

2006

# Motorcycle Safety Program Plan





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# I. Introduction

Significant gains have been made since the enactment of Federal motor vehicle and highway safety legislation in 1966; however, the annual toll of traffic crashes still remains tragically high. In 2004, the National Highway Traffic Safety Administration's Fatality Analysis Reporting System (FARS) and General Estimates System (GES) revealed that an estimated 42,636 people were killed and another 2.8 million were injured on our Nation's roadways. Traffic crashes continue to account for 95 percent of all transportation fatalities and 99 percent of injuries, and represent the leading cause of death for the age group 4 through 34 years old. The large number of crashes has placed a considerable burden on our Nation's health care system affecting the economy, reaching \$230.6 billion a year, an average of \$820 for every person living in the United States.<sup>1</sup>

## People Killed in Motor Vehicle Crashes, by Role and Year

Role	Year		Change	% Change
	2003	2004		
Occupants*	33,627	33,134	-493	-1.50%
Drivers	23,352	23,063	-289	-1.20%
Passengers	10,171	9,991	-180	-1.80%
Motorcycle Riders	3,714	4,008	+294	+7.90%
Non-Occupants	5,543	5,494	-49	-0.90%
Pedestrians	4,774	4,641	-133	-2.80%
Pedalcyclists	629	725	+96	+15%
Other**	140	128	-12	-8.60%
<b>TOTAL</b>	<b>42,884</b>	<b>42,636</b>	<b>-248</b>	<b>-0.60%</b>

\* Includes unknown occupants of motor vehicles in transport.

\*\* Includes occupants of motor vehicles not in transport and of non-motor vehicle transport devices.

Recent data indicates that deaths and injuries attributable to motorcycle crashes are becoming a larger portion of this public health problem. Motorcycle crash-related fatalities have been increasing since 1997, and injuries have been increasing since 1998. Since the passage of the Highway Safety and National Traffic and Motor Vehicle Safety Act of 1966, an estimated 128,000 motorcyclists have died in traffic crashes. All road users are urged to protect themselves from injury or death by wearing safety belts, driving unimpaired, and observing traffic rules. Many motorcycle deaths could be prevented if motorcyclists would take responsibility for ensuring they have done everything possible to make their ride safe. This includes taking a rider training course and obtaining the license endorsement needed to legally operate a motorcycle, wearing personal protective gear including a Federal Motor Vehicle Safety Standard (FMVSS) No. 218-compliant helmet, and riding unimpaired. Additionally, motorists need to heighten their awareness of motorcyclists and share the road safely with these and other motor vehicles.

## Motorcycle Riders Killed, by Year

Calender Year	Fatalities	Calender Year	Fatalities
1975	3,189	1990	3,244
1976	3,312	1991	2,806
1977	4,104	1992	2,395
1978	4,577	1993	2,449
1979	4,894	1994	2,320
1980	5,144	1995	2,227
1981	4,906	1996	2,161
1982	4,453	1997	2,116
1983	4,265	1998	2,294
1984	4,608	1999	2,483
1985	4,564	2000	2,897
1986	4,566	2001	3,197
1987	4,036	2002	3,270
1988	3,662	2003	3,714
1989	3,141	2004	4,008
<b>Total</b>		<b>105,002</b>	

<sup>1</sup> Blincoc, Larry. (May 2002). *The Economic Impact of Motor Vehicle Crashes, 2000*, (DOT HS 809 446). Washington, D.C.: National Highway Traffic Safety Administration.





# II. State of Motorcycle Safety

The effects of a crash involving a motorcycle can be devastating. According to NHTSA's FARS data, while total traffic deaths decreased by 0.6 percent in 2004, motorcycle deaths increased by 8 percent, compared to 2003. Motorcyclist fatalities have increased each year since reaching an historic low of 2,116 in 1997. In 2004, 4,008 motorcyclists were killed, an increase of over 89 percent between 1997 and 2004. Without this substantial increase in motorcyclist fatalities between 1997 and 2004, overall highway fatalities would have experienced a marked reduction of 4.4 percent over this same time period.

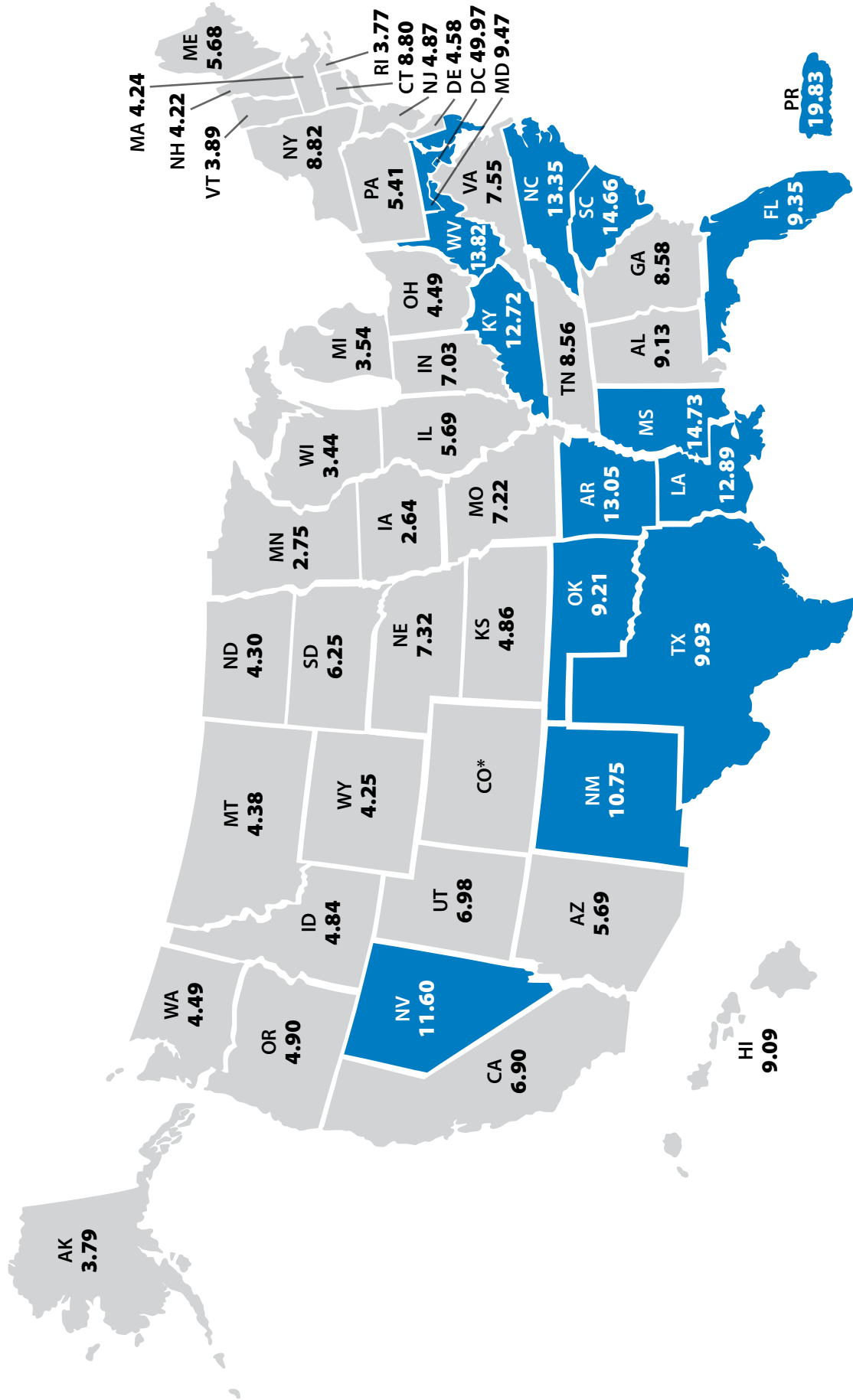
## Total Versus Motorcycle Rider Fatalities by Year, 1997-2004

Fatalities	Year							
	1997	1998	1999	2000	2001	2002	2003	2004
Total	42,013	41,501	41,717	41,945	42,196	43,005	42,884	42,636
Change	---	-512	+216	+228	+251	+809	-121	-248
Motorcycle Riders	2,116	2,294	2,483	2,897	3,197	3,270	3,714	4,008
Change	---	+178	+189	+414	+300	+73	+444	+294
Percent of all Fatalities	5.00%	5.50%	6.00%	6.90%	7.60%	7.60%	8.70%	9.40%

The 2004 motorcycle rider fatality data represents the third-largest percentage increase since 1987 and reflects the levels last seen that year. In 2004, the motorcycle rider fatality rate increased to 39.89 per 100 million vehicle miles traveled (VMT), with motorcycle rider fatalities making up 9.4 percent of all motor vehicle traffic crash fatalities. Twenty-five States are at or below the national average of 6.9 motorcycle fatalities per 10,000 registered motorcycles. Twenty-five States, the District of Columbia, and Puerto Rico are above the national average. Rural areas and southern States continue to experience higher motorcycle fatalities.

Likewise, in 2004, 76,000 motorcyclists were injured in traffic crashes, 13 percent more than the 67,000 motorcyclists that were injured in 2003.

## Motorcycle Rider Fatality Rate Per 10,000 Registered Motorcycles by State



■ Top 15 States for motorcycle rider fatality rate per 10,000 registered motorcycles by State

\*Based on previous year's comparisons the motorcycle registration data provided by FHWA is incorrect for the State of Colorado.



