



TRANSPORTATION REVIEW

MOTORCYCLE SAFETY

by Anne Teigen

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Overview

The popularity of motorcycling has increased in the last few years; more than 1.1 million motorcycles were sold in 2006, according to the Motorcycle Industry Council. The popularity of this pastime has resulted in an increase in motorcyclist deaths in recent years, more than doubling between the all-time low in 1997 and 2005. In 2006, 4,810 motorcyclists were killed, up 5.6 percent from the 4,553 motorcyclist fatalities in 2005. In addition, 88,000 motorcyclists were injured in traffic crashes in 2006. Motorcycle rider fatalities accounted for 11 percent of total 2006 fatalities, exceeding the number of pedestrian fatalities for the first time since the National Highway Traffic Safety Administration began collecting fatal motor vehicle crash data in 1975.

To reduce the percentage of deaths and injuries from motorcycle crashes, the federal government and many states have established safety programs. These programs address the importance of using helmets, licensing correctly, educating riders and avoiding alcohol.

This report provides an overview of motorcycle safety, including federal regulations and guidelines, information about state policy and laws that address motorcycle safety, and the effectiveness of these laws.

Federal Action

From 1992 to 1995, as part of an incentive package for states to pass motorcycle helmet laws covering all riders, the Intermodal Surface Transportation Act (ISTEA) required states to pass motorcycle helmet laws that applied to all riders or to have funds transferred from highway construction accounts to highway safety accounts. The National Highway System Designation Act of 1995 repealed these sanctions. In 1997, Arkansas and Texas became the first states since 1983 to repeal laws requiring all motorcyclists to wear helmets. Under the universal law, helmet use was 97 percent in Arkansas and Texas. By May 1998, it had fallen to 52 percent in Arkansas and to 66 percent in Texas. Data from the Arkansas Emergency Medical Service and the Texas Trauma Registry showed an increase in motorcyclist head injuries; the cost per case of treating head injury also increased. Florida, which repealed its mandatory helmet law in 2000, has seen an increase in motorcycle fatalities. According to NHTSA, total motorcycle deaths in Florida increased by 67 percent, from 259 in 2000 to 432 in 2004.

On Aug. 10, 2005, President Bush signed into law the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). This legislation authorized \$286.4 billion in funding for highways, traffic safety and transit. Provisions in SAFETEA-LU also authorized a total of \$25 million for a Motorcyclist Safety Grant program for fiscal years 2006 through 2009.

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To qualify for funds under this program, a state must satisfy one of six criteria in FY 2006 and two of six criteria in fiscal years 2007, 2008 and 2009. The eligibility criteria are:

- Motorcycle rider training courses.
- Motorcycle awareness program.
- Reduction of fatalities and crashes involving motorcycles.
- Impaired driving program.
- Reduction of fatalities and accidents involving impaired motorcyclists.
- Fees collected from motorcyclists for training and safety programs used for motorcycle training and safety programs.

The grant funds under this program can be used for various activities, including improvements to motorcycle safety training, recruiting and retaining motorcycle safety instructors, and creating public awareness campaigns.

On Nov. 2, 2007, Secretary of Transportation Mary Peters unveiled a comprehensive federal initiative to improve motorcycle safety. The plan includes a broad public awareness campaign through fiscal year 2008 and:

- A Motorcycle Crash Causes and Outcomes Study, with a comprehensive examination of the factors that cause crashes, which will help the Department of Transportation develop stronger programs and strategies to combat the rising trends in motorcycle crashes.
- Development of National Standards for Entry Level Motorcycle Rider Training that will set the baseline for novice motorcycle rider training programs conducted in the United States.
- A plan to amend Federal Motor Vehicle Safety Standard (FMVSS) No. 218, Motorcycle Helmets, to address the falsification of helmet certifications facilitated by the current labeling requirements of the motorcycle helmet standard.
- Distributing “Roadway Safety for Motorcycles,” a brochure containing official guidance on designing, constructing and maintaining roadways for increased motorcycle safety, to road planners, designers and engineers.
- Creating a training program designed to educate police about motorcycle safety and the specific enforcement efforts they can undertake to reduce motorcycle crashes.
- Marketing a “Share the Road” campaign kit for use by states, local communities and motorcycle organizations.

