

The National Highway Traffic Safety Administration

Motorcycle Safety Program



U.S. Department of Transportation
National Highway Traffic Safety
Administration

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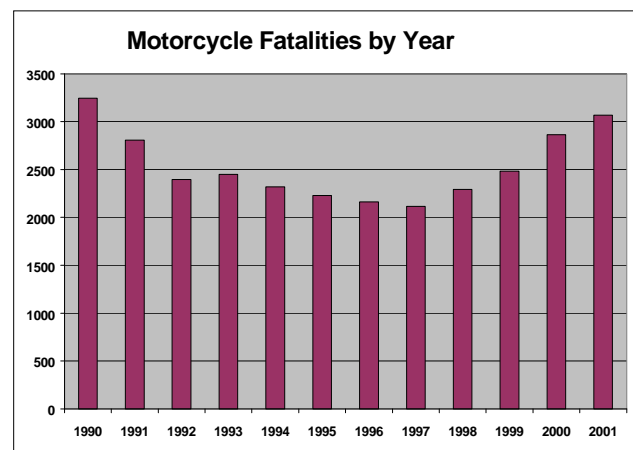
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I. INTRODUCTION¹

Despite significant gains since the enactment of Federal motor vehicle and highway safety legislation in the mid 1960's, the annual toll of traffic crashes remains tragically high. In 2001, the National Highway Traffic Safety Administration's (NHTSA's) Fatality Analysis Reporting System (FARS) and General Estimates System (GES) revealed that approximately 42,116 people were killed and another 3.03 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 individuals ages 4 through 33. 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, or an average of \$820 for every person living in the United States.²

Recent data indicate that deaths and injuries attributable to motorcycle crashes are becoming a larger portion of this grave public health problem. Motorcycle crash-related fatalities have been increasing since 1997, while injuries have been increasing since 1999. More than 100,000 motorcyclists have died in traffic crashes since the enactment of the Highway Safety Act and the National Traffic and Motor Vehicle Safety Act of 1966. Like other road users who 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 the ride safe by taking operator training, wearing protective gear, and riding sober.



The effects of a crash involving a motorcycle can often be devastating. While 20 percent of passenger vehicle crashes result in injury or death, an astounding 80 percent of motorcycle crashes result in injury or death. According to NHTSA's data, while total traffic deaths increased by four tenths of a percent in 2001, motorcycle deaths were up by 10 percent, compared to 2000. Motorcyclist fatalities have increased each year since reaching an historic low of 2,116 fatalities in 1997. In 2001, 3,181 motorcyclists were killed, an increase of over 50 percent between 1997 and 2001. Without this substantial increase in motorcyclist fatalities between 1997 and 2001, overall highway fatalities would have experienced a marked reduction of about 2.5 percent over this same time period, see Table 1.

¹ For all trend data contained within this program plan see – Shankar, Umesh. (June 2001). *Recent Trends in Fatal Motorcycle Crashes*. (DOT HS 809 271). Washington D.C.: National Highway Traffic Safety Administration and *Traffic Safety Facts 2001 – Motorcycles*, (DOT HS 809 473). Washington, D.C.: National Highway Traffic Safety Administration.

² Blincoe, Larry. (May 2002). *The Economic Impact of Motor Vehicle Crashes, 2000*, (DOT HS 809 446). Washington, D.C.: National Highway Traffic Safety Administration.

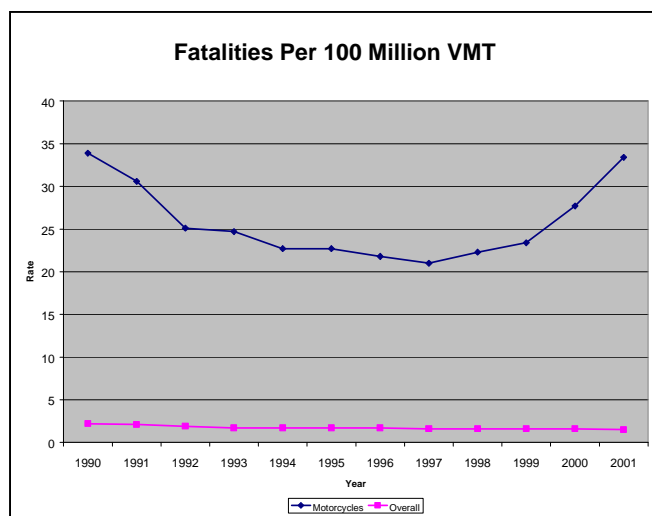
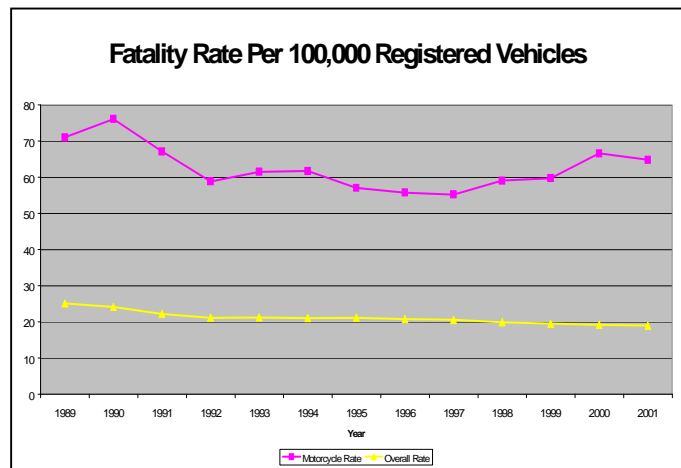
Table 1. Total Fatalities vs. Motorcyclist Fatalities By Year, 1997-2001

Fatalities	1997	1998	1999	2000	2001
Total	42,013	41,501	41,717	41,945	42,116
Change	---	-512	+216	+228	+171
Motorcyclists	2,116	2,294	2,483	2,897	3,181
Change	---	+178	+189	+414	+284
Motorcycle Percent of All Fatalities	5.0	5.5	6.0	6.9	7.6

