



Implementation Guide

National Agenda for *Motorcycle Safety*

National Agenda for Motorcycle Safety Implementation Guide Table of Contents

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Introduction

Purpose

The National Agenda for Motorcycle Safety (NAMS) is a comprehensive plan to improve United States motorcycle safety in the 21st century. The NAMS was developed by a Technical Working Group of experts representing all constituencies involved in motorcycle safety, led by the Motorcycle Safety Foundation (MSF) and the National Highway Traffic Safety Administration (NHTSA), and published in November 2000. Its 82 individual recommendations address the full range of topics and strategies relevant to motorcycle safety: human, vehicle, environmental, and social factors to prevent crashes, reduce injuries in crashes, and care for persons injured in crashes. The NAMS is available at www.nhtsa.gov or www.msf-usa.org. Appendix A of this guide lists the 82 NAMS recommendations in the order they appear in the NAMS.

Approximately half the NAMS recommendations are directed to States and communities. These NAMS recommendations provide overall goals and general methods for achieving these goals but do not suggest specific action steps. This guide attempts to fill this gap. Its purpose is to help State and community organizations improve motorcycle safety by implementing relevant NAMS recommendations.

The guide does not address the other half of the NAMS recommendations that are directed primarily to national agencies or organizations, including recommendations regarding research, program evaluation, data collection, regulation, motorcycle design and manufacture, and motorcycle operator insurance. These recommendations are critical. In particular, better data on motorcycle crashes and good current research on motorcycle crash causes, injury mechanisms, and potential countermeasures are crucial to reducing crashes and injuries. States and communities should not be expected to take the lead in implementing these recommendations.

Appendix B of this guide groups all 82 NAMS recommendations first by the audience to which they are directed and then by broad topic. Section A (States, communities, and rider groups) lists the recommendations included in this guide. Sections B through D list the recommendations directed to Federal agencies, motorcycle manufacturers, and insurance companies, respectively.

Organization and contents

The guide is organized into seven sections determined by the NAMS recommendations. Each section begins with a brief overview discussion and a single overall objective. Several strategies for achieving this objective, taken from the NAMS recommendations, are then listed. For each strategy, the guide lists potential action steps to implement the strategy: what could be done and who could do it. Then come promising practices: examples from States and communities that already are taking action to implement this strategy, with brief descriptions and contact information. The guide does not attempt to report every activity of every State or organization, especially when many States or organizations conduct similar activities. Each strategy concludes with resources and supporting activities: materials and other assistance for this strategy available to States and communities, again with contact information. The Table of Contents lists the seven sections and the individual strategies for each section.

Web links, contacts, and references

When possible, Web links and contact information are given for the promising practices, resources, and supporting activities. The NAMS itself is the primary reference for the entire guide. A few key references are provided for each section. Several general references covering more than one section are listed at the end of the Overview.

Audiences

The guide's primary audiences are State and community organizations concerned with motorcycle safety. These include:

- State highway safety offices;
- State agencies that license and train motorcycle operators and that register motorcycles;
- State and community law enforcement agencies;
- State and community motorcycle rider organizations, including chapters of ABATE, Gold Wing, and H.O.G.; and
- Motorcycle dealers and State motorcycle dealer organizations.

The guide provides a menu, not a recipe, for reducing motorcycle crashes and injuries. Each State and community must evaluate its own motorcycle safety issues and must decide which NAMS recommendations may help address these issues. The guide should help each State and community assess the range of potential strategies, investigate how these have been implemented through the promising practice examples, develop its own strategies and action plan, and acquire resources and other support for strategies it chooses to implement.

The guide's secondary audiences are national organizations that support or assist the activities of State and community organizations. These include:

- Federal government agencies, especially NHTSA;
- The Motorcycle Safety Foundation;
- Motorcycle manufacturers and the Motorcycle Industry Council;
- National motorcycle rider organizations, including the Motorcycle Riders Foundation (MRF) and the American Motorcyclist Association (AMA);
- National organizations and associations representing State agencies and other constituencies concerned with motorcycle safety, including the National Association of State Motorcycle Safety Administrators (SMSA), the Governors Highway Safety Association (GHSA), the International Association of Chiefs of Police (IACP), the National Sheriff's Association (NSA), and the American Association of Motor Vehicle Administrators (AAMVA); and
- Other national agencies, corporations, and organizations that may be able to assist some State and community motorcycle safety activities, such as organizations concerned with alcohol impairment or with driver training.