## Motorcycle Rider Fatalities and Injuries and Fatality and Injury Rates, 1994-2004

Year	Fatalities	Registered Vehicles	Fatality Rate*	Vehicle Miles Traveled (millions)	Fatality Rate**
1994	2,320	3,756,555	61.76	10,240	22.66
1995	2,227	3,897,191	57.14	9,797	22.73
1996	2,161	3,871,599	55.82	9,920	21.78
1997	2,116	3,826,373	55.30	10,081	20.99
1998	2,294	3,879,450	59.13	10,283	22.31
1999	2,483	4,152,433	59.80	10,584	23.46
2000	2,897	4,346,068	66.66	10,469	27.67
2001	3,197	4,903,056	65.20	9,639	33.17
2002	3,270	5,004,156	65.35	9,552	34.23
2003	3,714	5,370,035	69.16	9,577	38.78
2004	4,008	5,780,870	69.33	10,048	39.89

Year	Injuries	Registered Vehicles	Injury Rate*	Vehicle Miles Traveled (millions)	Injury Rate**
1994	57,000	3,756,555	1,528	10,240	561
1995	57,000	3,897,191	1,475	9,797	587
1996	55,000	3,871,599	1,428	9,920	557
1997	53,000	3,826,373	1,374	10,081	522
1998	49,000	3,879,450	1,262	10,283	476
1999	50,000	4,152,433	1,204	10,584	472
2000	58,000	4,346,068	1,328	10,469	551
2001	60,000	4,903,056	1,229	9,639	625
2002	65,000	5,004,156	1,293	9,552	677
2003	67,000	5,370,035	1,250	9,577	701
2004	76,000	5,780,870	1,321	10,048	760

\* Rate per 100,000 registered vehicles.

\*\* Rate per 100 million vehicle miles traveled.

Source: Vehicle miles traveled and registered vehicles — Federal Highway Administration.

Traffic deaths — Fatality Analysis Reporting System (FARS), NHTSA. Traffic injuries — General Estimates System (GES), NHTSA.

Per vehicle miles traveled in 2004, motorcyclists were about 34 times more likely than passenger car occupants to die in a motor vehicle traffic crash and 8 times more likely to be injured. This is a steep increase from 1997, when motorcyclists were 15 times more likely to die in a crash than people riding in passenger cars. Per registered vehicle, the fatality rate for motorcyclists in 2004 was 4.8 times higher than the fatality rate for passenger car occupants. The injury rate for passenger car occupants per registered vehicle was 1.1 times lower than the injury rate for motorcyclists. In 2004, motorcyclists accounted for 9 percent of total traffic fatalities, 11 percent of all occupant fatalities, and 3 percent of all occupants injured, while only accounting for 2 percent of all registered vehicles and 0.3 percent of vehicle miles traveled on U.S. roadways.

# Motorcycle Quick Facts

- In 2004, 2,105 (51%) of all motorcycles involved in fatal crashes collided with another motor vehicle. In two-vehicle crashes, 78 percent of the motorcycles involved were struck in the front. Only 6 percent were struck in the rear.
- Motorcycles are more likely than other vehicles to be involved in a fatal collision with a fixed object. In 2004, 26 percent of the motorcycles involved in fatal crashes collided with fixed objects, compared to 18 percent for passenger cars, 12 percent for light trucks, and 4 percent for large trucks.
- Motorcycles are also more likely than other vehicles to be involved in an injury collision with a fixed object. In 2004, 11 percent of the reported injury crashes involving motorcycles were fixed-object crashes, compared to 9 percent for passenger cars, 7 percent for light trucks, and 4 percent for large trucks.
- In 2004, there were 1,803 two-vehicle fatal crashes involving a motorcycle and another vehicle. In 39 percent (711) of these crashes, the other vehicle was turning left while the motorcycle was going straight, passing, or overtaking the vehicle. Both vehicles were going straight in 465 crashes (26%).
- In 2004, 36 percent of all motorcyclists involved in fatal crashes were speeding, which is approximately twice the rate for drivers of passenger cars or light trucks. The percentage of alcohol involvement was 31 percent higher for motorcyclists than for drivers of passenger vehicles.
- Forty-one percent of the 1,672 motorcycle operators who died in single-vehicle crashes in 2004 had blood alcohol concentration (BAC) levels of .08 grams per deciliter (g/dL) or higher. Sixty percent of those killed in single-vehicle crashes on weekend nights had BAC levels of .08 g/dL or higher.
- Data for 2004 shows that motorcycle rider fatalities increased for every age group, but the greatest increases were experienced in the 20-29 and the 40-and-older age groups.
- The percentage with BAC .08 g/dL or above was highest for fatally injured operators between the ages of 35 and 39 (39%), followed by ages 40 to 44 (38%) and ages 45 to 49 (34%).
- Motorcycle engine size also continues to be correlated with fatal crashes. In 2004, mid-size engines (501 to 1,000 cc) showed the largest numbers with 1,631 fatalities, followed by the largest engines (1,001 to 1,500 cc) with 1,542 fatalities. Smaller-engine (up to 500 cc) fatalities have been decreasing over the years, with 221 fatalities in 2004.

# III. External Factors

Motorcycles are becoming more and more prevalent in the vehicle fleet mix. The popularity of this mode of transportation is attributed to the low initial cost of a motorcycle, its use as a recreational vehicle, and, for some models, the good fuel efficiency. Once thought that warm weather brought out the motorcycle enthusiast, the motorcycle industry is now expecting the increased price of fuel to not only further increase sales, but to extend the riding season into the winter months.<sup>2</sup> In 2004, new unit motorcycle sales surpassed the one million mark, reaching levels not seen since the 1970s. However, according to the Motorcycle Industry Council (MIC), motorcycle and scooter sales jumped even higher in the 2005 summer sales season than during 2004, further demonstrating America's growing passion for two-wheeling.<sup>3</sup> MIC statistics show that among 12 of the leading brands, sales of on-highway models for the third quarter of 2005 were up 16 percent compared to the same period in 2004.

According to the MIC, 1973 was the high point for annual motorcycle sales, when Americans purchased more than 1.5 million motorcycles. Sales in 1979 topped the one million mark, but tapered during the 1980s and early 1990s. Motorcycling rebounded in 1993 and the numbers have grown every year since.

## U.S. New-on-Highway Unit Motorcycle Sales, 1992-2004

Year	Unit	Year	Unit
1992	186,000	1999	379,000
1993	201,000	2000	471,000
1994	210,000	2001	556,000
1995	214,000	2002	618,000
1996	228,000	2003	662,000
1997	247,000	2004	725,000
1998	298,000		

Source: Motorcycle Industry Council

State motorcycle rider training programs continue to have difficulty meeting the increased demand. Currently, 47 States have legislated rider education and training programs.<sup>4</sup> Some States do mandate training for motorcyclists under a certain age (generally 18). However, many report waiting times of up to several months to complete a course.

In 2004, 25 percent of motorcycle operators killed in traffic crashes were not licensed or were improperly licensed to operate a motorcycle. By not obtaining a motorcycle operator license, riders are bypassing the only method State licensing agencies have to ensure riders have the minimum knowledge and skills needed to operate a motorcycle.

One of the main reasons motorcyclists are killed in crashes is because the motorcycle itself provides virtually no protection in a crash. An automobile has structured features and restraint systems to provide protection to the occupant. In addition, it has more stability because it is on four wheels, and because of its size, it is easier to be seen. A motorcycle suffers in comparison when considering vehicle characteristics that directly contribute to occupant safety.

The use of a Federal Motor Vehicle Safety Standard (FMVSS) No. 218 compliant helmet lowers the fatality and injury rates of motorcyclists. Decades of research has consistently shown that helmets are the most effective piece of safety gear for motorcycle riders. Helmets are estimated to

<sup>2</sup> Rising gas costs drive up number of motorcyclists, *The Times and Democrat*, October 9, 2005, [www.timesanddemocrat.com/articles/2005/10/09/news/doc4349da88c92d5645406710.txt](http://www.timesanddemocrat.com/articles/2005/10/09/news/doc4349da88c92d5645406710.txt)

<sup>3</sup> Two-wheelers on Track for 13th Straight Year of Growth, *Discover Today's Motorcycling*, Motorcycle Industry Council (MIC), October 17, 2005, [www.motorcycles.org/dtm.cfm?pagename=Media%20News%20Bureau&content=04EAEF84-995B-8C20-5BE0F2B1FB620B9&referer=Media%20Releases](http://www.motorcycles.org/dtm.cfm?pagename=Media%20News%20Bureau&content=04EAEF84-995B-8C20-5BE0F2B1FB620B9&referer=Media%20Releases)

<sup>4</sup> Alaska, Arkansas, Mississippi, and the District of Columbia do not have State-sponsored rider training.





be 37 percent effective in preventing fatal injuries to motorcyclists.<sup>5</sup> Motorcycle helmet use laws are the most effective way to get all motorcyclists to wear helmets. For more than 35 years, States have enacted, amended, repealed, and re-enacted motorcycle helmet laws, usually amid intense public debate. Congress has passed legislation affecting State motorcycle helmet laws four times during this period.

### Congressional Motorcycle Helmet Use Legislation Timeline

<b>1966-1975</b>	All but three States (Colorado, Illinois, and Iowa) enact helmet laws in response to a Federal requirement.
<b>1976-1980</b>	Congress eliminates sanctions: Half the States repeal/amend helmet laws.
<b>1981-1988</b>	No action.
<b>1989-1994</b>	Gradual re-enactment and Congressional encouragement to pass helmet laws.
<b>1995-2003</b>	Congressional leniency on helmet laws; six States repeal.
<b>2004</b>	Louisiana reinstates State universal helmet law.

In 2005, 20 States, the District of Columbia, and Puerto Rico required helmet use by all motorcycle operators and passengers. In another 27 States, only people under a specific age, usually 18, were required to wear helmets. Three States (Colorado, Illinois, and Iowa) have no laws requiring helmet use.

Many other factors affect motorcycle fatality and injury rates. States, local jurisdictions, national organizations, and individuals each have a responsibility for ensuring motorcycle safety. As stated previously, riders need to take personal responsibility for their own safety by taking rider training courses, obtaining proper licensure, wearing FMVSS No. 218 compliant helmets and other protective gear, and riding unimpaired. Likewise, motorists need to heighten awareness of motorcyclists and share the road safely with these and other motor vehicles.