Source: NHTSA, NCSA: FARS

II. RECENT TRENDS

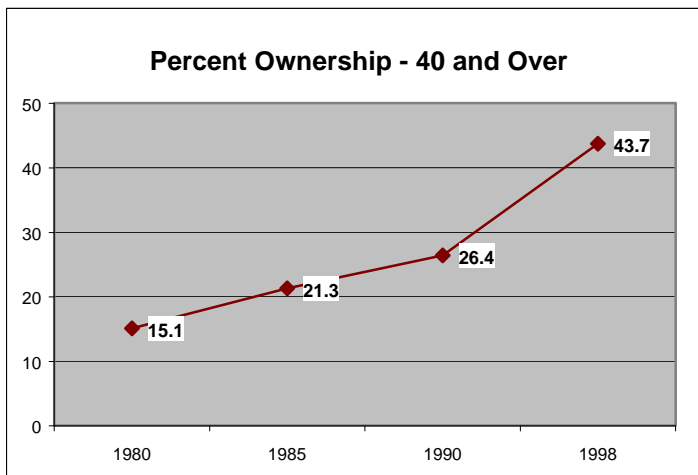
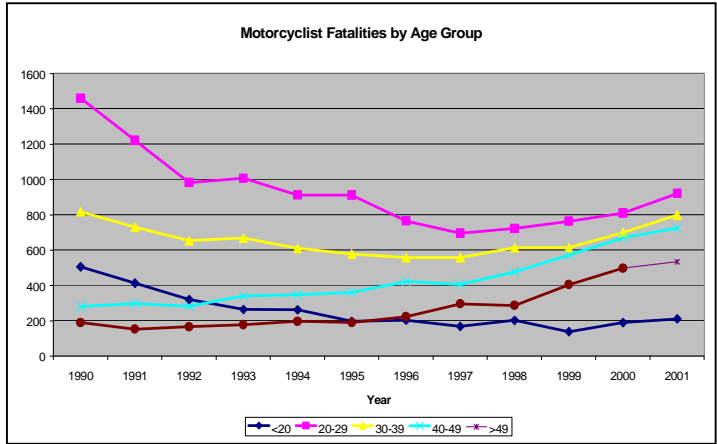
The motorcycle community is experiencing astounding growth. New unit sales of on-highway motorcycles have increased approximately 91 percent since 1997. In 2001, motorcycles represented 2.2 percent of all registered vehicles in the United States and accounted for 0.34 percent of vehicle miles traveled, but crashes involving motorcycles accounted for 7.6 percent of total traffic fatalities on America’s roadways. The Motorcycle Industry Council (MIC) expects motorcycle sales to continue to increase over the next 5 to 7 years – meaning more motorcycles on our Nation’s roadways. MIC estimates that 471,000 new on-highway motorcycles were sold in the United States in 2000 alone compared to 379,000 in 1999.³



Exposure, measured in terms of vehicle miles of travel (VMT) in 2001, shows that motorcyclists were about 26 times as likely to die in a crash than someone riding in a passenger car, and are 5 times as likely to be injured. This is a steep increase from 1997, when motorcyclists were 14 times as likely to die in a crash than someone riding in a passenger car. Per registered vehicle, the fatality rate for motorcyclists in 2001 was 4.1 times the fatality rate for passenger car occupants. The injury rate for passenger car occupants per registered vehicle was 1.2 times the injury rate for motorcyclists.

³ 2001 Motorcycle Statistical Annual, Motorcycle Industry Council (MIC).

A recent analysis of age trends shows that over the past 10 years, fatalities in the 20 to 29 year old age group, the group with consistently the highest annual number of motorcycle fatalities, decreased, while fatalities in the 40 and over age groups increased. During this time, however, there were more driving age individuals in the 40 and over age group in the United States.



Since 1980, motorcycle ownership among the 40 and over age group has increased significantly, from 15.1 percent in 1980 to 43.7 percent in 1998.⁴

Likewise, rural motorcycle fatalities have been increasing and have, in fact, surpassed urban fatalities in the years 1998 through 2001.

Another recent trend indicates that the engine size of the majority of the motorcycles involved in fatal crashes has been increasing, as well.

The mean engine displacement of the motorcycles involved in fatal crashes has increased from an average engine size of 769 cc in 1990 to 959 cc in 2001, an increase of 24.7 percent.

Further, the mean age of motorcyclists' fatalities has also increased from 29.3 years in 1990 to 36.3 years in 2001. The analysis also indicates a corresponding rise in the average age of motorcyclists killed and greater involvement of motorcycles with larger engines in fatal crashes.

According to NHTSA's National Occupant Protection Use Survey (NOPUS), a nationally representative observational survey of motorcycle helmet, safety belt, and child safety seat use, helmet use for motorcycle operators fell from 71 percent in 2000 to 58 percent in 2002. This drop is statistically significant and corresponds to a striking 45 percent increase in nonuse.

Rider impairment and speeding also remain major contributing factors in these unnecessary and preventable crashes (both are discussed in greater detail later in this document); however, some other findings extracted from FARS provide further insight into possible reasons for escalating motorcyclist fatalities:

⁴ See *id.*

- Half of the fatalities in single vehicle crashes relate to problems negotiating a curve prior to a crash;
- Over 80 percent of motorcycle fatalities in single vehicle crashes occur off the roadway (a crash occurring on the shoulder, median, roadside, outside right-of-way, off roadway – location unknown, in a parking lane, separator and gore. A gore is an area of land where two roadways diverge or converge.);
- Almost 60 percent of motorcyclist fatalities in single vehicle crashes occur at night;
- Collisions with fixed objects are a significant factor in over half of motorcycle fatalities in single vehicle crashes.

The increase in motorcycle-related deaths and injuries calls for new program actions to supplement existing initiatives. 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 escalating fatality and injury trends sound a warning trend. Motorcyclists age 40 and over riding larger motorcycle engine sizes account for the fastest growing group of motorcyclist fatalities. Fatalities on undivided, rural roadways have also increased significantly. The agency has not determined why there have been alarming increases in fatalities. This unfortunate reversal is occurring while overall traffic deaths remain at historic lows.