The resources and supporting activities sections for each strategy list some ways in which these organizations already support State and community motorcycle safety. This should help connect organizations offering support with States and communities who seek it. The objectives and strategies in this guide may prompt national organizations to consider other supporting activities.

Acknowledgments and disclaimers

This guide could not have been prepared without the help of many people.

- The NAMS itself, the working group that prepared it, and sponsors MSF and NHTSA, laid the foundation upon which this guide builds.
- A broad advisory panel assisted in developing the guide by defining topics and strategies, suggesting action steps, providing examples of promising practices, and reviewing drafts. Appendix C lists the panel members and their organizations, all of whom gave unqualified support.
- NHTSA conceived and funded the project. The NHTSA regional offices also reviewed the topics and strategies and provided many promising practice examples. Special thanks go to project monitors Marietta Bowen and Michael Jordan and to Diane Wigle, chief of the Safety Countermeasures Division.

All statements, judgments, errors, and omissions are solely the responsibility of the author and do not necessarily reflect the views of the Advisory Panel, the panelists' organizations, or NHTSA.

User comments and suggestions

If this guide is useful, NHTSA will consider revising, updating, and expanding it periodically. Readers and users are invited to provide their suggestions and recommendations, especially additional examples of promising practices. Please send your suggestions and recommendations to:

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Abbreviations and terminology

Operator or motorcycle operator: person in control of a motorcycle

Passenger: a person riding on but not operating a motorcycle

Motorcyclist or rider: either an operator or a passenger

BAC	blood alcohol concentration
BRC	MSF's Basic <i>RiderCourse</i>
DMV	Department of Motor Vehicles of a State
DOT	Department of Transportation of a State
DUI	driving under the influence of alcohol or other drugs
ERC	MSF's Experienced <i>RiderCourse</i> Suite
FARS	Fatality Analysis Reporting System, operated by NHTSA
FMVSS	Federal Motor Vehicle Safety Standard
GES	General Estimates System, operated by NHTSA
HOV	High-Occupancy Vehicle, referring to roadway lanes
NAMS	National Agenda for Motorcycle Safety
NCHRP	National Cooperative Highway Research Program
RSS	MSF's <i>Riding and Street Skills</i> basic training course, now replaced with BRC

Organizations and Web sites

AAMVA	American Association of Motor Vehicle Administrators (www.aamva.org)
AASHTO	American Association of State Highway and Transportation Officials (www.transportation.org)
ABATE	State rider organizations, which use different specific names in different States
AMA	American Motorcyclist Association (www.ama-cycle.org)
CALEA	Commission for Accreditation for Law Enforcement Agencies (www.calea.org)
GHSA	Governors Highway Safety Association (www.statehighwaysafety.org)
GWRRRA	Gold Wing Road Riders Association (www.gwrra.org)
H.O.G.	Harley Owners Group (www.harley-davidson.com/wcm/Content/Pages/HOG/hog_selector.jsp?locale=en_US)
IACP	International Association of Chiefs of Police (www.iacp.org)
MADD	Mothers Against Drunk Driving (www.madd.org)
MRF	Motorcycle Riders Foundation (www.mrf.org)
MSF	Motorcycle Safety Foundation (www.msf-usa.org)
NHTSA	National Highway Traffic Safety Administration (www.nhtsa.dot.gov)
NSA	National Sheriff's Association (www.sheriffs.org)
RADD	Recording Artists, Actors & Athletes Against Drunk Driving (www.radd.org)
RID	Reduce Impaired Driving (www.rid-usa.org)
SADD	Students Against Destructive Decisions (www.sadd.org)
SMSA	National Association of State Motorcycle Safety Administrators (www.smsa.org)