<sup>5</sup> See NHTSA 2004 Traffic Safety Facts at [www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/TSF2004/809908.pdf](http://www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/TSF2004/809908.pdf)

# IV. Current and Future Initiatives

In 1997, NHTSA worked with the Motorcycle Safety Foundation (MSF), a national nonprofit organization promoting safe motorcycling, to provide the leadership and resources to create the *National Agenda for Motorcycle Safety (NAMS)*. NAMS is a strategic planning document that provides a shared national vision for future motorcycle safety efforts by incorporating input from a broad, multi-disciplinary spectrum of stakeholders. Developing this framework involved participation by industry, research, training experts, rider communities, law enforcement, health care, media, and insurance companies. The result was a collaborative document that examines components of motorcycle safety programs at the Federal, State, and local levels and offers strategies for broad-based support and action. It serves as a comprehensive national blueprint, which all interested parties can use to promote and enhance motorcycle safety.<sup>6</sup>

NAMS's recommendations and action items were based on data from 1998 and 1999. By 2000 it became clear that an upward trend in motorcycle crash-related fatalities continued from the increases noted in 1998. Recent data continues to reveal new and emerging trends involving rises in rural versus urban fatalities and deaths among older riders on larger motorcycles. These trends were unknown and, consequently, not addressed in NAMS.

In January 2003, NHTSA released its *Motorcycle Safety Program Plan*.<sup>7</sup> This document centered on crash prevention, which offers the greatest potential safety benefit for motorcyclists, while also addressing injury mitigation and emergency response. The plan encompassed major areas of concern, including the need for more behavioral and vehicle research, as well as the need to obtain

more complete data on specific aspects of motorcycle crashes. It also addressed issues of roadway design that can enhance operator safety. The program plan was built on current and past efforts, and also addressed a number of concerns raised in the NAMS including material designed for medical professionals to teach critical "first on the scene of a motorcycle crash" life-saving techniques to motorcyclists and the general public. In March 2005, NHTSA released its *First There, First Care* training guide fulfilling this key recommendation from the NAMS.

This document updates NHTSA's 2003 *Motorcycle Safety Program Plan* and continues to align with NAMS on some efforts, but also focuses its efforts on more recent trends revealed by NHTSA's FARS data. It presents the priorities and specific program initiatives that NHTSA intends to pursue in the short and long term. The document is consistent with NHTSA's statutory responsibilities in promoting motorcycle safety.



<sup>6</sup> The recommendations in NAMS are not recommendations directed to NHTSA or any Federal Government agency. Those stakeholders in the motorcycle and traffic safety community may adopt and address any recommendation within their authority as appropriate.

<sup>7</sup> See NHTSA's 2003 Motorcycle Safety Program at [www.nhtsa.gov/people/injury/pedbimot/motorcycle/motorcycle03/index.htm](http://www.nhtsa.gov/people/injury/pedbimot/motorcycle/motorcycle03/index.htm)

In addition, the agency is currently developing a NAMS implementation guide. This guide is being developed to assist States, local agencies, and organizations in implementing the goals outlined in the NAMS. The guide will focus on the NAMS recommendations that can be implemented by State and local governments and nongovernmental organizations, which include:

- increasing access to rider education programs;
- increasing the proportion of motorcyclists who are properly licensed;
- reducing the number of motorcyclists riding while impaired;
- increasing motorcyclists' visibility;
- increasing helmet usage; and
- increasing other motorists' awareness of motorcyclists.

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) Pub. L., 109-59, enacted on August 10, 2005, reauthorized many of NHTSA's existing programs and added new ones to carry out NHTSA's regulatory activities and policy agenda. Section 2010 of SAFETEA-LU authorizes a new State motorcyclist safety grant program to support rider training, motorist awareness, and impaired driving programs. In addition, Section 2010 of SAFETEA-LU directs the Secretary of Transportation to work with the NHTSA administrator to develop and provide States with model language for use in traffic safety education courses, driver's manuals, and other driver's training materials instructing drivers on the importance of sharing the road safely with motorcyclists.

Section 2003 of SAFETEA-LU directs the Secretary of Transportation to "conduct a study on educational, public information, and other activities targeted at reducing motorcycle crashes and resulting fatalities and injuries, where the operator of the motorcycle was impaired." Section 5511 of SAFETEA-LU authorizes grants to the Oklahoma Transportation Center to conduct a comprehensive motorcycle crash causation study using the Organization for Economic Cooperation and Development (OECD) methodology. The Federal Highway Administration (FHWA) is overseeing this effort. Last, Section 1914 of

SAFETEA-LU authorizes a Motorcyclist Advisory Council to coordinate with and advise the FHWA administrator on infrastructure issues of concern to motorcyclists.

NHTSA will continue to join with FHWA and the motorcycle and traffic safety communities to improve motorcycle safety. In doing so, a renewed national comprehensive effort needs to take place at all levels – Federal, State, local, and individual – in order to reduce the number of fatalities and injuries attributable to motorcycle crashes.

NHTSA will continue to encourage States to sponsor motorcycle safety technical program assessments (MSPA) and to use the results to better understand how existing State and Federal resources are being distributed, as well as to identify and address inefficiencies in funding and strengthen the States' comprehensive motorcycle safety programs. NHTSA will continue to encourage States to elevate motorcycle safety as a priority; better quantify, analyze and document the problems; and seek and implement science-based innovative solutions.

NHTSA regional offices are requesting that their States hold meetings to raise the public's awareness about motorcycle safety issues and to develop coalitions to address State motorcycle safety issues. States will be asked to evaluate their rider training programs to determine if they are meeting the growing demand for both beginner and advanced rider safety training. States that do not have the necessary resources to address driver training in a timely manner will be asked to expand the States training capabilities. If a State does not have a State-administered motorcycle rider education program, the NHTSA Regional Offices will request that the States determine if a State-operated program is feasible. The NHTSA Regional offices will also work with States to help educate and increase enforcement in areas related to motorcycle safety.

Some of the regions have worked with States to establish partnerships with nontraditional entities such as manufacturers and advocacy groups, expand both the availability of and publicity for rider training programs, and establish working groups in response to recent trends.



In May 2005, NHTSA began hosting quarterly motorcycle safety network meetings with national motorcycling organizations and manufacturers to identify ways to work cooperatively to address the significant increases in motorcycle crashes and the resulting fatalities and injuries. NHTSA will continue to host these quarterly meetings held in Washington, DC.

In February 2006, the agency published a *Federal Register* notice proposing to update Highway Safety Guideline No. 3 – Motorcycle Safety. NHTSA plans to publish the updated guideline on motorcycle safety in the summer of 2006. The guideline provides State highway safety offices current information on effective program content for States to use in developing and assessing their traffic safety programs.

Other motorcycle initiatives being pursued by NHTSA to address the growing problem of motorcycle fatalities and injuries, along with more detailed information on planned SAFETEA-LU activities, are described below.

## A. Data and Research

NHTSA's FARS data provides information on who is involved in motorcycle crashes, but it does not provide information on why a motorcyclist crashed.

### *Background on Issue*

While NHTSA has a considerable knowledge base regarding motorcycle crashes, the data still does not answer the question as to why motorcycle fatalities are on the rise. From recent data, NHTSA has learned who is crashing and also where most motorcycle crashes occur, but still needs to determine why older riders with bigger bikes on our Nation's rural roadways continue to represent the fastest growing group of fatalities. Basic questions remain including: What are the characteristics of motorcycle riders and their riding habits that distinguish those who are crash-involved from those who are not? What is the risk of crash involvement at increasing blood alcohol levels? What vehicle-, roadway-, driver-, and rider-related factors are associated with the recent increase in motorcycle fatalities?

### *Highlights of Current Program*

NHTSA has collected and analyzed data on motorcycle crashes since 1975. NHTSA's National Center for Statistics and Analysis (NCSA) provides analytical and statistical support to the agency and to the highway safety community through data collection, crash investigation, and data analysis.



In 1999, with motorcyclist fatalities in single-vehicle crashes accounting for almost half (46%) of the fatalities from all fatal motorcycle crashes, the report - *Fatal Single-Vehicle Motorcycle Crashes* (DOT HS 809 360), was written to provide insight into the possible causes for these fatalities. The analysis was based on 1990-1999 data from FARS.

*Motorcyclist Fatalities in 2000 Research Note* (DOT HS 809 387), released in December 2001, compared the 2000 FARS to the trends and rates from the earlier report.

In June 2001, NCSA released *Recent Trends in Fatal Motorcycle Crashes* (DOT HS 809 271), a report that examined all motorcycle fatalities from 1990 to 1999. This report includes analyses from FARS, MIC, FHWA, and the United States Census Bureau in exploring the recent increases in the number of motorcyclist fatalities and contributing variables.

In September 2005, NCSA released *Motorcycle Helmet Use in 2005 — Overall Results* (DOT HS 809 937). The National Occupant Protection Use Survey (NOPUS) is the only probability-based observational survey of motorcycle helmet use in the United States. The survey observes usage as it actually occurs at a random selection of roadway sites, and so provides the best tracking of helmet use in the United States. It showed that helmet use declined nationwide to 58 percent in 2004 from 71 percent in 2000.

Most recently, in October 2005 NCSA released *Impaired Motorcycle Operators Involved in Fatal Crashes* (DOT HS 809 939). The data was obtained from NHTSA's FARS database, which annually collects impaired-riding crash statistics from the 50 States, the District of Columbia, and Puerto Rico. The report found an increase in the number of impaired (BAC $\geq$  .08) motorcycle operators involved in fatal crashes over the past few years.

### **Proposed Initiatives**

As stated above, NCSA released a comprehensive study relating to fatal motorcycle crashes in June 2001. This study was completed in response to a reversal in trend since fatalities increased two years in a row after declining each year between 1993 and 1997, reaching an historic low of 2,116 fatalities in 1997. NCSA will update this study since motorcycle rider fatalities have now increased for seven years in a row since 1997. Trend data from 1997 to 2004 will be analyzed along with data from MIC and exposure data from FHWA.