III. NHTSA'S KNOWLEDGE BASE

NHTSA has collected and analyzed data on motorcyclists 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 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, the Motorcycle Industry Council, the Federal Highway Administration, and the United States Census Bureau in exploring the recent increases in the number of motorcyclist fatalities.

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

In 1999, with motorcyclist fatalities in single vehicle crashes accounting for almost half (46 percent) 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, a census of all fatal motor vehicle crashes.

While NHTSA has a considerable knowledge base, the data analysis still does not get to the heart of the problem, or answer the question as to *why* motorcycle fatalities are on the rise. From

recent data analysis, NHTSA has learned who is crashing and also where most motorcycle crashes occur, but needs to determine why older riders with bigger bikes on our Nation's rural roadways are the fastest growing group of fatalities. However, 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?

As a means of addressing some of these basic questions, NHTSA is pursuing the following motorcycle safety program to supplement the *National Agenda for Motorcycle Safety (National Agenda)*, discussed below, to improve upon the major problems facing the motorcycling community, while also addressing safety issues emerging on the horizon.

IV. NHTSA'S MOTORCYCLE SAFETY PROGRAM

In 1997, NHTSA partnered with the Motorcycle Safety Foundation (MSF), a National, nonprofit organization promoting safer motorcycling, to provide the leadership and resources to create the *National Agenda for Motorcycle Safety (National Agenda)*. The *National Agenda* is a strategic planning document intended to provide 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 experts in industry, research, training, and 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. The document also 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 safety.

Note: The recommendations in the National Agenda 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.

Since the release of the *National Agenda* in December 2000, motorcycle fatalities have continued to increase. The *National Agenda* 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. Data from 2000 and 2001 revealed new and recent emerging trends involving rises in rural versus urban fatalities and deaths among older riders on larger motorcycles. These trends were not known and, consequently not addressed in the *National Agenda*. NHTSA's *Motorcycle Safety Program* aligns with the *National Agenda* on some efforts, but also focuses its efforts on the more recent trends revealed by the 2000 and 2001 data.

This document centers on crash prevention, which offers the greatest potential safety benefit for motorcyclists, while also addressing injury mitigation and emergency response. The *Motorcycle Safety Program* encompasses 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 addresses issues of roadway design that can enhance operator safety. The program builds on current and past efforts, and also addresses a number of concerns raised in the *National Agenda*. It presents the priorities and specific program initiatives that NHTSA intends to pursue in the near and long terms. The document is also consistent with NHTSA’s statutory responsibilities in promoting greater motorcycle safety.

As with other traffic safety programs, NHTSA’s *Motorcycle Safety Program* is based on a comprehensive approach, as shown in Table 2, that works to: (1) prevent motorcycle crashes; (2) mitigate rider injury when crashes do occur; and (3) provide rapid and appropriate emergency medical services response and better treatment for crash victims. The problems and proposed initiatives are organized according to the Haddon Matrix, which is composed of three time phases of a crash event (Crash Prevention – Pre-Crash, Injury Mitigation – Crash, and Emergency Response – Post-Crash), along with the three areas influencing each of the crash time phases (Human Factors, Vehicle Role and Environmental Conditions).

Table 2: NHTSA’s Motorcycle Safety Program⁵

	Human Factors	Vehicle Role	Environmental Conditions
Crash Prevention (Pre-Crash)	<ul style="list-style-type: none"> - Rider Education/Licensing - Impaired Riding - Motorist Awareness - State Safety Programs 	<ul style="list-style-type: none"> - Brakes, Tires, and Controls - Lighting and Visibility - Compliance Testing and Investigations 	<ul style="list-style-type: none"> - <i>Roadway Design, Construction, Operations and Preservation</i> - <i>Roadway Maintenance</i>
Injury Mitigation (Crash)	<ul style="list-style-type: none"> - Use of Protective Gear 	<ul style="list-style-type: none"> - Occupant Protection 	<ul style="list-style-type: none"> - <i>Roadside Design, Construction, and Preservation</i>
Emergency Response (Post-Crash)		<ul style="list-style-type: none"> - Automatic Crash Notification 	<ul style="list-style-type: none"> - Education and Assistance to EMS - Bystander Care - Training for Law Enforcement - Data collection & analysis

Challenges

While NHTSA is anxious to find effective solutions to this major public health problem – funding and greater activism are key. Our ultimate objective for all road users, including motorcyclists, is to reduce motorcycle-related fatalities and injuries. However, in working to improve motorcycle safety NHTSA faces major challenges – challenges in terms of limited

⁵Activities shown in italics are either implemented jointly with, or conducted by, FHWA.

financial resources and balancing the competing priorities of other critical traffic safety issues. Most of the planned activities are directly linked to financial resources available to combat this growing problem. NHTSA's planned activities, to date, to improve motorcycle safety, are discussed in the next section of this program. The agency will continue to partner with FHWA and the motorcycle and traffic safety communities to improve, not just motorcycle safety, but highway safety overall. 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.

Motorcycle safety is traditionally promoted by the agency through highway safety grants to States, technical assistance, specific safety initiatives, data collection and analysis, and safety standards designed to contribute to safe operation and rider protection. NHTSA has allocated resources to support these broad initiatives since the agency's inception in the late 1960's. NHTSA's aim has remained one of intensifying the focus it brings to safety problems inherent in operating motorcycles. Its approach entails safety leadership, nationally and internationally. NHTSA works to encourage safety efforts by all segments of the United States motorcycling community, and it collaborates with international organizations and governments as well, and will continue to do so. The agency values its partnerships with stakeholders in the motorcycle manufacturing and aftermarket industries, as well as the rider and education communities. However, efforts by interested parties in this community face difficult challenges in working to improve motorcycle safety. Although National data show that trends in crashes involving motorcycles shift over time, the big issues surrounding motorcycle safety - such as rider protection during crashes, the need for more and improved rider training, and the impairing effects of alcohol - are extant from year to year. NHTSA views interaction with stakeholders as a crucial means to allow it to collaborate on how to best improve these and other issue areas affecting motorcycle safety. Personal protective gear, rider education and training, and riding sober are the best defenses to prevent crashes and mitigate injuries when a crash does occur. Like other road users who are urged to protect themselves, and others, from injury or death by wearing safety belts, driving unimpaired, and observing traffic rules, motorcyclists must ensure that they have done everything possible to make the ride safe by taking training, wearing protective gear, and riding alcohol and drug free.