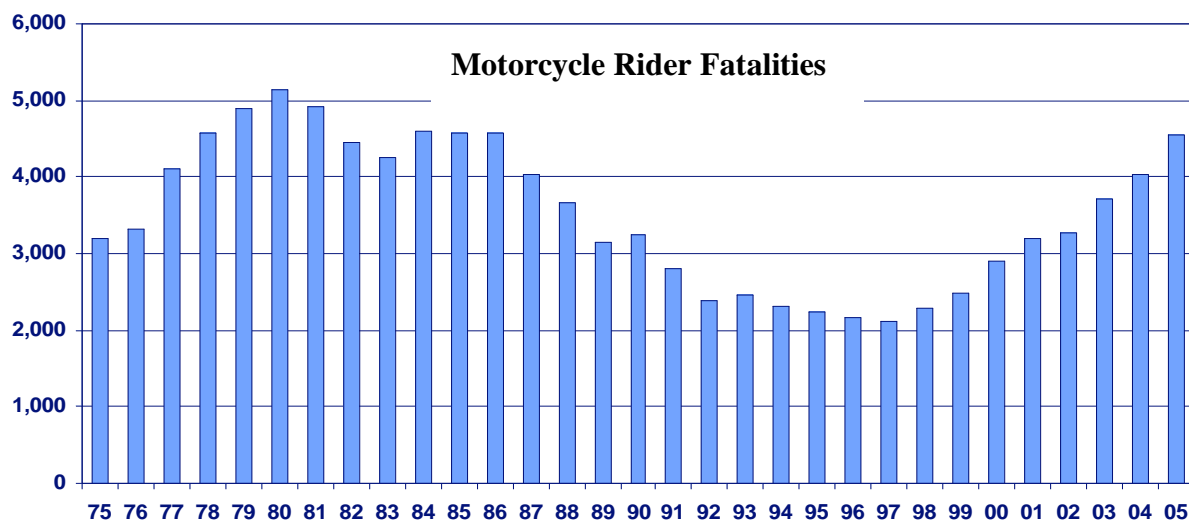
Overview of motorcycle crash issues

Motorcycle riders face more risks of crashing and being injured than passengers in four-wheeled vehicles. Two-wheeled motorcycles are more difficult to operate and more unstable than four-wheeled cars and trucks. Some roadway design and maintenance features add additional risks. Other vehicle drivers may not expect to see motorcycles on the road, may not watch for them, and may not know how to accommodate them in traffic. And when they crash, motorcycles provide almost no protection to their riders.

Crash data confirms these risks. NHTSA estimates that 80 percent of motorcycle crashes injure or kill a motorcycle rider, while only 20 percent of passenger car crashes injure or kill an occupant. For each mile of travel in 2004, motorcycle riders were eight times more likely to be injured in a crash, and 34 times more likely to die, than passenger car occupants. Motorcycle riders now account for about 10 percent of all traffic fatalities nationwide.

Trends

As NAMS was being developed in 1998 and 1999, motorcycle rider fatalities had begun increasing slightly from an all-time low of 2,116 in 1997. Since then, they have risen rapidly: up 115 percent to 4,553 in 2005, the last year with complete data. See NHTSA (2005a, 2006a, and 2006b) for data.



To get a complete picture, these fatality increases should be compared to motorcycle travel changes. Unfortunately, vehicle miles of travel (VMT) data for motorcycles are not reported directly and must be estimated. These estimates show no change in motorcycle travel from 1997 to 2004. To the extent that the estimates are consistent across the years, they suggest that each mile of motorcycle travel in 2004 was almost twice as likely to kill a motorcycle rider as it was in 1997.

Motorcycle registrations are known quite accurately. From 1997 to 2004 registrations increased 51 percent, slightly more than half as fast as rider fatalities. So rider fatalities per registered motorcycle increased 26 percent during this time. If the travel estimates are accurate, the increase in registrations means that average travel per motorcycle decreased.