The agency will also determine the characteristics of motorcycle operators in today's general rider population and, to the extent possible, the characteristics, behaviors, and experiences associated with motorcyclists who become involved in a crash. Data to be collected include biographic and demographic characteristics, riding habits, rider training, crash involvement, and licensing status.

SAFETEA-LU authorizes the FHWA to conduct a comprehensive motorcycle crash causation study through the Oklahoma Transportation Center. NHTSA is currently conducting a pilot study to

develop a protocol for using the methodology defined by the OECD. This method specifies how in-depth investigations should be conducted at the crash scenes during the immediate post-crash period, as well as specific data elements to be collected. Data to be acquired includes roadway and environmental conditions, as well as all involved vehicles and equipment. Also, in-depth interviews with riders, motorists, and available witnesses will be conducted on-scene to the extent possible, and all riders and motorists will also be tested for alcohol using Preliminary Breath Testers by researchers working to better understand motorcycle crash causes and countermeasures to these crashes. Once the protocol is sufficiently developed, it will be made available for use on the comprehensive crash causation study.

### **Expected Program Outcomes**

Ultimately, the collection and analysis of data on motorcycle operator characteristics should enable NHTSA to improve the types of countermeasures developed for reducing the occurrence of injury-producing crashes. NHTSA's data collection and research efforts will also continue to try to resolve questions surrounding the medical outcomes of crash-involved motorcyclists including short- and long-term effects and the costs of rehabilitation for injured operators.

## **B. FMVSS No. 218 Compliant Helmets and Other Personal Protective Equipment**

Helmets and personal protective equipment worn by motorcyclists provide the primary defense against injury in a crash. Studies show that the head, arms, and legs are most often injured in a crash. Unhelmeted motorcyclists involved in crashes are three times more likely to suffer brain injuries than those wearing helmets.<sup>8</sup> Protective clothing and equipment serve a three-fold purpose for motorcyclists: comfort and protection from the elements; injury protection; and through

<sup>8</sup> National Highway Traffic Safety Administration. (February 1996). Report to Congress: Benefits of Safety Belts and Motorcycle Helmets. (DOT HS 808 347). Washington, DC: National Highway Traffic Safety Administration.

the use of color or reflective material, a means for other motorists to see the motorcyclist. Motorcycle operators and passengers should use the following personal protective gear:

- motorcycle helmets that meet FMVSS No. 218;
- proper clothing (preferably retroreflective), including gloves, boots, long pants, and a durable long-sleeved jacket; and
- eye and face protection.

### Background on Issue

Decades of research has consistently shown that helmets are the most effective piece of safety gear for motorcycle riders. Helmets are estimated to be 37 percent effective in preventing fatal injuries and 67 percent in preventing brain injuries to motorcyclists. This means for every 100 motorcyclists killed in crashes while not wearing helmets, 37 of them could have been saved had all 100 worn helmets. In 2004, about two-thirds of the fatally injured motorcycle riders were not wearing helmets in States without universal helmet laws (law requiring all motorcycle operators and passengers to wear helmets) compared to 15 percent in States with universal helmet laws. NHTSA estimates that helmets saved the lives of 1,316 motorcyclists in 2004. If all motorcyclists had worn helmets, an additional 671 lives could have been saved.

According to NHTSA's 2005 National Occupant Protection Use Survey (NOPUS) results, helmet use declined by 23 percentage points over five years, from 71 percent in 2000 to 48 percent in 2005. This drop is statistically significant and corresponds to a striking 45 percent increase in nonuse. In comparison, in 2004, reported helmet use rates for fatally injured motorcyclists were 56 percent for operators and 47 percent for passengers.<sup>9</sup>

Since 1997, six States (Texas, Arkansas, Kentucky, Louisiana, Florida, and Pennsylvania) have repealed their universal motorcycle helmet laws.

<sup>9</sup> 2005 fatality data not yet available

<sup>10</sup> Age-specific laws are very difficult to enforce.

<sup>11</sup> See NHTSA's Evaluation of the All-Rider Motorcycle Helmet Law in Florida at [www.nhtsa.dot.gov/people/injury/pedbimot/motorcycle/FlaMCRreport/images/FloridaMCR-reportsr1.pdf](http://www.nhtsa.dot.gov/people/injury/pedbimot/motorcycle/FlaMCRreport/images/FloridaMCR-reportsr1.pdf).

Louisiana reinstated its universal motorcycle helmet law in August 2004. Currently, 20 states, the District of Columbia, and Puerto Rico require helmet use by all motorcycle operators and passengers. In another 27 States, only people under a specific age, usually 18, are required to wear helmets.<sup>10</sup> Three States (Colorado, Illinois, and Iowa) have no laws requiring helmet use. Several States are currently considering helmet law repeals.

### Fatally Injured Motorcycle Riders in States with Universal Helmet Laws versus Without Universal Helmet Laws

Year	2003		2004	
Total in States with Universal Helmet Laws	1,610	100%	1,677	100%
Helmeted	1,365	85%	1,428	85%
Not Helmeted	245	15%	249	15%
Total in States without Universal Helmet Laws	2,104	100%	2,331	100%
Helmeted	615	29%	792	34%
Not Helmeted	1,489	71%	1,539	66%

Motorcycle rider fatalities whose helmet use was unknown were distributed proportionally to the known use categories. Total fatalities may not add due to rounding.

NHTSA's evaluations of the repeal of universal helmet laws in Kentucky, Louisiana, Texas, Arkansas, and Florida all show that helmet use drops from near 100-percent compliance to about the 50-percent range within the first year. NHTSA recently completed its evaluation of Florida's helmet law repeal.<sup>11</sup> Effective July 1, 2000, Florida eliminated the legal requirement that all motorcycle riders wear helmets. State law now requires helmet use only by riders under the age of 21 and riders who do not carry at least \$10,000 of medical insurance. In Florida, motorcyclist fatalities increased by 81 percent, comparing 2001-2003 to 1997-1999, compared to a 48-percent increase nationally. Non-fatal serious injuries began increasing in the first six months of 2000, and increased by 32 percent in the first full year following law repeal. There was a 40-percent increase in the number of injured motorcyclists who were admitted to hospitals, with admission



for head injuries increasing by 82 percent. The average head injury treatment cost increased by almost \$10,000, to \$45,602. Only one-in-four of those hospitalized had costs less than \$10,000, the required level of medical insurance to ride without a helmet in Florida.

Fatalities increased by 24 percent above what was expected from the increased registrations after repeal of the all-rider motorcycle helmet law in Florida, beginning before the law was in effect in July. Florida crash reports also indicated that helmet use declined markedly among riders under 21, who were still covered by the law. Fatalities in this age group nearly tripled (188% increase) in the three years after the law change.



### *Highlights of Current Program*

On March 1, 1974, the agency amended Part 571 of Title 49, Code of Federal Regulations (38 FR 22391) to add FMVSS No. 218, Motorcycle Helmets, which established minimum performance requirements for helmets designed for use by motorcyclists and other motor vehicle users. The requirements of FMVSS No. 218 were mainly adopted from the American National Standard Institute (ANSI) Z90.1-1971 titled “American National Standard for Protective Headgear – for Motor Vehicular Users – Specifications.” The FMVSS No. 218 requirements included impact attenuation, penetration resistance, retention, labeling, projections, and peripheral vision.

In June 2005, 48 percent of motorcyclists in the United States used DOT-compliant helmets, a 10-percent drop from 2004.<sup>12</sup> The agency is aware of

the practice of noncompliant helmets being labeled as certified helmets through the use of stickers sold by some motorcycle shops and other sources.<sup>13</sup> The primary method of false certification is by affixing a DOT symbol to a non-certified motorcycle helmet. Since the standard does not specify the exact configuration of the symbol other than size, location, and contrasting color, the sticker can easily be made by anyone. This practice undermines the intent of the agency’s motorcycle helmet safety standard. The practice also makes it difficult for the States to enforce their motorcycle helmet use laws. Motorcycle riders who wear noncompliant helmets with counterfeit DOT stickers may knowingly or unknowingly forfeit the head protection that is provided by certified motorcycle helmets. Additionally, riders need to understand the importance of wearing a compliant helmet and other protective gear in the event of a crash, to limit the extent of any injuries suffered.

### *Proposed Initiatives*

The Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 required DOT and NHTSA to study the benefits of using safety belts and motorcycle helmets. NHTSA released this study in February 1996.<sup>14</sup> To further NHTSA’s data collection and research efforts, NHTSA’s NCSA will update the motorcycle helmets portion of this study based on data from the Crash Outcome Data Evaluation System (CODES). Imputation techniques will be implemented, in addition to probabilistic linkage, to ensure comparison of the total population involved.

To enhance State helmet enforcement and adjudication efforts, NHTSA is considering amending FMVSS No. 218, Motorcycle Helmets, to address the falsification of helmet certifications resulting from the non-specific labeling requirements of the motorcycle helmet standard.

<sup>12</sup> See NHTSA’s Research Note “Motorcycle Helmet Use in 2005 — Overall Results,” March 2005, DOT HS 809 937 at <http://www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/RNotes/2005/809-937/809937.html>

<sup>13</sup> See <http://store.helmetsrus.com/doourthst.html> accessed on September 28, 2005.

<sup>14</sup> National Highway Traffic Safety Administration. (February 1996). Report to Congress: Benefits of Safety Belts and Motorcycle Helmets. (DOT HS 808 347). Washington, DC.

NHTSA will also implement an outreach program directed at motorcycle helmet manufacturers. To this end, NHTSA will attend trade show events to conduct field inspections of motorcycle helmets and provide information to manufacturers about the requirements of FMVSS No. 218 and the agency's procedural requirements for lawfully importing these helmets.