Motorcycle organizations, as well as NHTSA, are increasing their activities aimed at reducing motorcyclist fatalities. For instance, MSF has announced the establishment of a grassroots-oriented, small-award grant program to help support the implementation of the recommendations of the *National Agenda*. The program enables any person, organization, or business to submit an application with award amounts ranging from \$1,000 to \$10,000 to institute programs that will be recognizable, measurable and have immediate returns. In addition to supporting the implementation of the *National Agenda*, MSF has offered to provide free training and education materials to state motorcycle safety and highway safety offices, event planners, enthusiast organizations and others to promote Motorcycle Safety Awareness Month, which occurs each May.

In showing its commitment to carrying out its safety mandate, NHTSA published a draft Motorcycle Safety Improvement Plan in the Federal Register on June 25, 2001. The agency received 78 comments on the plan. Several comments expressed the need for in-depth research

into the causes of motorcycle crashes. Other comments included the need for more rider education and other motorist awareness courses, while some dealt with the issue of mandatory helmet laws for all riders. The following describes NHTSA's program.

A. CRASH PREVENTION

Preventing crashes before they occur is a major component of any comprehensive traffic safety program, including motorcycle safety. NHTSA's crash prevention activities will have a significant focus on variables that affect and contribute to crashes – operator fitness, experience and training, and licensing. Operator impairment alone is a contributing factor in more than half of all fatal-single vehicle motorcycle crashes. The agency supports effective State rider education and training programs and encourages proper licensing for all motorcyclists. NHTSA also promotes “share the road” and other motorist awareness efforts to raise the motoring public's awareness of the various mix of vehicles and non-vehicle users using the Nation's roadways.

RESEARCH AND DATA COLLECTION EFFORTS

NHTSA's FARS data provide information on *who* is involved in motorcycle crashes, but it does not provide information on *why* a motorcyclist becomes crash involved. Collecting and analyzing data on rider education and training, licensing, length of time riding a motorcycle and specific attributes of the motorcycle being operated, riding habits – alone or in a group, and other similar data are key to answering this fundamental question to assist in crash prevention. NHTSA's research efforts will also 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.

NHTSA's Research and Data Collection Efforts Program:

- *Conduct Research to Determine Motorcycle Operator Characteristics.* The agency will undertake research to 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, and licensing status. Ultimately, the collection and analysis of these data, when combined with other information, should enable NHTSA to improve the types of countermeasures developed for reducing the occurrence of injury producing crashes.

Targeted completion date – March 2004

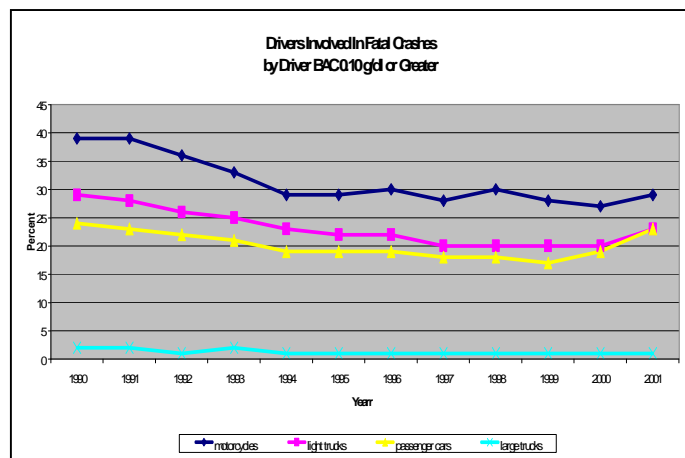
- *Study of Rehabilitation Costs Associated with Motorcycle Crash Related Injuries.* Data are needed on rehabilitation costs of injuries resulting from motorcycle crashes. NHTSA is examining the rehabilitation costs associated with injuries received as a result of motorcycle crashes to provide a more complete picture of costs associated with motorcycle crashes. One of the products of this project is a model for estimating

rehabilitation costs resulting from motorcycle crashes and adapting this model so that it can be applied to all motor vehicle crashes. **Targeted completion date – December 2004**

- *Study Crash Risk.* The current status of situational and behavioral errors or factors associated with motorcycle crashes remains unknown. Also, crash risk and riding behaviors for different target groups need to be examined further. The findings from this study will be compared with databases containing information for motorcyclists who are involved in crashes, especially those who are 40 years of age and older, due to their increasing involvement in crashes. **Targeted completion date – March 2005**
- *Conduct a Vehicle Crash Causation Study Including Motorcycle Crashes.* NHTSA is considering an update to its previous motor vehicle crash causation study, the 1979 Indiana Tri-Level Causal Analyses study. The agency plans to collect crash causation data on motorcycles as part of this study. This research will assist NHTSA in addressing a number of critical safety questions including “why” there has been a substantial increase in motorcycle crashes and operator fatalities especially among riders 40 and over, as well as the growing popularity of larger motorcycles and their increased involvement in crashes. An updated motor vehicle crash causation study will aid NHTSA researchers in identifying and creating new initiatives for their crash avoidance and countermeasures programs. **Targeted completion date – September 2009.**

RIDER IMPAIRMENT

Like operators of other vehicles, motorcycle operator impairment, mainly from the use of alcohol, is a serious problem. In 2001, motorcycle operators in fatal crashes had higher intoxication rates than any other type of driver. Twenty-nine percent of fatally injured motorcycle operators were intoxicated at 0.08 g/dl or greater blood alcohol concentration (BAC), and another 7 percent were reported to be at BAC 0.01 to 0.07 g/dl. In single vehicle motorcycle crashes, 41 percent of the fatally injured motorcyclists were intoxicated with a BAC \geq .08 g/dl.



