams/deciliter (g/dL), 2004-2008**

| Operators by injury status       | 2004         | 2005         | 2006         | 2007         | 2008         |
|----------------------------------|--------------|--------------|--------------|--------------|--------------|
| <b>Injury status = Non-fatal</b> | <b>2,726</b> | <b>2,703</b> | <b>2,911</b> | <b>3,355</b> | <b>3,600</b> |
| Not reported or no test          | 2,546        | 2,584        | 2,757        | 3,224        | 3,436        |
| < 0.01                           | 36           | 26           | 41           | 32           | 51           |
| 0.01 < 0.08                      | 25           | 21           | 28           | 18           | 36           |
| 0.08 < 0.15                      | 36           | 30           | 34           | 38           | 44           |
| 0.15 < 0.60                      | 58           | 42           | 51           | 43           | 32           |
| 0.60 and greater                 | 25           | 0            | 0            | 0            | 1            |
| <b>Percent 0.08 and greater</b>  | <b>4.4%</b>  | <b>2.7%</b>  | <b>2.9%</b>  | <b>2.4%</b>  | <b>2.1%</b>  |
| <b>Percent greater than 0.00</b> | <b>5.3%</b>  | <b>3.4%</b>  | <b>3.9%</b>  | <b>3.0%</b>  | <b>3.1%</b>  |
| <b>Injury status = Fatal</b>     | <b>95</b>    | <b>110</b>   | <b>97</b>    | <b>113</b>   | <b>118</b>   |
| Not reported or no test          | 33           | 37           | 48           | 45           | 45           |
| < 0.01                           | 43           | 41           | 21           | 34           | 41           |
| 0.01 < 0.08                      | 5            | 6            | 5            | 5            | 5            |
| 0.08 < 0.15                      | 5            | 9            | 8            | 11           | 13           |
| 0.15 < 0.60                      | 8            | 17           | 15           | 18           | 14           |
| 0.60 and greater                 | 1            | 0            | 0            | 0            | 0            |
| <b>Percent 0.08 and greater</b>  | <b>14.7%</b> | <b>23.6%</b> | <b>23.7%</b> | <b>25.7%</b> | <b>22.9%</b> |
| <b>Percent greater than 0.01</b> | <b>20.0%</b> | <b>29.1%</b> | <b>28.9%</b> | <b>30.1%</b> | <b>27.1%</b> |

Source: Indiana State Police Automated Reporting Information Exchange System (ARIES), as of March 1, 2009.

**Notes:**

Indiana ARIES data produce reported BAC levels for motorcycle operators involved in crashes, although these estimates are subsequently re-estimated by NHTSA using imputation models, and ARIES fatality counts by BAC level are thus typically less than later federal estimates. NHTSA performs imputation routines to re-estimate state level alcohol involvement, which increases the federal estimates of the percentage of alcohol-related motorcycle fatalities. Information reported here is based only on non-imputed alcohol data included in the ARIES data extract as of March 1, 2009.

Table 10 shows the blood alcohol content (BAC) ranges (in grams per deciliter, or g/dL) for Indiana motorcycle operators involved in all crashes, and those involved in fatal crashes from 2004 to 2008. In 2008, nearly 23 percent of motorcycle operator fatalities had reported BAC levels of 0.08 g/dL or greater. This is compared to 2.1 percent of motorcycle operators in non-fatal collisions.