NHTSA Guidelines: Helmets, Licensing and Education

NHTSA is the arm of the U.S. Department of Transportation (DOT) that is responsible for establishing guidelines and regulations regarding transportation safety. Motorcycle safety is one area in which NHTSA has established recommendations to reduce deaths and injuries caused by motorcycle crashes. NHTSA recommends the use of protective clothing, including helmets, when

motorcycling. Full-fingered gloves, long sleeves, long pants and over-the-ankle sturdy footwear also are suggested.

Helmets are by far the riders' most important safety equipment because they guard against injuries to the head and brain, according to NHTSA. All helmets sold in the United States must meet Federal Motor Vehicle Safety Standard No. 218. Helmets are estimated to effectively prevent 37 percent of fatal injuries and 67 percent of brain injuries to motorcyclists.

In the 2006 Uniform Guidelines for Highway Safety Programs, NHTSA stressed the importance of motorcycle licensing restrictions and rider education. The guidelines suggested that every state should require motorcycle operators to pass a motorcycle license examination, including a knowledge and skills test. They also suggest that states issue motorcycle license endorsements and cross-reference motorcycle registrations with motorcycle licenses to identify those riders who may not be properly licensed. The Uniform Guidelines also suggest that each state establish a state-funded motorcycle rider education program that uses a state-approved curriculum to teach riders how to be safe on the roadways.

NHTSA has developed materials to help law enforcement officers detect impaired motorcyclists. Together with rider organizations, it has created a public information and education campaign to explain the consequences of operating a motorcycle while under the influence. NHTSA also provides material on its website to educate law enforcement officers about how to detect impaired motorcyclists.

In September 2007, the National Transportation Safety Board (NTSB) organized a public meeting and released a safety alert on motorcycle safety. The goal of the forum was to issue a National Agenda For Motorcycle Safety, including safety recommendations to NHTSA, the Federal Highway Administration, and the 50 states. The NTSB recommended that the three states that do not have motorcycle helmet laws pass legislation requiring that all riders wear federal safety standard-compliant helmets while operating a motorcycle or riding as a passenger. The report also recommended that the 27 states that have helmet laws for only some riders amend their statutes to include all riders. Finally, the report charged the 50 states to provide information to NHTSA about the effectiveness of their motorcycle safety efforts in order to help NHTSA develop better safety programs and campaigns.

State Action

Helmet Laws

Twenty states, the District of Columbia and Puerto Rico require all riders to wear helmets. Illinois, Iowa and New Hampshire do not mandate helmet use for any rider. The remaining 27 states require that a specific segment of riders wear them, usually those under age 18. In 2007, 25 state legislatures considered ways to increase motorcycle safety. Colorado, a state that previously had no helmet law, passed a motorcycle helmet law that requires riders under age 18 to wear protective helmets. Adults age 18 and older still are allowed to ride in Colorado without a helmet. Opponents of the Colorado bill said it violated personal freedoms.

In 2006, Rhode Island introduced a universal helmet law that would require all riders to wear safety helmets. Five states—Delaware, Hawaii, Kansas, Montana and Oklahoma—considered legislation in 2007 that would have applied a universal helmet law to all riders instead of only those of a certain age.

Although some states are considering legislation that would require all motorcycle operators to wear helmets, others are considering legislation that would provide exceptions or completely repeal their universal helmet laws. California considered a bill in 2006 that would exempt motorcycle operators from wearing a helmet if they were over age 18 and had completed a rider training program. Maryland considered a similar bill in 2006, exempting riders over age 21 who have completed a safety course or riders who have been licensed to operate a motorcycle for more than two years.

In 2007, nine states that currently have universal helmet laws—Massachusetts, Mississippi, Nevada, New York, Oregon, Tennessee, Vermont, Virginia and Washington—considered legislation to have helmet laws apply only to riders of a certain age. Mississippi's bill would change the law to require only operators age 18 and younger to wear helmets. New York's proposed bill would require operators age 21 and younger to wear protective helmets.

Whether the states are attempting to expand their helmet laws to cover all riders or to limit their helmet laws to a certain age group, motorcycle helmet laws are continually being addressed by legislators.