The agency has set a goal of reducing the alcohol-related highway fatality rate to no more than 0.53 per 100 million VMT by the end of 2003. In 2001, the alcohol-related fatality rate from all motor vehicle crashes was 0.63 per 100 million VMT. In 2001, the alcohol-related fatality rate from motorcycle crashes was 14.3 fatalities per 100 million VMT, or 22.7 times higher than the rate for all motor vehicles.

The risk entailed in drinking and then riding is exacerbated by other risk-taking behaviors, such as riding without the proper protective gear, including protective clothing and a motorcycle helmet. Data indicate that in 2001, only 40 percent of intoxicated motorcycle operators killed wore helmets, compared with 60 percent for those who were sober. The intoxication rate was highest for fatally injured operators between 40 to 44 years old (42 percent), followed by ages 35 to 39 (40 percent) and ages 30 to 34 (35 percent). More than 5 percent of motorcycle operators in fatal crashes in 2001 had at least one prior conviction for driving while intoxicated on their driver records, compared to fewer than 4 percent of passenger vehicle drivers.

From 1990-1999, half of all riders killed on motorcycles with 1001-1500 cc engine sizes had alcohol in their blood (11% BAC 0.01-0.09, 39% BAC 0.10+). Two-thirds of 30-39 age group riders killed on undivided roadways were speeding and using alcohol, with 55 percent having at least BAC 0.10 g/dl.

A recent 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 nearly always overshadows concern for individual safety and contributes to drinking and riding (i.e., leaving the motorcycle and getting home an alternative way); 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.

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. The agency will continue to work with law enforcement organizations at the National, State, and local levels to develop strategies to more aggressively enforce impaired riding laws. Moreover, NHTSA will work to ensure that impaired riding laws will be fully prosecuted and adjudicated. NHTSA will also work with National prosecutorial and judicial organizations to educate their members on impaired riding related issues.

NHTSA's Rider Impairment Program:

- *Complete Alternative Methodologies for Determining Alcohol Crash Risk Project.* NHTSA will assess the feasibility of alternative approaches to determine the relative risk of alcohol-impaired riders. The research project is intended to provide information regarding a variety of approaches (e.g. case-control method) that may be used to determine crash risks among riders who drink. **Targeted completion date – March 2003**
- *Conduct Pilot Tests of Recommendations from the Alternative Methodologies for Determining Alcohol Crash Risk Project.* The agency will pilot test the most feasible and effective data collection methodologies from the *Alternative Methodologies for*

Determining Alcohol Crash Risk project discussed above. **Targeted completion date – To be determined upon completion of *Alternative Methodologies for Determining Alcohol Crash Risk Project*.**

- *Conduct a Series of National Motorcycle Leadership Meetings to Address Impaired Riding.* The agency recognizes that it will take more than just public information and education to solve the impaired riding problem. Under the auspices of the *National Agenda*, NHTSA in partnership with MSF, will convene the National motorcycling organizations to discuss issues related to impaired riding and encourage the leadership to begin to make policy changes within their organizations to discourage the use of alcohol at sponsored events. **Targeted completion date – October 2003**
- *Complete Impaired Riding Demonstration Projects.* NHTSA will complete two demonstration projects that test different strategies designed to reduce the number of alcohol-related motorcycle crashes. Enforcement of existing impaired driving laws; providing safe rides home, not only for the motorcyclists but also for the motorcycle itself; and public information and education targeting motorcyclists and their family members are key components of these efforts in Minnesota and Hawaii. The results of these demonstration projects will be analyzed and provided to States to use in their programs to impact impaired riding. **Targeted completion date – December 2003**
- *Establish a Partnership with the American Motorcyclist Association (AMA) to Develop Education Messages and Prevention Strategies.* To reach motorcyclists at organized motorcycling events such as sanctioned AMA races, NHTSA entered into partnership with the AMA to develop specific impaired riding messages targeting motorcyclist event attendees to include the incorporation of NHTSA's current "*Friends Don't Let Friends Ride Drunk*" and "*You Drink & Drive-You Lose*" campaigns. Additionally, NHTSA will work with the AMA to provide alcohol server training to event management and race staff. Initial materials for this project will be released in Spring 2003. **Targeted completion date – August 2005**

RIDER EDUCATION AND TRAINING

NHTSA recognizes that there is an increasing demand for rider education and training courses and that some States have difficulty meeting this demand. Currently, 47 States have legislated rider education and training programs to provide education and training for those who seek it. Some States do mandate training for motorcyclists under a certain age (generally 18). However, many report that waiting times to complete a course range from 6 months to a year and there are also wide differences in program content and administration from State to State.

The agency works with MSF and the National Association of State Motorcycle Safety Administrators (SMSA) to provide assistance to States in developing, implementing, administering, and evaluating State motorcycle rider education programs. Through its regional offices, NHTSA will encourage each State to conduct a motorcycle safety program assessment (MSPA) and 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 delivery of its comprehensive motorcycle safety program. To further maximize resources, NHTSA worked with the SMSA to develop a forecasting methodology to enable State rider education and training programs to set goals to meet the increasing training demand, identify resources needed to meet that demand, and develop an action plan to serve as a blueprint for reaching rider education and training goals. This effort, in combination with the MSFs efforts to offer modified curricula to meet the needs of individual motorcyclists, should allow State rider education and training programs to increase capacity and address lengthy waiting lists. To complement these efforts, NHTSA's regional offices will work more closely with State rider education and training programs and State highway safety offices to foster partnerships with the private sector to identify and develop potential training sites to expand the availability of training to meet current and future demand. Nevertheless, like novice drivers who pay to receive driver's education to prepare them to operate a motor vehicle safely, motorcyclists also must be willing to consider paying for rider education and training.