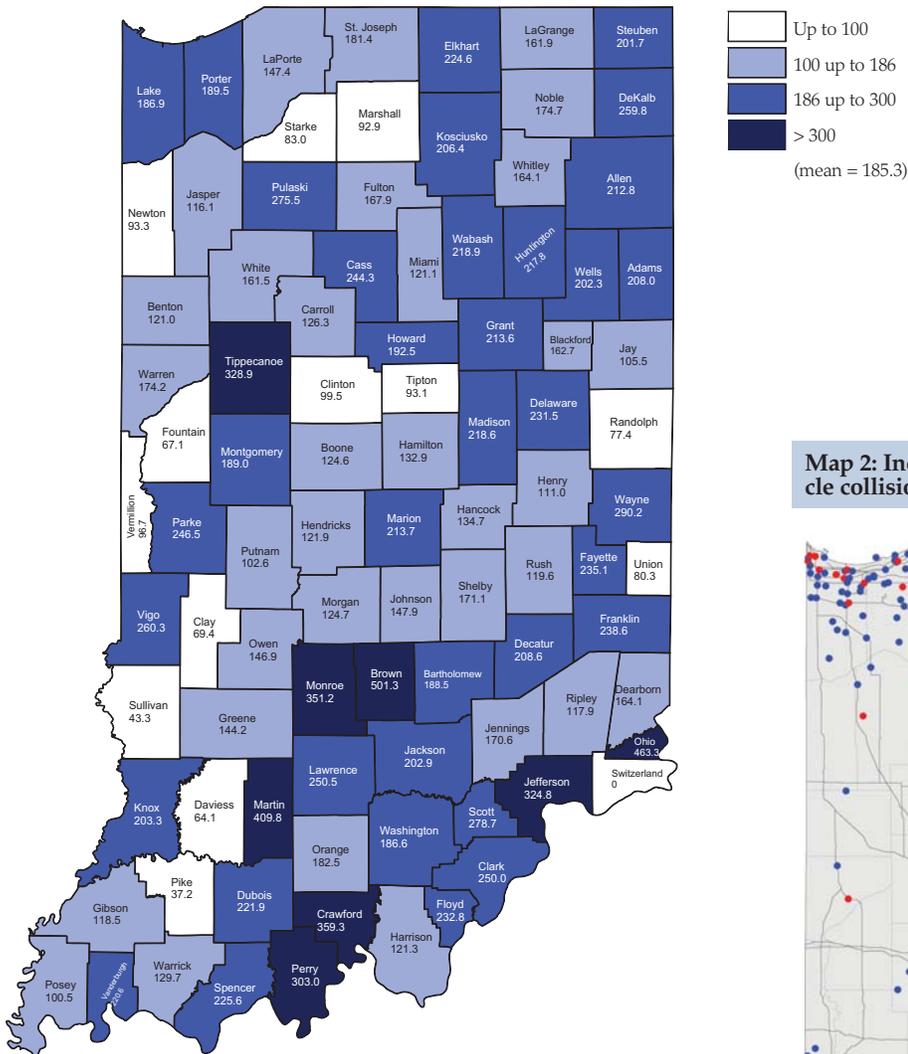
**Geography of motorcycle collisions**

Map 1 classifies Indiana counties by the number of collisions per 10,000 registered motorcycles in each county in 2008. In 2007, the average rate per county was 186.3 collisions per 10,000 registered motorcycles; the county average dropped slightly to 185.3 in 2008. Counties that attract more motorcyclists reflect higher rates; for example, scenic counties such as Brown, Martin, Jefferson, and Perry reflected some of the highest collision rates in 2008. Motorcyclist fatalities and incapacitating injuries were also concentrated in several areas, as shown in Map 2. These were generally areas of higher population densities (e.g., Gary, Fort Wayne, Indianapolis, Evansville).

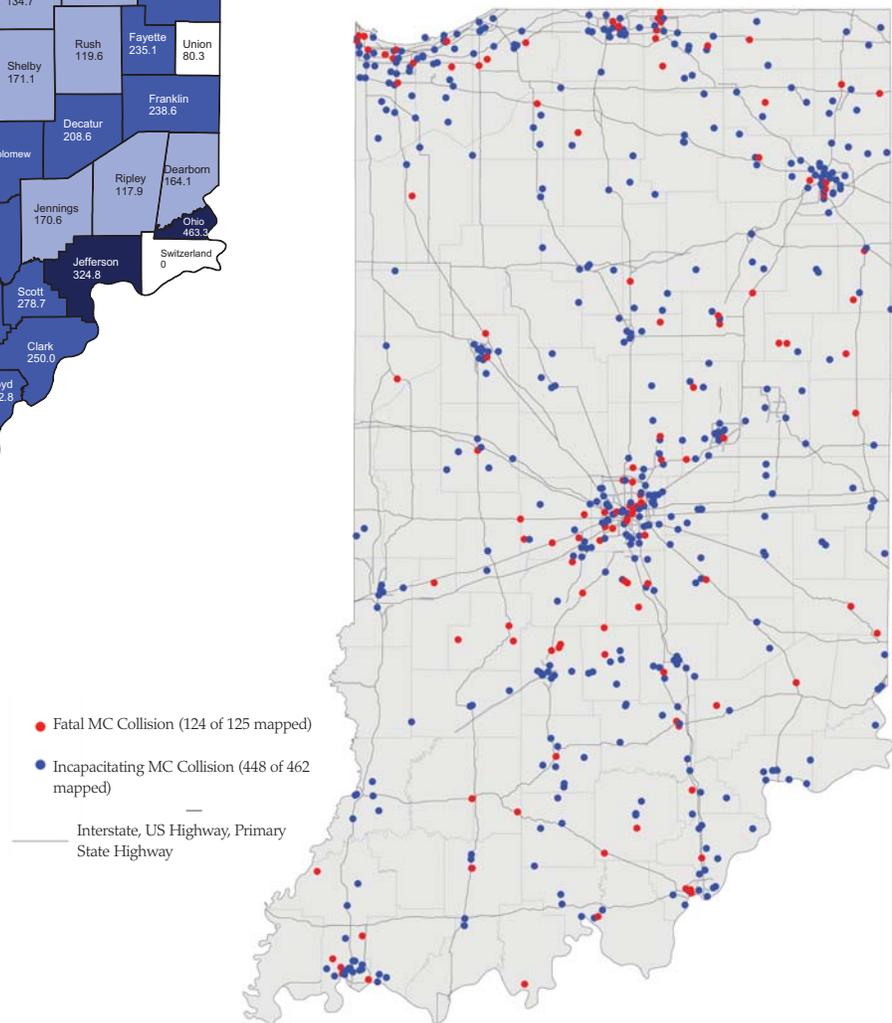
**Conclusions**

During 2008, individuals involved in Indiana motorcycle collisions are likely to be injured, with about a 3.2 percent chance of a fatal injury outcome. Operators involved in crashes were improperly licensed about 49 percent of the time, and were not wearing a helmet about 65 percent of the time. Motorcyclists wearing helmets had reduced probabilities of serious injuries. The potential for a fatal or incapacitating injury increases by a factor of more than 2 when a motorcycle collision was alcohol-related.

**Map 1: Indiana motorcycle collisions per 10,000 registered motorcycles, 2008**



**Map 2: Indiana fatal and incapacitating motorcycle collisions, 2008**



Sources: Indiana State Police Automated Reporting Information Exchange System (ARIES), as March 1, 2009 (crash data); Indiana Bureau of Motor Vehicles, 2008 (registration data).

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](http://www.criminaljustice.iupui.edu)), the ICJI website ([www.in.gov/cji/](http://www.in.gov/cji/)), or you may contact the Center for Criminal Justice Research at 317-261-3000.

### **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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