Motorcycle trends	1997	2004	increase
Motorcycle rider fatalities	2,116	4,028	+ 90.4 %
Registrations (thousands)	3,826	5,781	+ 51.0 %
Miles of travel (thousands)	10,081	10,048	- 0.3 %

A final important trend is that motorcyclists are getting older. In 2005, 36 percent of the motorcycle operators in fatal crashes were age 45 or older, compared to 22 percent in 1997.

Conclusions: In 2004, compared to 1997, there were:

- more motorcycles on the road,
- operated by older motorcyclists,
- riding fewer average miles per year, and
- with higher rider fatality rates both per motorcycle and per mile.

Key problem areas

Three key problem areas stand out in the data. In 2005, in all fatal crashes involving motorcycles:

- 24 percent of the motorcycle operators involved were not properly licensed,
- 34 percent of the fatally injured motorcycle operators had been drinking (with a positive BAC), and
- 42 percent of those who were killed were not wearing a helmet.

The first four sections of this guide address these problem areas: Section 1 on alcohol and other drugs, Section 2 on motorcycle helmets and other personal protective equipment, and Sections 3 and 4 on the related areas of operator training, education, and licensing. Section 5 then addresses other motorists, followed by Section 6 on highway and environmental issues. The guide concludes with Section 7 on management.

General references for the overview and subsequent sections

NAMS:

- NHTSA (2000). *National Agenda for Motorcycle Safety*. DOT HS 809 156. Washington, DC: National Highway Traffic Safety Administration.
www.nhtsa.dot.gov/people/injury/pedbimot/motorcycle/00-NHT-212-motorcycle/index.html. This is NAMS, developed by a Technical Working Group, led by NHTSA and MSF; also available at www.msf-usa.org.
- MSF, in cooperation with NHTSA, launched the NAMS Web site and it can be found at www.implementNAMS.org.

Data:

- NHTSA (2005a). *Traffic Safety Facts 2004*. DOT HS 809 919. Washington, DC: National Highway Traffic Safety Administration. www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/TSFAnn/TSF2004.pdf. The annual report of traffic crash, injury, and fatality data from NHTSA's FARS and GES systems; source of data in this overview. Usually released in August of the following year.
- NHTSA (2006a). *Motor Vehicle Traffic Crash Fatality Counts and Estimates of People Injured for 2005*. DOT HS 810 639. Washington, DC: National Highway Traffic Safety Administration. www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/PPT/2006/810639.pdf.
- NHTSA (2006b). *Traffic Safety Facts 2005: Motorcycles*. DOT HS 810 620. Washington, DC: National Highway Traffic Safety Administration. www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/TSF2005/MotorcyclesTSF05.pdf. A 6-page summary of key motorcycle crash data from *Traffic Safety Facts 2005*. Issued annually.
- Shanker, U., and Varghese, C. (2006). *Recent Trends in Fatal Motorcycle Crashes: An Update*. DOT HS 810 606. Washington, DC: National Highway Traffic Safety Administration. www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/Rpts/2006/810606.pdf. Data from 1995 through 2004 together with projections for 2005.

Overviews and summaries

- NHTSA (2006b). *2006 Motorcycle Safety Program Plan*. Washington, DC: National Highway Traffic Safety Administration. DOT HS 810 615. www.nhtsa.dot.gov/people/injury/pedbimot/motorcycle/MotorcycleSafety.pdf. An overview of motorcycle safety as of 2006 and a summary of recent, current, and proposed NHTSA motorcycle safety initiatives.
- NHTSA's Motorcycle Safety Program Guideline outlines a comprehensive State program. The guideline and other NHTSA motorcycle program resources are available at www.nhtsa.dot.gov/people/injury/pedbimot/motorcycle/general.htm. NHTSA plans to update this guideline in 2006.
- NCHRP (under review). *Guide for Addressing Collisions Involving Motorcycles*. This guide for States, produced through the National Cooperative Highway Research Program to support the American Association of State Highway Safety and Transportation Officials Strategic Highway Safety Plan, includes discussions and strategies for roadway and environmental issues, rider impairment, operator training and licensing, motorcyclist conspicuity, personal protective equipment, rider and motorist awareness, and research. It contains extensive references. When released, the guide will be available at www.ch2m.com/nchrp/over/default.htm.
- Hedlund, J.H. (2006). *Countermeasures That Work: A Highway Safety Countermeasure Guide for State Highway Safety Offices*, DOT HS 809 980, www.nhtsa.dot.gov/people/injury/airbags/Countermeasures/. Chapter 5 covers motorcycle safety and discusses operator training and licensing, helmets, alcohol impairment, and communications and outreach. It contains extensive references.