NHTSA's Rider Education and Training Program:

- *Coordinate the Enhancement of State Motorcycle Safety Activities.* NHTSA's regional offices will facilitate the development of interdisciplinary working groups within each State to fully develop Statewide comprehensive motorcycle safety programs. Working groups representing highway safety, motorcycle rider education and training, licensing, law enforcement, research, health care, roadway and rider groups will be formed to discuss and plan future motorcycle safety efforts at the State level to positively impact the rising trend in motorcyclist fatalities. **Targeted completion date – Ongoing**
- *Examine State Rider Education and Training Programs.* To better understand how State rider education and training programs are administered, NHTSA has begun a study to review the policies and practices of each State's rider education and training program. Once completed, those States that have been identified as having the most efficient and effective program components will be highlighted and offered as models to be adopted by other States where possible. Identifying cost effective and efficient policies and practices is important in this era of competing financial resources, and will allow State rider education and training programs to maximize limited funding while continuing to meet increasing demand. **Targeted completion date – September 2004**
- *Link Rider Education Data with Crash Outcome Data.* The agency will support the Crash Outcome Data Evaluation States (CODES) Data Network as it links State rider training databases with existing CODES databases to collect and analyze data that provide a better understanding of the link between a rider's training history and crash involvement. Data analysis will include, but not be limited to, training status, injuries received and treatment/rehabilitation costs, emergency response data, and other variables important to analyze crash scenarios. **Targeted completion date – December 2005**

MOTORCYCLE OPERATOR LICENSING

Motorcycle operator licensing is another major component to a comprehensive motorcycle safety program. By obtaining a specialized motorcycle license, a motorcyclist demonstrates the

minimum ability to safely operate a motorcycle on the roadway. All 50 States require a motorcycle operator to obtain a license or endorsement to operate such a vehicle. Nearly one out of four motorcycle operators (27 percent) involved in fatal crashes in 2001 was not properly licensed (Improperly licensed defined as not licensed to operate a motorcycle, or a license suspended, revoked, expired, canceled or denied). Motorcycle operators involved in fatal traffic crashes were more than 1.4 times as likely as passenger vehicle drivers to have a previous license suspension or revocation (18 percent and 13 percent, respectively). 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.

NHTSA's Motorcycle Operator Licensing Program:

- *Examine State Licensing Programs.* As part of the rider education and training study discussed earlier, NHTSA is examining licensing practices in each State and the relationship between the rider education and training program and a State's licensing practices. To the extent possible, NHTSA will encourage 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. **Targeted completion date – September 2004**

MOTORIST AWARENESS ACTIVITIES

It is critical for motorists to learn to identify, and share the road safely with motorcyclists. This is an important element to NHTSA's motorcycle safety program. In 2001, there were 1,428 two-vehicle fatal crashes involving a motorcycle and another vehicle. In 36 percent (516) of these crashes, the other vehicle was turning left while the motorcycle was going straight or passing. 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. For example, roadway users may not provide motorcycle operators enough space or allow adequate reaction time to take crash avoidance maneuvers to avoid a hazard.

To educate motorists on learning to identify, and share the road with, motorcyclists, NHTSA, while enhancing its existing highway safety partnerships, plans to engage key National organizations to promote motorcycle awareness to their members, while also encouraging these organizations to include safety awareness messages in their materials, as appropriate. In addition to a motorcycle awareness message, the agency will work with appropriate organizations to promote messages that will discourage drinking and riding, while encouraging the use of personal protective gear.

NHTSA's Motorist Awareness Program:

- *Complete Motorist Awareness State Demonstration Projects.* The agency is nearing completion of motorist awareness activities in New York and Washington State to test how motorist awareness messages can affect the number of motorcycle crashes. New York's effort kicked off during the summer of 2001 and is known as the "Drive Right" campaign. Washington's efforts kicked off in the Spring of 2002. NHTSA plans to package the demonstration projects' templates, to make them available to State and community-based traffic safety organizations throughout the country. **Targeted completion date – October 2003**

MOTORCYCLE OPERATIONAL SAFETY: BRAKING AND CONSPICUITY

It is also important to monitor the motorcycle crash experience to facilitate identification of potential factors that may hamper safe operation and rider safety. Motorcycle designs have changed significantly over the past 20 years. Today, a majority of the motorcycles on our roadways are sport bikes and cruisers – models that did not exist in the 1970's. Engine sizes have increased, suspension systems have drastically changed and frame design and construction have improved. At the same time, fuel tanks have changed, the industry has experienced tire and wheel improvements and there has even been an introduction of interconnected brake systems. In single vehicle motorcycle crashes, about 13 percent of fatalities have been related to a braking maneuver used during the crash, even though braking performance may not have been a contributing factor in the crash. In addition, about 9 percent of the fatalities have been related to steering maneuvers. 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.

NHTSA's Motorcycle Operational Safety Program:

- *Study Motorcycle Braking Technological Advances, Quantify Braking Performance, and Conduct Benchmarking for Different Systems.* In the area of braking technology, braking systems are radically different in the current fleet. NHTSA will study two technological advances in the area of braking – linked brakes and anti-lock braking systems – in real-world situations as a means for determining overall effectiveness and judging whether major modifications must be made to motorcyclist training curriculum to accommodate their performance and adequately train new motorcyclists. In September 2002, NHTSA and Transport Canada started a joint research project on motorcycle braking. The objective of this testing program is to compare the levels of stringency of three motorcycle braking standards (FMVSS No. 122, ECE Regulation No. 78, and Japan Safety Standard 12-61). This program will also assess the effectiveness of ABS versus a non-ABS equipped motorcycle in various braking maneuvers, such as on dry pavement in a curve and in straight-line braking on a wet asphalt surface. The agency hopes to use the test data to support its motorcycle brake harmonization proposals. **Targeted completion date – 2004**

- *Analyze Available Crash Data and Conduct Appropriate Research to Consider Effective Countermeasures for Improving Motorcycle Conspicuity.* The agency will analyze available and relevant data to determine the need for conducting research on motorcycle conspicuity. If additional research is deemed necessary, it will address potential countermeasures for improving motorcycle conspicuity. Based on the research findings, the agency will decide if new requirements should be proposed in rulemaking. Possible rulemaking actions may include mandatory requirements for motorcycle daytime running lamps (DRLs), side marker lamps and modulating headlamps. **Targeted completion date – 2005**

ROADWAY INFRASTRUCTURE SAFETY

Motorcyclists are justifiably concerned about the effects of roadway infrastructure smoothness on motorcycle handling and operational safety. 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. 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 using non-slippery road sealants and repair substances. This has been carried out in combination with educational campaigns.