Communication efforts to assist in this endeavor will include the development of a video clip designed to assist motorcyclists and law enforcement to distinguish noncompliant helmets from those that meet the Federal safety standard and provide information on how to choose a properly fitted helmet. The video clip will be posted on NHTSA's Web site.

Additionally, NHTSA will develop a public service announcement to promote helmet use. The agency will also update its motorcycle helmet use support material.

Last, NHTSA will conduct an evaluation of the reinstatement of the Louisiana all-rider helmet law. In June 2004, Louisiana reinstated its all-rider helmet law in response to the substantial increase in motorcyclist fatalities and injuries. The evaluation will assess the changes following the reinstatement. Researchers will examine variables such as helmet usage rates, law enforcement citation data, fatality and injury rates, injury patterns of motorcyclists admitted to trauma centers, emergency rooms, or long-term rehabilitation centers, and health care cost data for injured motorcyclists.<sup>15</sup>

### *Expected Program Outcomes*

NHTSA's update to "Benefits of Safety Belts and Motorcycle Helmets" will provide the agency, Congress, and the States with outcome data in terms of mortality, relative incidence, injury severity, and hospital charges. States may then use this data when considering universal helmet use laws.

Amendments to FMVSS No. 218 that would address the labeling issue potentially could result in a safety benefit through increased use of proper

head protection by motorcycle riders. Initial estimates indicate that revisions to the labeling provision may result in costs as low as three cents per helmet for an estimated 3.6 million certified helmets manufactured per year with a total cost of  $\$0.03 \times 3,600,000 = \$108,000$ .<sup>16</sup> In addition to improving enforceability and safety, reducing the sale and use of unauthorized DOT stickers on uncertified motorcycle helmets will reduce the financial disadvantage forced on motorcycle helmet manufacturers that design, test, and certify their helmets to the standard.

NHTSA expects its evaluation of the Louisiana all rider helmet law reinstatement will provide further data to support the efficacy of helmets and universal helmet use laws. The agency believes that if all riders were to wear the proper protective gear, mainly a helmet complying with FMVSS No. 218, there would be a reduction in rider fatalities and injuries.

## C. Rider Education and Training

Motorcycle rider education provides an opportunity for novice riders to learn the basic skills necessary to operate a motorcycle safely and for experienced riders to refresh and refine their techniques. To satisfy demand, State training programs should provide training at sites accessible by riders throughout the State and offer classes frequently and with little delay to interested riders. The motorcycle industry and dealers specifically should be allowed and encouraged to host rider training classes using State approved curriculum.

### *Background on Issue*

NHTSA recognizes that there is an increasing demand for rider education and training courses and that some States have difficulty meeting this demand. Although 47 States have State-legislated motorcycle rider education programs, administration varies between States. The great variation in

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<sup>15</sup> The project is currently on hold due to destruction in the region from Hurricanes Katrina and Rita.

<sup>16</sup> Data from OVSC.

rider education programs across States, in terms of both scope and modes of administration, combined with a lack of a centralized database on State practices, has made it difficult for States and programs to exchange information and benefit from one another's operation or training experiences.

### *Highlights of Current Program*

The agency continues to work with the Motorcycle Safety Foundation, the American Association of Motor Vehicle Administrators, the National Association of State Motorcycle Safety Administrators (SMSA), and other partners to enhance State motorcycle rider education programs. In addition, NHTSA has worked with the SMSA to develop a forecasting methodology to assist State rider education and training programs with meeting the increasing training demand, identifying resources needed to meet the demand, and developing an action plan for reaching rider education and training goals.

In April 2005, NHTSA published a detailed State-by-State listing of rider education and training programs to assist with the exchange of information among States. In July 2005 NHTSA released *Promising Practices in Motorcycle Rider Education and Licensing*.<sup>17</sup> This report outlines administrative efforts by various State programs that have implemented high-quality rider training and comprehensive licensing programs. A research-based model of promising practices in rider education and licensing was used to examine the administrative practices of 47 States that offer state-legislated motorcycle rider education. On the basis of the review and analysis, five promising practice States in motorcycle rider education and licensing were identified and five recommendations were provided. These recommendations provide guidelines for States interested in improving their rider education program, focusing on critical components of administration, rider education, and licensing.

Promising Practice Rider Education and Training Recommendations:

1. Organize rider education program and licensing program under the same administrative agency.
2. Explore alternative sources of funding to support rider training activities.
3. Centralize registration and increase the flexibility of course schedules.

4. Offer classes targeted toward experienced operators who are riding without a license.
5. Implement ongoing training, monitoring, and mentoring of instructors.

### *Proposed Initiatives*

In cooperation with SMSA, NHTSA will create professional development workshops to assist States in improving their rider education programs and increase program capacity to meet student demand and reduce training backlogs. Demonstration grants will be awarded to promote the implementation of successful practices in the administration and operation of rider training and



licensing programs as identified in the publication *Promising Practices in Motorcycle Rider Education and Licensing*. In addition, the agency will implement the State motorcyclist safety grant program authorized in SAFETEA-LU. The grant program will provide States funding to support rider education and motorist awareness programs.

The agency will also begin to identify cost effective and efficient policies and practices to allow State rider education and training programs to maximize limited funding while continuing to meet increasing demand.

NHTSA will continue to participate with the Maryland CODES Team, the National Study Center, the Maryland Highway Safety Office, and the Maryland Motor Vehicle Administration in the State motorcycle safety advisory committee. This advisory committee has focused on reviewing the State's efforts

<sup>17</sup> See NHTSA's Promising Practices in Motorcycle Rider Education and Licensing report at [www.nhtsa.dot.gov/people/injury/pedbimot/motorcycle/MotorcycleRider/pages/contents.html](http://www.nhtsa.dot.gov/people/injury/pedbimot/motorcycle/MotorcycleRider/pages/contents.html).



in reducing motorcycle crashes and fatalities and increasing motorcycle safety awareness.

NHTSA will also use the data from existing CODES States to compare three distinct groups of motorcyclists. Initially, data on people who were: (1) successful and (2) not successful in completing the basic motorcycle rider training course will be obtained from the MVAs for calendar years 1995 through 2002. The third group will be comprised of people who have obtained new or renewed motorcycle licenses since 1995, but for whom it is unknown as to whether they have passed a motorcycle training course.

NHTSA and the MSF have joined to examine motorcyclists' crash-avoidance skills in relation to rider education and training. A major objective of this project is to evaluate the effectiveness of current MSF rider education and training curricula for improving rider crash avoidance skills. A multiyear study is planned.

### Expected Program Outcomes

Collectively, the desired outcome for efforts described is to allow States to make improvements to their rider education programs. By identifying cost-effective and efficient policies and practices for motorcycle rider education and training programs, limited State funding could be further maximized, to not only assist in meeting increased demand, but to potentially standardize practices among States. By ensuring the availability of training, potential riders would learn the basic skills necessary to operate a motorcycle safely, which in turn could help reduce the number of motorcycle rider serious injuries and fatalities. SAFETEA-LU's Section 2010 motorcyclist safety grant program will support this effort.

Through the CODES data network project, NHTSA hopes to gain a better understanding of possible links between a rider's training history and crash involvement. To aid in this effort, it would also be advantageous for a State's motorcycle rider education program to include a program evaluation plan to offer additional insight into the effectiveness of rider training.

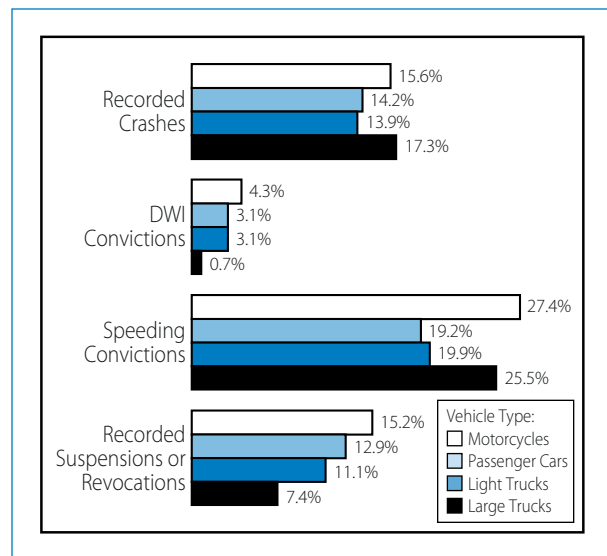
## D. Licensing

Motorcycle operator licensing is a major component of a comprehensive State motorcycle safety program.<sup>18</sup> By obtaining a specialized motorcycle license, a motorcyclist demonstrates the minimum ability needed to safely operate a motorcycle on the roadway. All States and the District of Columbia require that motorcycle operators who use public roadways possess a valid motorcycle license or endorsement. To receive a license, operators must pass a written knowledge and skills test. Beyond these stipulations, States vary in their procedures for licensing riders and for encouraging unlicensed operators to obtain the required license.

### Background on Issue

In 2004, 24 percent of motorcycle operators involved in fatal crashes were operating the vehicle without a proper license. ("Improperly licensed" is defined as not licensed to operate a motorcycle, or a license suspended, revoked, expired, canceled, or denied, or no endorsement to operate a motorcycle.) This compares to 12 percent of passenger vehicle drivers in fatal crashes not having a valid license. Motorcycle operators involved in fatal traffic crashes were 1.3 times more likely than passenger vehicle drivers to have a previous license suspension or revocation (15 percent and 12 percent, respectively).

### Previous Driving Records of Drivers Involved in Fatal Traffic Crashes, by Type of Vehicle, 2004



<sup>18</sup> See Promising Practices in Motorcycle Rider Education and Licensing at [www.nhtsa.dot.gov/people/injury/pedbimot/motorcycle/MotorcycleRider/pages/contents.html](http://www.nhtsa.dot.gov/people/injury/pedbimot/motorcycle/MotorcycleRider/pages/contents.html)

## Highlights of Current Program

NHTSA will continue to examine the relationship between States' rider education and training programs and their licensing practices. To the extent possible, NHTSA is encouraging State licensing programs to work in concert with rider education and training programs to issue an operator license, as appropriate, upon successful completion of a rider-training course. NHTSA will continue to work with law enforcement agencies to enforce licensing laws, and with motorcycling organizations to increase the number of properly licensed motorcyclists.