Section 1. Alcohol and other drugs

Overview

In 2000, NAMS listed reducing motorcycle operator alcohol and drug involvement as one of its four top-priority “urgent” recommendations. The urgency is even greater today. In 2000, 1,188 motorcycle operators in fatal crashes had a positive blood alcohol concentration (BAC). In five years the number rose 34 percent, to 1,587 in 2005. Similarly, the number of operators in fatal crashes with a BAC over the legal limit of .08 grams per deciliter rose 32 percent, from 944 in 2000 to 1,246 in 2005. The only good news is that the proportion of alcohol-involved motorcycle operators in fatal crashes dropped: 34 percent had a positive BAC in 2005 compared to 40 percent in 2000, and 27 percent were over .08 g/dL in 2005 compared to 32 percent in 2000. But this drop in alcohol-involvement percentages results from the even more rapid increase in the number of sober motorcycle operators in fatal crashes from 2000 to 2004. See NHTSA (2005a) and Pickrell (2006) for data.

Motorcycle operators in fatal crashes have higher alcohol involvement rates than other drivers. The 2005 rate of 34 percent with a positive BAC compares with 26 percent for passenger car drivers; the 27 percent of motorcycle operators over .08 compares with 22 percent for passenger cars. Light-truck driver alcohol rates were slightly lower than passenger car driver rates (NHTSA, Traffic Safety Facts 2005).

Operating a motorcycle while impaired by alcohol or other drugs differs from impaired driving in several important respects. A two-wheeled motorcycle is inherently more difficult to control than a four-wheeled car or light truck, so that motorcycle operators have less margin for error than other vehicle drivers. Impaired driving laws apply to motorcycle operators and other vehicle drivers equally, but many DUI enforcement and publicity activities are directed primarily to four-wheeled vehicle drivers. Finally, some motorcyclists and motorcycle groups have been associated with a culture that combined alcohol and motorcycling.

These differences present opportunities that form the basis of the four complementary strategies in this section. *Communications* can use messages and delivery methods that focus on motorcycle operators to be more efficient and effective than general communications directed to all drivers. If designed, conducted, and publicized appropriately, *DUI enforcement* can reach and affect many motorcycle operators efficiently. States and communities may wish to *cooperate* with groups already engaged in impaired driving activities to increase their focus on motorcyclists. Finally, some *rider groups* are establishing a positive alcohol- and drug-free riding culture.

These four strategies interlock. Rider groups and impaired driving groups can play a key role in developing and delivering communications to riders and in crafting effective enforcement activities. Enforcement needs good communications to be effective.

Objective: Reduce crashes in which motorcycle operators are impaired by alcohol or other drugs.

Strategy 1.1: Communications – Create and disseminate effective communications to riders on how alcohol and other drugs affect motorcycle operator skills.

The scientific facts of how alcohol affects motorcycle operators' judgment, motorcycling skills, and crash risk are generally well-established (See Jones and Lacey [2001] for a comprehensive survey of alcohol and traffic safety). NHTSA is conducting additional research on the effects of lower BAC levels on motorcycle operators. Knowledge is more limited regarding other drugs. Not all motorcycle operators know or understand how alcohol and other drugs affect riding skills. Effective communications must be based on sound science, must be presented in ways that attract attention, must be believable and memorable, and must use media and delivery methods that reach motorcyclists. The action steps below suggest methods to do this.