FHWA's Roadway Infrastructure Safety Program:

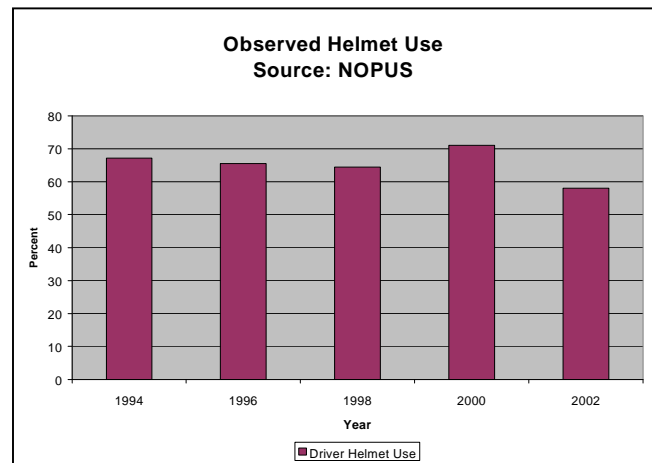
- **Develop Best Practice Guide for Improving Motorcycle Safety** (implementation of Strategy 11 of the AASHTO Strategic Highway Safety Plan through TRB Study 17-18). The FHWA, in cooperation with NHTSA, is working with the Transportation Research Board and others on the implementation of the American Association of State Highway and Transportation's Strategic Highway Safety Plan (SHSP) (<http://safetyplan.tamu.edu>). The purpose of the 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 SHSP has six main areas (driver, vulnerable users, vehicles, highways, EMS and management). In the vehicle areas is the strategy "Improving Motorcycle Safety and Increasing Motorcycle Safety Awareness" whereby an Implementation Guide to improve motorcycle safety is being developed. The guide will contain engineering, as well as educational, enforcement, and emergency medical services crash countermeasures to improve motorcycle safety. Upon completion of the Guide, FHWA will conduct a technology transfer and marketing activities as part of the overall SHSP implementation program. **Targeted completion date– August 2004**

B. INJURY MITIGATION

While crash prevention is the primary focus of NHTSA's motorcycle safety program, not all motorcycle crashes will be prevented. In light of this fact, injury prevention becomes an ever-increasing important component to reverse the upward trend in the number of motorcyclist fatalities each year. Injury mitigation stresses promoting the use of protective gear, including helmets that are compliant with Federal Motor Vehicle Safety Standard No. 218, Motorcycle Helmets (FMVSS No. 218) and supporting helmet usage laws governing riders of all ages.

MOTORCYCLE HELMET LAWS AND THE USE OF FMVSS 218 COMPLIANT HELMETS

Helmets worn as part of a motorcyclist's protective gear are known to be very effective in a crash. NHTSA estimates that helmets saved the lives of 674 motorcyclists in 2001, and that 444 more lives could have been saved if all motorcyclists had worn helmets. Reported helmet use rates for fatally injured motorcyclists in 2001 were 53 percent for operators and 41 percent for passengers, compared with 54 percent and 47 percent, respectively, in 2000. Helmets are estimated to be 29 percent effective in preventing fatal injuries to motorcyclists and 67 percent effective in preventing brain injuries.⁶



According to NHTSA's NOPUS, helmet use for motorcycle operators fell from 71 percent in 2000 to 58 percent in 2002. This drop is significant and corresponds to a striking 45 percent increase in nonuse. According to previous NHTSA surveys, helmet use was reported to be near 100 percent at sites with State helmet use laws governing all motorcycle riders, as compared to 34 to 54 percent at sites with no helmet use laws or laws limited to minors.

Today, 20 States, the District of Columbia, and Puerto Rico require helmet use by all motorcycle operators and passengers. In another 27 States, only persons under a specific age, are required to wear helmets. Three States have no laws governing helmet use.

Mandatory helmet use laws were first required as part of the agency's initial highway safety program standards issued in 1967. From the onset, helmet laws have been a contentious issue in many states as public policy makers have debated the balance between personal freedom and the societal cost of crashes. Those opposed to mandatory helmet laws generally argue that their individual rights are or will be infringed and that helmet use should be left up to the choice of

⁶ 1996 Crash Outcome Data Evaluation System (CODES): Report to Congress on Benefits of Safety Belts and Motorcycle Helmets.

individual riders. Those who advocate for helmet laws note that helmets are effective in reducing injury severity and that society bears a significant portion of motorcycle crash costs, thereby establishing a public interest in requiring the use of reasonable safety equipment. NHTSA estimates that \$13.2 billion was saved from 1984 through 1999 alone, because of the use of motorcycle helmets. An additional \$11.1 billion would have been saved if all motorcyclists had worn helmets.⁷

The cornerstone of the agency's injury mitigation component of its motorcycle safety program will be increasing the use of helmets that meet the FMVSS No. 218. NHTSA issued FMVSS No. 218, Motorcycle Helmets, on March 1, 1974, the performance standard, which establishes the minimum level of protection helmets must afford each user. All motorcycle helmets sold in the United States are required to meet FMVSS No. 218. FMVSS No. 218 has been amended twice, May 1, 1980, and on October 3, 1988. The 1980 amendment extended application of the standard to more helmets and the 1988 amendment added more test head forms and extended the standard's performance requirements to all helmet sizes and to improve test procedures.