## Proposed Initiatives

In cooperation with AAMVA, NHTSA will update the *Motorcycle Operator Licensing System* and *Integrating Motorcycle Rider Education and Licensing* guidelines. NHTSA, AAMVA, and a variety of National and State organizations are working collectively to identify and make the necessary changes to these manuals. Once complete, NHTSA hopes that States will adopt and implement the revised guidelines.

NHTSA is also conducting a research study in Maryland to increase motorcycle licensure. In Maryland in 2001, 14 percent of registered motorcycle owners failed to obtain proper motorcycle licensure. Crash analysis revealed that motorcycle owners without proper licensure were overrepresented in the motorcycle crash fatalities for the State. This project will evaluate the use of motorcycle safety educational materials to increase proper licensure in the State.

## Expected Program Outcomes

The desired outcome of NHTSA's efforts in licensing is for licensing agencies to follow comprehensive testing practices that require applicants to pass written knowledge tests and skills tests. Through the Maryland pilot project, NHTSA hopes motorcycle licensure of registered motorcycle owners will increase in the State. If successful, the agency hopes that other States will implement similar programs to reduce the number of unlicensed motorcycle riders in their respective States.

NHTSA hopes that by updating the *Motorcycle Operator Licensing System* and *Integrating Motorcycle Rider Education and Licensing* guidelines that States will adopt and implement the guidelines in increasing motorcycle licensure.

## E. Rider Impairment

Alcohol and other drugs are major risk factors in all types of motor vehicle crashes. These factors appear more frequently in motorcycle crashes than in crashes of other vehicle types, with the most prominent factor being the consumption of alcohol.<sup>19</sup> As of August 2005, .08 BAC legislation became effective in all 50 States, the District of Columbia, and Puerto Rico.

### Background on Issue

In 2004, the percentage of drivers with a blood alcohol concentration (BAC) of .08 grams per deciliter (g/dL) or higher in fatal crashes was highest for motorcycle operators.

### Drivers/Operators Involved in Fatal Crashes with a BAC $\geq$ .08 g/dL by Vehicle Type

Vehicle Type	Percentage
Passenger Cars	22
Light Trucks	21
Large Trucks	1
Motorcycles	27

Source: FARS 2004 (ARF)

In 2004, 28 percent of all fatally injured motorcycle operators had BAC levels of .08 or higher. An additional 6 percent had lower alcohol levels (BAC .01 to .07). The intoxication rate was highest for fatally injured operators between the ages of 35 and 39 (39%), followed by ages 40 to 44 (38%), and ages 45 to 49 (34%). Forty-one percent of all operators killed on motorcycles with 1,001 to 1,500-cc engine sizes had alcohol in their blood (7% with BAC of .01 to .07, 34% with BAC of .08 or higher).

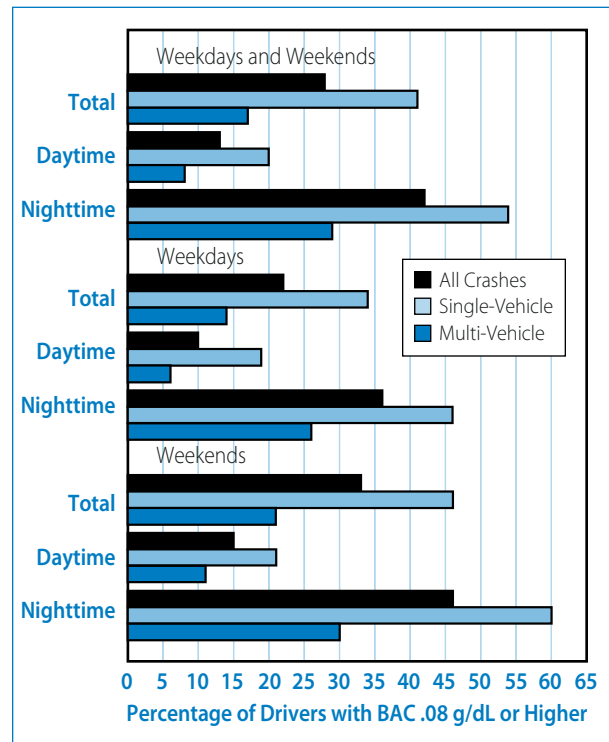
<sup>19</sup> Other substances and causes of impairment (e.g., prescription drugs, over-the-counter drugs, illegal recreational drugs, environmental factors, and drowsiness) largely continue to be unknown factors in motorcycle crashes.

In 2004, 4.3 percent of motorcycle operators in fatal crashes had at least one prior conviction for driving while intoxicated on their driver records, compared to 3 percent of passenger vehicle drivers.

Forty-one percent of the 1,672 motorcycle operators who died in single-vehicle crashes in 2004 had BAC levels of .08 g/dL or higher. Sixty percent of motorcycle operators killed in single-vehicle crashes on weekend nights had BAC levels of .08 g/dL or higher. Motorcycle operators killed in traffic crashes at night were three times more likely than those killed during the day to have BAC levels of .08 g/dL or higher (42% and 13%, respectively).

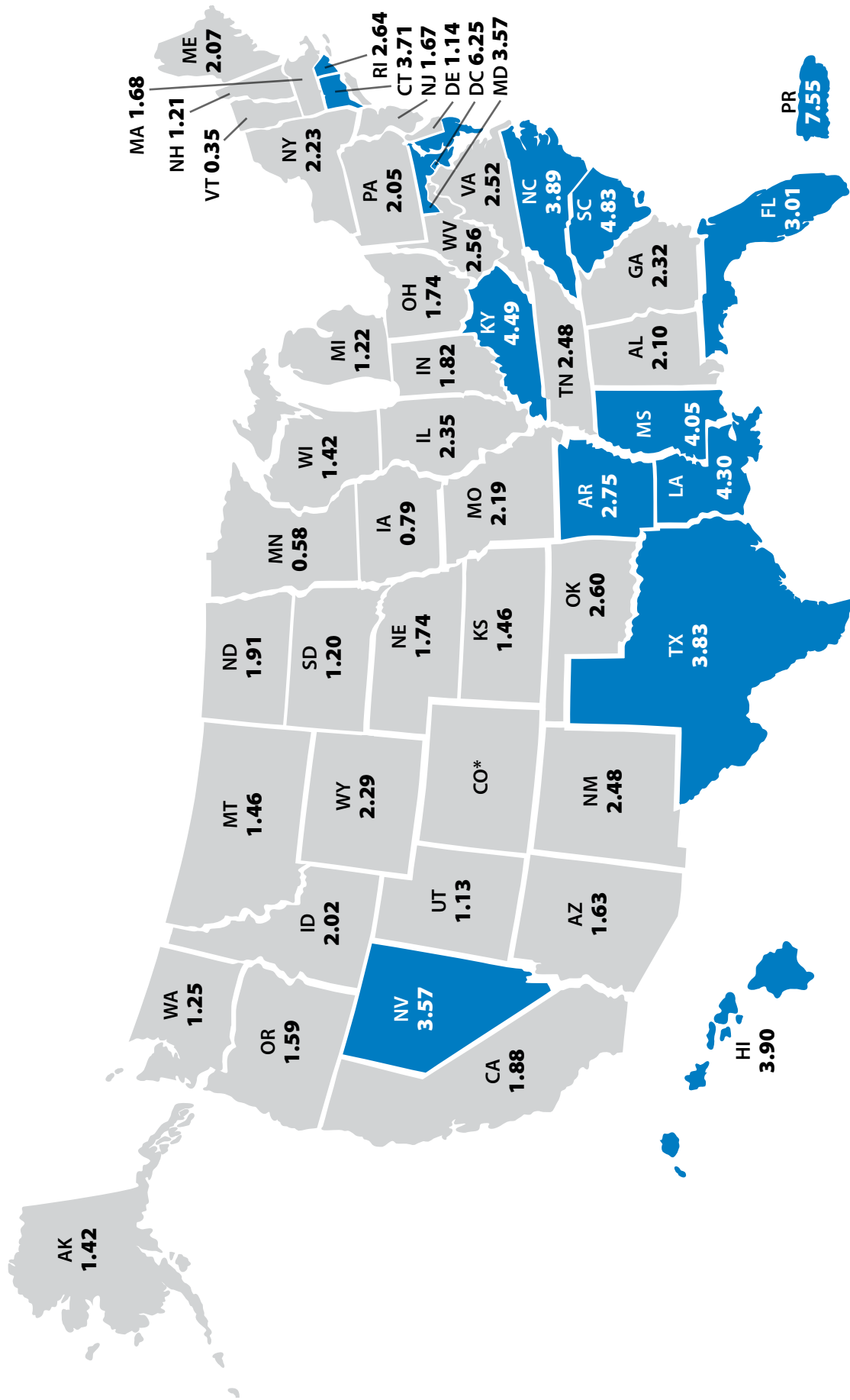
The risk in drinking and then riding is exacerbated by and possibly correlated with other risk-taking behaviors, such as riding without a helmet and other proper protective gear. The reported helmet usage rate for motorcycle operators with BAC levels of .08 g/dL or higher killed in traffic crashes was 41 percent, compared with 63 percent for those with no alcohol.

## Intoxication Rates for Motorcycle Operators Killed in Traffic Crashes, by Time of Day, 2004



Twenty-seven States are at or below the national alcohol-related motorcycle fatality rate average of 2.31 per 100 million VMT. Twenty-three States, the District of Columbia, and Puerto Rico are above the national average. The United States' overall alcohol-related fatality rate was 0.51 in 2004. The alcohol-related motorcycle fatality rate was 220 percent above the overall U.S. alcohol-related fatality rate, with rural areas and southern States showing the highest fatality rates.