Education and Licensing

Another area where state legislatures have grappled with the issue of motorcycle safety is through laws with specific licensing and education requirements. As of 2006, 47 states have state-funded motorcycle safety programs, and all states require a special endorsement to operate a motorcycle. Nearly all states provide a motorcycle operator learner's permit. These permits are valid for varying lengths of time, ranging from 60 days to two years. In most states, the learner's permit is accompanied with various restrictions, including supervised riding, knowledge and skills tests, times of operation, passenger restrictions, and mandatory helmet and eye protection use. Thirty-one state licensing agencies use one of the Motorcycle Safety Foundation's four model skills tests, and 29 states incorporate the MSF knowledge test into their licensing program.

One way to decrease the likelihood of a motorcycle crash is to ensure that the rider has learned the skills necessary to safely operate a motorcycle. During the 1980s, the Motorcycle Safety Foundation developed model legislation regarding state-funded motorcycle rider education programs. The foundation designed this model legislation as a tool for state legislators who are interested in motorcycle safety. Rider education programs provide basic lessons about how to operate motorcycles on streets and highways. Some states, such as Nebraska, require rider training for individuals under a certain age before they receive their learner's permit. In some states—such as Oregon, Georgia and South Dakota—the skills test required for licensing can be waived if the rider has successfully completed a rider training course.

Since many motorcycle accidents involve motor vehicle drivers, there is new interest in educating motorists about motorcycle safety. Wisconsin passed a measure in 2006 that requires driver's education classes to include information about motorcycle awareness.

A New Trend: High-Performance Motorcycles

The Insurance Institute for Highway Safety (IIHS) has identified the recent popularity of high-performance racing motorcycles, called "super-sports," as a traffic safety issue. These motorcycles are built for racing then modified for the highway and sold to consumers. They are lightweight and have powerful engines that can reach a top speed of 180 miles per hour. In 2005, these super-sports bikes made up less than 10 percent of registered motorcycles but accounted for more than 25 percent of rider deaths. The IIHS reported that, for operators who drive super-sports, the driver death rate per 10,000 registered motorcycles is almost four times higher than that for motorcyclists who ride all other types of motorcycles.



Super Sport motorcycle KAWASAKI NINJA ZX-10R
Photo Courtesy of IIHS

Their high horsepower and intense speed makes these models popular with younger riders. Among the fatally injured motorcycle operators in 2005, those on super-sports were the youngest, with an average age of 27. Speed was cited in 57 percent of super-sports riders' fatal crashes in 2005.

Evidence of Effectiveness

Helmets

NHTSA estimates that helmets saved 1,546 motorcyclists' lives in 2005, and that 728 more could have been saved if all motorcyclists had worn helmets. Helmets could reduce the likelihood of a motorcycle crash fatality by as much as 37 percent. Unfortunately, NHTSA also reports that helmet use declined by 23 percentage points, from 71 percent in 2000 to 48 percent in 2005.

Federal Motor Vehicle Safety Standard (FMVSS) No. 218 establishes minimum performance requirements for motorcycle helmets. FMVSS-compliant helmets are of a specific thickness and provide a certain amount of impact protection to riders. Helmets that meet or exceed the minimum requirements of FMVSS No. 218 have been shown to reduce deaths and injuries to motorcycle riders. The Insurance Institute for Highway Safety has reported that both overall helmet use and the use of FMVSS-certified helmets are down. In 2006, 68 percent of motorcyclists in states with universal laws were wearing certified helmets, down from 73 percent in 2002. In states that have no universal helmet law, use of certified helmets fell from 46 percent in 2002 to 37 percent in 2006.

Helmets that are not certified by a manufacturer to meet the minimum safety performance requirements of FMVSS No. 218 are called "novelty helmets." Motorcycle riders sometimes prefer novelty helmets because they are less bulky and look more sporty. A recent NHTSA report states that tests show novelty helmets perform significantly worse than certified helmets. Motorcyclists who wear novelty helmets are more likely to sustain fatal head injuries if, during the crash, the rider falls to the ground and his or her head contacts paved road. The NHTSA study determined that novelty helmets will not protect motorcycle riders during motorcycle crashes from either impact or penetration threats and likely will not stay on motorcycle riders' heads during crashes.