While some States have chosen not to enact helmet laws for all riders, NHTSA will continue to work with the motorcycling, traffic safety, and health communities to educate and promote the voluntary use of helmets which meet FMVSS No. 218, along with the use of other types of personal protective gear as the last line of defense against serious injury for crash-involved motorcyclists. Wearing protective gear is the best weapon against injury when a crash does occur but many motorcyclists continue to ride with improper attire and non-compliant helmets or no helmet at all. Results of a study conducted in Florida indicate an increase in the use of noncompliant helmets.⁸ NHTSA's NOPUS survey found that noncompliant helmet use equated to 14 percent in 2000 and 2002 respectively. Noncompliant helmets in the marketplace have a negative impact on the enforceability of FMVSS No. 218 for law enforcement officers, on safety for the users, and on economics for the manufacturers of compliant helmets.

As part of a nationwide protective gear campaign, NHTSA will develop consumer information to better inform motorcyclists of the characteristics of compliant helmets and the lack of safety provided by noncompliant helmets. However, not all motorcyclists are the same. As such, an important component to this National protective gear public information and education will be to develop messages for the various segments of the motorcycling population. For example, messages may be developed for the population of motorcyclists who prefer to ride cruisers, touring, or sport bikes.⁹ In addition, the agency will promote the use of other protective gear that will increase conspicuity, mitigate injuries, and make the ride more comfortable for motorcyclists.

Meanwhile, NHTSA will work with appropriate National, State, and local law enforcement organizations to train law enforcement officers to identify noncompliant helmets while also developing training for judges and prosecutors to adjudicate helmet law violations. However, this task will prove challenging. Enforcing helmet laws that reference or incorporate FMVSS

⁷ *Traffic Safety Facts—Motorcycles*, (DOT HS 809 089), National Center for Statistics and Analysis (NCSA), 1999.

⁸ Turner, P.A. & Hagelin, C.A. (January 2000). *Novelty Helmet Use by Motorcycle Riders in Florida*, presented at the 79th Annual Meeting of the Transportation Research Board.

⁹ For a description of these motorcycle types see the *National Agenda for Motorcycle Safety*, pp 39-41.

No. 218 have been difficult for local and State law enforcement officers to enforce. The agency has received many complaints from law enforcement agencies across the country regarding officers' inability to prove a helmet is noncompliant under State law due to the accessibility of counterfeit DOT stickers. NHTSA will continue to provide technical assistance to States, when requested, with regard to legislation and laws relating to compliant helmet use.

NHTSA's Helmet Program:

- *Evaluate Effects of Helmet Law Repeals.* NHTSA will continue to conduct appropriate research and evaluation on activities related to motorcycle helmet use laws and helmet use. The harsh reality exposed by the State helmet law repeal evaluations has prompted NHTSA to continue to evaluate the effects of helmet law enactments and/or repeals. As NHTSA tracks motorcycle crash experiences in States that repeal their helmet laws, the agency will use the State motorcycle fatality data to publicize the protective value of helmet use. The results will assist policy makers at the State and local level to make appropriate decisions that are based on the best available scientific evidence. **Targeted completion date– Ongoing, As Needed.**
- *Propose Rulemaking to Upgrade FMVSS No. 218, Motorcycle Helmets.* NHTSA will consider proposing rulemaking to require that helmets offer better protection and be more comfortable to wear. **Targeted completion date– To Be Determined.**
- *Revise FMVSS No. 218's Labeling Requirements.* The agency is considering revising the standard's labeling requirement to strengthen the standard's enforcement effectiveness (e.g., to enable enforcement officers to distinguish noncompliant helmets from compliant helmets). **Targeted completion date – To Be Determined.**
- *Harmonize Helmet Requirements with Other National and International Standards.* The agency may also harmonize the performance and test requirements with other major international and National standards, where appropriate, for improving helmet performance based on safety need and for reducing helmet cost to consumers from more uniform helmet designs. **Targeted completion date– To Be Determined.**

C. EMERGENCY RESPONSE

After a crash has occurred, an injured rider's life can depend on rapid and appropriate emergency medical response. Emergency medical service (EMS) personnel provide medical support at the scene and during the transport to optimal emergency care facilities. NHTSA will continue to work with its partners to provide education and assistance to EMS professionals and the law enforcement community. Also, in ensuring that this information reaches the motoring public, NHTSA will expand outreach efforts to all motorists by working with medical and health care organizations. Similarly, the agency will work with motorcycling organizations to distribute bystander care information to motorcyclists nationwide. Bystander care information has proven to be very beneficial in the event of a motor vehicle crash. It assists crash victims by providing

bystanders with knowledge in reacting to a crash situation and seeking out appropriate emergency medical response.

NHTSA's Emergency Response Program:

- *Create Supplemental Bystander Care to Aid Injured Motorcyclists Materials.* NHTSA developed a National bystander care program, *First There, First Care* that includes awareness and training components. The *Awareness Program* is designed to encourage the public to stop and assist motor vehicle crash victims while the *Training Program* is a community based, hands-on training curriculum designed to increase knowledge and public confidence for assisting crash victims. For the general driving population, information will be provided to enable non-motorcyclists to properly secure the crash scene and tend to the immediate needs of an injured motorcyclist. Likewise similar supplemental materials, especially targeting motorcyclists, will be developed to provide lifesaving assistance at a crash scene for motorcyclists who may be riding in a group.

Targeted completion date – 2003

V. CONCLUSION

NHTSA's Motorcycle Safety Program promotes the Department of Transportation's highest priority – safe transportation. It includes only brief synopses of the many activities the agency will pursue in reducing the number of motorcycle crashes and the fatalities and injuries associated with these devastating incidents. The problem of motorcycle fatalities and injuries is not NHTSA's alone to solve. States, local jurisdictions, national organizations and individuals each have the responsibility for ensuring motorcycle safety. NHTSA's program focuses on crash prevention, which is the area that has the greatest potential to offer a safety payoff for motorcyclists but also addresses the areas of injury mitigation and emergency response. Personal protection is the best weapon against injury mitigation when a crash does occur, followed by rapid emergency response.

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