# Motorcycle Operator Fatality Rate by Operator BAC (BAC .01+) per 10,000 Registered Motorcycles by State



■ Top 15 States for motorcycle operator fatality rate by operator BAC (BAC .01+) per 10,000 registered motorcycles by State  
 \*Based on previous year's comparisons the motorcycle registration data provided by FHWA is incorrect for the State of Colorado.



## Highlights of Current Program

In order to combat the impaired-rider problem, NHTSA has ongoing programs and is currently developing new strategies based on knowledge learned from recent studies. A report *Drinking, Riding and Prevention – A Focus Group Study* (November 2002) examined the attitudes and beliefs of motorcyclists' regarding drinking and riding and found that: (1) riders often discourage peers from riding after drinking, but a culturally reinforced respect for rider freedom and individual responsibility sets intervention boundaries; (2) rider concern for the safety and security of the motorcycle (i.e., leaving the motorcycle and getting home an alternative way) nearly always overshadows concern for individual safety and contributes to riding even after drinking; and (3) motorcycle impoundment and court-ordered payment for vehicle storage, alcohol treatment programs, and other costs are considered persuasive countermeasures that seem to deter drinking and riding. The results suggested that the integration of social norm models into drinking-and-riding prevention programming may be a promising approach.

## People Killed in Alcohol-Related Crashes, by Role

Role	Year		Change	% Change
	2003	2004		
Occupants*	12,997	12,636	-361	-2.80%
Drivers	9,445	9,185	-260	-2.80%
Passengers	3,512	3,418	-94	-2.70%
Motorcycle Riders	1,547	1,560	+13	0.80%
Non-Occupants	2,561	2,498	-63	-2.50%
Pedestrians	2,282	2,211	-71	-3.10%
Pedalcyclists	235	249	+14	6.00%
Other**	44	39	-5	-11%
<b>TOTAL</b>	<b>17,105</b>	<b>16,694</b>	<b>-411</b>	<b>-2.40%</b>

\* Totals include occupants whose seating position was unknown.

\*\* Includes occupants of motor vehicles not in transport and of non-motor vehicle transport devices.

Other efforts to reduce impaired riding have been multifocused. The agency has and will continue to work with law enforcement to increase the

use of the motorcycle DWI detection cues and enforcement of State impaired driving laws for motorcyclists. In March 2005, NHTSA revised *The Detection of Driving While Intoxicated (DWI) Motorcyclists* brochure.<sup>20</sup> This brochure is based on NHTSA-sponsored research conducted in the late 1980s that developed a set of behavioral cues to be used by law enforcement personnel to assist in the detection of motorcyclists who are operating their vehicles while intoxicated.

Also, in 2005, impaired motorcycle riding was integrated into NHTSA's High-Visibility Enforcement (HVE) campaign planner.

In addition, partnerships with national motorcycling organizations and manufacturers will be strengthened to gain the commitment of all parties to work to reduce impaired riding through a variety of ways including: advertising, training, and policies governing motorcycling events.

## Proposed Initiatives

Currently, NHTSA is conducting a closed-course study to examine the impairing effects of alcohol on performance-related motorcycle skills at different BAC levels.

The agency is supporting the development, implementation, and evaluation of an innovative, multifaceted program that tests different strategies designed to reduce the number of alcohol-related motorcycle crashes through a cooperative agreement with Innocorp of Wisconsin. Key components of this program are enforcement of existing impaired-driving laws; providing storage for motorcycles when operators are too impaired to ride home; joining with tavern owners and motorcycle dealers; and development of public information and education materials targeting motorcyclists, dealers, and the general public.

NHTSA is also developing a peer-to-peer drinking-and-riding prevention curriculum to be used in rider training programs and at group functions

<sup>20</sup> See *The Detection of DWI Motorcyclists* at [www.nhtsa.dot.gov/people/injury/pedbimot/motorcycle/610DWIMotorcyWeb/images/Motorcyclists.pdf](http://www.nhtsa.dot.gov/people/injury/pedbimot/motorcycle/610DWIMotorcyWeb/images/Motorcyclists.pdf)

such as club meetings. The curriculum is currently being piloted and evaluated throughout Georgia in conjunction with the Georgia Department of Motor Vehicle Safety, Motorcycle Safety Program.

In addition, Section 2003 of SAFETEA-LU directs the Secretary of Transportation to “conduct a study on educational, public information, and other activities targeted at reducing motorcycle accidents and resulting fatalities and injuries, where the operator of the motorcycle is impaired.” SAFETEA-LU further directs the Secretary to submit a report to Congress on the results of the study that includes data collected and statistics compiled, as well as recommendations to reduce the number of alcohol-related motorcycle crashes and the resulting fatalities and injuries.

A separate initiative is ongoing to assess the feasibility of alternative approaches to determine the relative risk of alcohol-impaired riders. The research project will provide information regarding a variety of approaches that may be used to determine crash risks among riders who drink. Draft technical reports on alternative approaches identified are currently under review.

By August 2006, NHTSA anticipates that impaired riding will be included in the High-Visibility Enforcement (HVE) campaign and campaign planner. Law enforcement agencies throughout the country will participate in the HVE initiative.

### ***Expected Program Outcomes***

The agency recognizes that it will take more than public information and education to solve the impaired-riding problem. By continuing to work with law enforcement organizations at the national, State, and local levels, NHTSA hopes to develop additional strategies to more aggressively enforce impaired-riding laws. The findings from NHTSA’s study to determine motorcycle impairment at different BAC levels should provide valuable information on the BAC level where impairment begins and its effects at increased levels for riders at different levels. In combination with on-the-road data from crash and non-crash-involved

riders more specific information about alcohol impairment and crash risk will be obtained for further impaired-riding countermeasure development.

The Wisconsin demonstration program will provide resources to reduce impaired motorcycle riding by promoting positive riding behaviors and using motorcycle dealers, law enforcement, and establishments that serve alcohol to help market the importance of sober riding. The results of this demonstration project will be analyzed and provided to all States to use in developing programs to address impaired riding.

One of NHTSA’s goal for the peer-to-peer drinking-and-riding prevention curriculum is to increase awareness of riders regarding drinking and riding. In addition, the agency hopes it will encourage riders to intervene when they observe others that have been drinking and are about to ride, by providing tools that can be used to prevent them from riding.

## **F. Motorist Awareness and Motorcycle Conspicuity**

It is critical for motorists to learn to recognize and share the road safely with motorcyclists. A large number of motorcycle crashes include two key crash components: poor speed-spacing judgment of other drivers and poor motorcycle conspicuity. Motorists need to be aware that their actions affect the safety of motorcyclists.



## *Background on Issue*

In 2004, there were 1,803 two-vehicle fatal crashes involving a motorcycle and another vehicle. In 39 percent (711) of these crashes the other vehicle was turning left while the motorcycle was going straight, passing, or overtaking the vehicle. Both vehicles were going straight in 465 crashes (26%). Because of the motorcycle's size and unique handling characteristics, other roadway users may not understand the actions that motorcyclists take to safely interact in traffic.

## *Highlights of Current Program*

In educating motorists on learning to recognize and share the road with motorcyclists, NHTSA, while expanding the network of its existing highway safety partnerships, continues to engage key national organizations to promote motorcycle awareness to their members, while also encouraging these organizations to include safety awareness messages in their material, as appropriate.

Congress requested that NHTSA examine ways to enhance motorcycle conspicuity. NHTSA's efforts to increase motorcycle safety were conducted in two phases and designed to test the speed-spacing and conspicuity hypotheses. The first phase was a test track evaluation in which participants in a vehicle pressed a button at what they perceived was the last moment they could safely cross the path of the experimental motorcycle approaching them. The intention of this phase was to determine which, if any, treatments influenced drivers to provide a safer gap. The second phase contained two parts: an on-road assessment of gap acceptance and an interview. The goal of this phase was to determine if any of the treatments provided a safer gap in real traffic and if any of the treatments were more conspicuous. Testing was conducted in the United States and Canada to allow an assessment of the impact of passenger fleet daytime running lamp (DRL) use.

DRLs on motorcycles have been found to increase motorcyclist conspicuity. One possible explanation for drivers turning in front of oncoming motorcycles involves a decrease in motorcyclist notice-

ability due to increasing use of DRLs in the passenger car fleet. The on-road assessment was used to examine the effects of driver familiarity with motor vehicle DRLs.

In addition to DRLs, other technologies have emerged with the intent of increasing the conspicuity of motorcycles. For example, modulating headlamps have been shown to increase visibility. The study implemented some of these new treatments as test conditions. The findings are currently being reviewed.

## *Proposed Initiatives*

As required in SAFETEA-LU, NHTSA is developing model language for use in traffic safety education courses, driver's manuals, and other driver's training materials, emphasizing and instructing drivers of motor vehicles of the importance of sharing the road safely with motorcyclists.

In addition, NHTSA is working to implement SAFETEA-LU's new Section 2010 grant program established a State motorcyclist safety grant program to support motorcycle rider training and motorist awareness programs. SAFETEA-LU specifies that to qualify for a motorcyclist safety grant, in the first year a State must meet one of six criteria, and for the remaining three years the State must meet two of six criteria. The criteria are: (1) motorcycle rider training course; (2) motorcyclists awareness program; (3) reduction in fatalities and crashes involving motorcycles; (4) impaired driving program; (5) reduction of fatalities and accidents involving impaired motorcyclists; and (6) fees collected from motorcyclists for the purpose of funding training and safety programs are used only for those purposes. Funds can only be used for motorcyclist safety training and motorcyclist awareness programs. Funding includes a minimum of \$100,000 per year for qualifying States (\$6 million for FY 06, 07, and 08; \$7 million for FY 09).

To increase motorcycle conspicuity, NHTSA is currently conducting more analyses on the data collected to better understand the research needs and understand the full interaction with the vehicle fleet.