During a speech on Feb. 16, 2007, Secretary of Transportation Mary Peters said, “The time has come to make the helmet standard safety equipment.” The secretary stated that she encouraged helmet manufacturers to provide free or heavily discounted certified helmets with every new motorcycle sold in the United States. “We shouldn’t be letting any customer take a bike out of the store without a helmet as part of the package. Safety shouldn’t have to be an option when purchasing a motorcycle.”



Novelty Helmet



FMVSS No. 218 Certified Helmet

Photos courtesy of NHTSA

Safety advocates and motorcycle enthusiasts disagree about the effectiveness of helmet use laws. The American Motorcyclists Association and other rider groups argue that preventing accidents is critical to motorcycle safety and that mandatory helmet laws do nothing to reduce crashes. Instead, motorcycle safety training and driver education about motorcycles would be more effective, since automobile drivers cause many of the crashes. Motorcycle groups contend that helmet laws interfere with their freedom and assert that adults are capable of assessing risks and making their own decisions about wearing a helmet.

Education Programs

Some states attempt to improve motorcycle safety through a variety of programs designed to target dangerous motorcyclists. Illinois, for example, has a Cycle Rider Safety Training Program. It was established in 1976 after the Illinois Department of Transportation found that motorcycle ridership and the number of crashes and fatalities involving motorcycles both were increasing. Research in Illinois showed that most motorcyclists were riding without training and that more than 90 percent were self-taught. Through the Cycle Rider Safety Training Program, Illinois was able to educate 136,800 students between 1976 and 1996. Between 1976 and 1995, motorcycle crashes in Illinois decreased by more than 45 percent, and fatalities decreased by 57 percent.

Minnesota has experienced a similar success in its motorcycle safety program. The Minnesota Motorcycle Safety Program (MMSP), a state program created in 1983, takes a comprehensive approach to motorcycle safety by combining rider training, public information and education, research, and testing and licensing. Before MMSP was implemented in 1980, 121 motorcyclists died in crashes in Minnesota. In 1997, motorcycle fatalities reached a record low of 24. The MMSP is funded by Minnesota cyclists through the Motorcycle Safety Fund; money from instruction permits, license endorsements and renewals goes directly to the fund.

The American Motorcyclist Association believes that training and education programs for motorcyclists are good; however, they believe that states should not pass laws that require mandatory rider training programs. Instead, it recommends that states offer these training programs as a licensing incentive. In other words, if the motorcyclist completes a rider education course, then he or she immediately receives a license.

NHTSA and the Motorcycle Safety Foundation cooperatively funded a study to determine the effectiveness of motorcycle rider education and training courses. Field research began in early 2007, and the study will be completed by 2010. Rider knowledge, skills, attitudes and experiences will be evaluated and measured over time. The University of North Carolina Highway Safety Research Center will evaluate the research, which will examine the benefits of rider education participation and its subsequent effect on crash avoidance skills.

Alcohol

Several anti-drunk driving programs have been designed to inform the public about the hazards of drinking and driving, but few programs educate the public about the problem of riding a motorcycle under the influence. In Wisconsin, the rider education program has developed such a course. For real-life emphasis, the course illustrates the process a motorcyclist goes through when arrested for riding under the influence of drugs or alcohol.

In 2005, NHTSA helped Georgia develop a “Riders Helping Riders” program that educates motorcycle training instructors and enthusiasts about drunk riding. In an effort to help create a culture change in the motorcycling community, the program encourages riders to communicate with other riders about intoxicated riding. The Georgia Department of Driver Services includes “Riders Helping Riders” in all its motorcycle safety training programs. Georgia motorcycle safety instructors make presentations at club meetings, rallies, dealer events and other biker gatherings, focusing on how to discourage fellow riders from riding when they have been drinking.

The Motorcycle Safety Foundation includes a module on impaired driving in its basic rider education course. The module emphasizes the effects of alcohol on the rider, the ability to maintain control of the motorcycle while under the influence, and the consequences of riding under the influence.

Conclusion

Riding a motorcycle requires tremendous skill and awareness. Motorcycles can travel at high speeds and offer little rider protection. Motor vehicles weigh more, have greater stability, and include safety features such as seat belts and air bags. Motorcycle crashes are violent events; 80 percent of riders involved in a crash are either injured or killed.