### ***Expected Program Outcomes***

The SAFETEA-LU motorcyclist safety grant program will provide resources to States to make improvements to their motorist awareness and rider education programs and increase availability of training.

Through NHTSA's research and testing efforts, the agency hopes to gain insight into the interaction of motorcycle DRL treatments and DRL concentration in the vehicle fleet. These efforts are also expected to provide understanding of real-world interactions between passenger vehicles and motorcycles.

## **G. Braking**

It is important to monitor the motorcycle crash experience to facilitate identification of potential factors that may hamper safe operation and rider safety. Motorcycle designs, including their brake systems, have changed significantly over the past 20 years. Motorcycle brake systems, and the riders' misuse/underuse of these systems, are potential factors in many crashes. Two promising technologies are available in production motorcycles: antilock brake systems (ABS); and combined braking systems (CBS) that apply the brakes on both wheels when only one lever/pedal is applied.

### ***Background on Issue***

In single-vehicle motorcycle crashes, about 13 percent of fatalities have been related to a braking maneuver used prior to the crash. However, available data does not indicate if motorcycle braking performance was a contributing factor in these crashes. A primary interest will center on determining whether present Federal requirements for effective braking action need to be revised to more closely reflect new technology already available in the marketplace. A major issue will involve evaluation of how changes in motorcycle operation and design features affect rider safety and performance.

### ***Highlights of Current Program***

NHTSA is currently investigating the benefits of newer braking technologies for motorcycles. The objective of this program is to assess the effective-

ness of anti-lock braking systems (ABS) and combined brake systems (CBS) on motorcycles under various braking maneuvers and loading conditions, and to determine the benefits that these systems may offer.

Program results indicate that an overall reduction in stopping distance can be achieved with the use of ABS. Results also indicate an overall reduction in stopping distance with CBS when only the foot pedal is applied. Another byproduct of CBS is that more consistent stops can be achieved when only the rear brake is applied. All results were compared with "baseline" performance of standard hydraulic brakes (i.e., no ABS or CBS).

### ***Proposed Initiatives***

Future brake testing may include performing additional tests of motorcycles (i.e., different brands/models) with ABS and/or CBS. There is also interest in performing a behavioral study with motorcyclists on motorcycles equipped with standard brake systems (baseline), and ABS/CBS-equipped motorcycles.

### ***Expected Program Outcomes***

This initiative will determine how certain brake technologies may assist in reducing the total number of annual motorcycle injuries and fatalities, how riders interact with the different braking technologies, and determining other benefits and effects of ABS/CBS.

## **H. Roadway Infrastructure**

Motorcycles have different operating characteristics than passenger cars and trucks. Motorcyclists are justifiably concerned about the effects of roadway infrastructure smoothness on motorcycle handling and operational safety.

### ***Background on the Issue***

Run-off-road (ROR) crashes pose a major danger to motorcyclists. ROR crashes involve vehicles that leave the travel lane and encroach onto the shoulder and beyond and hit one or more objects, such as bridge walls, poles, embankments, guardrails,



parked vehicles, and trees. Motorcycles are more likely than other vehicles to be involved in a fatal collision with a fixed object. In 2004, 26 percent of the motorcycles involved in fatal crashes collided with fixed objects, compared to 18 percent for passenger cars, 12 percent for light trucks, and 4 percent for large trucks.

Reducing the likelihood that a vehicle will leave the roadway through roadway design (e.g., flattening curves or installing shoulder rumble strips) prevents deaths and injuries resulting from ROR crashes. When an errant motorcycle does encroach on the roadside, fatalities and injuries can be reduced by minimizing the likelihood of the vehicle crashing into an object (e.g., through object removal) or overturning (e.g., sideslope flattening) or can reduce the severity of the crash (e.g., by installing breakaway devices).

### *Highlights on the Current Program*

FHWA, through the Federal aid and Federal land highway programs, provides financial and technical resources to State, local, and other Federal

agencies for the improvement and preservation of America's highway system. The design, construction, operation, and preservation of the roadway relating to motorcycle safety are of prime concern to FHWA.

On the engineering front, FHWA conducts research and supports private sector research into a variety of innovative design features that create safer roads. Road safety design features that help to reduce road departures and minimize the severity of roadway crashes include: rumble strips; retro-reflective signs and forgiving roadside hardware (i.e., guardrails and breakaway poles); skid resistance pavements; and all-weather pavement markings.

### *Proposed Initiatives*

NHTSA will continue to support FHWA's efforts in analyzing the current and future roadway issues in identifying specific actions to improve safety. In addition, receiving input on roadway infrastructure related safety issues from the motorcycle community is crucial for an effective program to be planned by both NHTSA and FHWA. FHWA



has already initiated actions to address motorcycle safety needs relating to the roadway infrastructure. FHWA, working in partnership with the AMA, has taken steps to improve roadway surfaces through guidance regarding use of non-slippery road sealants, repair substances, and road marking decals. This has been carried out in combination with educational campaigns.

In addition, the FHWA, in cooperation with NHTSA, will continue to work with the Transportation Research Board (TRB) and others on the implementation of the American Association of State Highway and Transportation Officials' Strategic Highway Safety Plan (SHSP) (<http://safetyplan.tamu.edu>). The purpose of SHSP is to improve safety on the Nation's highways through a comprehensive approach (enforcement, engineering, education, and emergency medical services) with input and participation from many organizations and individuals. The guide will contain engineering, as well as educational, enforcement, and emergency medical services to improve motorcycle safety. As a part of this effort, FHWA will coordinate with NHTSA on the appropriate outreach and distribution activities for the Guide.

Lastly, Section 1914 of SAFETEA-LU authorized the creation of a Motorcyclist Advisory Council to coordinate with and advise the FHWA administrator on infrastructure issues of concern to motorcyclists. FHWA published a notice of intent to establish the council that was included in the Federal Register on December 23, 2005 (70 FR 76352). The notice sought public comments on the issues the council should discuss and the organizations and participants to be considered for representation to the council.

### *Expected Program Outcomes*

One expected outcome of improving roadway infrastructure is to reduce the number of motorcycle ROR fatality crashes. NHTSA and FHWA plan to do this by continuing to develop and implement programs and infrastructure to keep vehicles from encroaching on the roadside, minimize the likelihood of crashing if a motorcyclist travels off the shoulder, and reduce the severity of the crash.

## V. International Efforts

NHTSA recognizes the increasing demand and need for involvement in the international arena of traffic and vehicle safety. There are opportunities to learn from other countries, as well as share strategies and good practices for increasing motorcycle safety. Section 2003 of SAFETEA-LU authorizes the NHTSA administrator to “participate and cooperate in international activities to enhance highway safety.” This increased need for international cooperation on motorcycle safety issues, as well as other highway safety matters, is due to changing national and international trends in automotive safety and trade. The changing trends require international cooperation to learn about better safety practices and to leverage limited resources. It is also due to increasing statutory and international treaty obligations. Further, research and standard setting activities outside the United States, even those occurring without the involvement or influence of the U.S. Government, may affect the design and safety of vehicles, including motorcycles, sold in the United States.

Currently, NHTSA represents the United States in the United Nations Economic Commission for Europe (UNECE) Working Party on Road Traffic Safety (called WP.1). WP.1 is a well-established United Nations body within the UNECE Transport Division, focusing on reducing the number and gravity of road traffic crashes. UNECE and its Working Parties, including WP.1, serve as focal points for the exchange of information and development of policy recommendations regarding good practices in the vehicle, behavioral, and infrastructure areas of traffic injury prevention. This is important given NHTSA’s limited resources for international activities. NHTSA currently chairs a WP.1 working group to identify international practices in motorcycle and moped safety.

NHTSA is also actively working with the UNECE World Forum for Harmonization of Vehicle Regulations (called WP.29) to develop a harmonized

Global Technical Regulation (GTR) for motorcycle brakes. The work was initiated in March 2002 by the Executive Committee (called AC.3) responsible for global harmonization activity under this forum, during the 126th session of WP.29. The development of the new global regulation is intended to reduce the injuries and fatalities associated with motorcycle accidents both in the United States and around the world. The body under WP.29 responsible for the technical work, called the Working Party on Brakes and Running Gear (GRRF) is in the final stages of its work and is expected to recommend establishment of the new GTR to WP.29 by the end of 2006.

NHTSA participates in the United Nations Road Safety Collaboration, coordinated by the World Health Organization per General Assembly Resolution A/58/289, Improving global safety,” adopted in April 2004. This collaboration consists of over 70 international and national agencies in road safety, focusing on successful interventions for powered two-wheeled vehicles, speeding, impaired driving, and occupant protection and is developing a series of tool kits on implementation strategies. NHTSA will continue to participate with the collaboration and review toolkits as appropriate.







# VI. Conclusion

The increasing trend in motorcycle fatalities and injuries calls for new strategies as well as the expansion of existing programs. There have been periods of major improvement in motorcycle safety, especially since the implementation of Federal laws and programs that were first established over 35 years ago. But continued escalating fatality and injury trends signal that more needs to be done and areas of focus must be expanded.

NHTSA's Motorcycle Safety Program promotes the Department of Transportation's highest priority – safe transportation. It includes brief synopses of the many activities the agency will pursue in reducing the number of motorcycle crashes, fatalities,

and injuries. NHTSA's motorcycle safety program is a balanced and comprehensive approach to: (1) prevent crashes before they occur; (2) mitigate and reduce crash-related injuries; and (3) provide rapid and appropriate emergency response.

The problem of motorcycle fatalities and injuries is not NHTSA's alone to solve. To reduce the needless injuries and deaths on our Nation's roadways, NHTSA urges States, local jurisdictions, national organizations, rider groups, manufacturers, insurers and all individuals – riders and drivers – to take responsibility for this growing problem by doing everything in their power to ensure a safe and enjoyable ride for all motorcyclists, every trip, every time.











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