Mandatory helmet laws increase the level of motorcycle safety and decrease deaths and injuries associated with motorcycle crashes. State laws requiring special endorsements to operate a motorcycle and mandatory rider education have helped to ensure that motorcyclists learn the skills necessary to safely operate a motorcycle. Through these programs, riders are educated about the effects of alcohol and the consequences of riding a motorcycle while impaired.

Resources

- American Motorcyclists Association
www.ama-cycle.org/
- Insurance Institute for Highway Safety
www.iihs.org/
- Minnesota Motorcycle Safety Center
www.motorcyclesafety.state.mn.us/latest/MMSCHome.asp?cid=2
- Motorcycle Riders' Foundation
www.mrf.org
- Motorcycle Safety Foundation
<http://online.msf-usa.org/Perspectives/Article.aspx?aid=x0SSTvuHdZsYvLXnK1IR6g%3D%3D>
www.msf-usa.org/
- National Transportation Safety Board
www.nts.gov/Surface/highway/highway.htm
- NHTSA
www.nhtsa.gov/motorcycles/index.cfm
www.nhtsa.dot.gov/
- StateNet
www.statenet.com/

Appendix. Motorcycle Helmet Use Requirements

All Riders	Specific Segment of Riders (Usually under age 21 or age 18)	No Helmet Required
Alabama	Alaska ¹	Illinois
California	Arizona	Iowa
Georgia	Arkansas	New Hampshire
Louisiana	Colorado	
Maryland	Connecticut	
Massachusetts	Delaware	
Michigan	Florida ²	
Mississippi	Hawaii	
Missouri	Idaho	
Nebraska	Indiana	
Nevada	Kansas	
New Jersey	Kentucky ³	
New York	Maine ⁴	
North Carolina	Minnesota ⁵	
Oregon	Montana	
Tennessee	New Mexico	
Vermont	North Dakota ⁶	
Virginia	Ohio ⁷	
Washington	Oklahoma	
West Virginia	Pennsylvania ⁸	
District of Columbia	Rhode Island ⁹	
Puerto Rico ¹²	South Carolina	
American Samoa	South Dakota	
Guam	Texas ¹⁰	
Northern Marianas	Utah	
U.S. Virgin Islands	Wisconsin ¹¹	
	Wyoming	

Notes

1. Alaska's motorcycle helmet use law covers passengers of all ages, operators younger than age 18, and operators with instructional permits.

2. Florida law requires that all riders younger than age 21 wear helmets, without exception. Those age 21 and older may ride without helmets only if they can show proof that they are covered by a medical insurance policy.

3. Kentucky law requires that all riders younger than age 21 wear helmets, without exception. Those age 21 and older may ride without helmets only if they can show proof that they are covered by a medical insurance policy. Motorcycle helmet laws in Kentucky also cover operators with instructional/learner's permits.

4. Motorcycle helmet laws in Maine cover operators with instructional/learner's permits. Maine's motorcycle helmet use law also covers passengers age 14 and younger and passengers if their operators are required to wear a helmet.

5. Motorcycle helmet laws in Minnesota cover operators with instructional/learner's permits.

6. North Dakota's motorcycle helmet use law covers all passengers traveling with operators who are covered by the law.

7. Ohio's motorcycle helmet use law covers all operators during the first year of licensure and all passengers of operators who are covered by the law.

8. Pennsylvania's motorcycle helmet use law covers all operators during the first two years of licensure unless the operator has completed the safety course approved by PennDOT or the Motorcycle Safety Foundation.

9. Rhode Island's motorcycle helmet use law covers all passengers (regardless of age) and all operators during the first year of licensure (regardless of age).

10. Texas exempts riders age 21 or older if they can either show proof they successfully completed a motorcycle operator training and safety course or can show proof of a medical insurance.

11. Motorcycle helmet laws in Wisconsin cover operators with instructional/learner's permits.

12. Puerto Rico strengthened its motorcycle law in 2007. The law requires riders to wear helmets, boots, gloves and reflective gear while riding at night. The law also imposes new testing requirements.

Source: NCSL and the National Highway Traffic Safety Administration, Insurance Institute For Highway Safety, 2007.



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