Action steps:

- State motorcycle safety administrators, State highway safety offices, State insurance commissioners, and rider groups create messages and material that motorcyclists will understand and believe.
- State highway offices and rider group leadership develop strategies and campaigns for alcohol and drug awareness and positive advocacy from within individual rider groups and organizations.
- Distribute communications through rider groups, rider media, dealers, local news, law enforcement media, and insurance companies.
- Law enforcement motorcycle officers deliver impaired riding messages to motorcyclists.
- State motorcycle safety administrators, State highway safety offices, rider groups, and others work with motorcycle-friendly businesses that serve alcohol to create awareness of server training issues and encourage safe-ride-home options.

Promising practices:

- Many States, including California, Connecticut, Indiana, Minnesota, Missouri, Ohio, Oregon, and Wisconsin, have conducted impaired motorcycling campaigns and have impaired motorcycling material. For information, contact the respective Highway Safety Offices. Example Web links:
 - Connecticut: www.ride4ever.org/safe/rideSober.php
 - Missouri: www.mmsp.org/alcohol.htm
 - Minnesota: www.dps.state.mn.us/mmsc/latest/MMSCHome.asp?cid=1;
[www.dps.state.mn.us/mmsc/latest/MMSCHomeSecondary.asp?cid=4&mid=196](http://www.dps.state.mn.us/mmsc/latest/MMSCHomeSecondary.asp?cid=4&mid=196&scat=67)
[&scat=67](#) for campaign material
 - Wisconsin: www.dot.wisconsin.gov/business/publications/safetymaterials.htm
- In 2005 the California Motorcycle Safety Program distributed 11,000 posters to all public high schools, community colleges, State colleges, universities, DMV offices, franchised motorcycle dealerships, and California Highway Patrol field offices. Three different alcohol awareness posters emphasized the need to avoid drinking and riding.
- Georgia's 2006 "Riders Helping Riders" campaign delivers the impaired riding message to motorcyclists from a source they trust the most – other riders. The Georgia Department of Driver Services will use Riders Helping Riders in all its motorcycle safety training programs. Georgia motorcycle safety instructors will make presentations at club meetings, rallies, dealer events and other rider gatherings, focusing on how to keep riders

away from alcohol when they're riding, keeping alcohol away from rider gatherings, and teaching ways to discourage fellow riders from riding when they've been drinking. The program also seeks to educate riders who might feel that drinking and riding is not as dangerous as it actually is. The program is funded by NHTSA and Georgia is serving as the pilot test State. For information, contact the Director of Public Affairs, Governor's Office of Highway Safety, 404-657-9105, jshuler@gohs.state.ga.us

- Ohio is conducting focus groups in 2006 to develop an impaired motorcycling communications and enforcement campaign (Ride Smart/Sober). For information, contact Motorcycle Ohio at 800-837-4337.
- The Oregon highway office hosted an Impaired Rider Symposium in 2005, in collaboration with motorcycle safety and rider group leaders and law enforcement officials. For information, contact Team Oregon at team.oregon@oregonstate.edu.
- Minnesota Motorcycle Dial-a-Ride (www.motorcycledialaride.org) is a nonprofit 501(c)3 volunteer organization established in 1990 to educate Minnesota motorcyclists about the consequences of drinking and riding, to encourage the use of intervention methods to prevent impaired riders from riding, and to provide a safe free ride service to motorcyclists in Minnesota as a final intervention method. Motorcycle Dial-A-Ride provides a free ride home from 6 pm Friday through midnight Sunday from the last weekend of April through the last weekend of October, as well as on Memorial Day, Fourth of July, and Labor Day. When motorcyclists call the toll free number, 888-DIALRID(E) or 888-342-5743 during the hours of service, Motorcycle Dial-A-Ride will dispatch a volunteer equipped to transport the operator, passenger, and their motorcycle from a public establishment to the rider's home or local accommodation. Motorcycle Dial-A-Ride, Inc., is supported by ABATE of Minnesota, motorcycle organizations, businesses, and over 200 volunteers statewide.

Resources and supporting activities:

- SMSA's Resource Idea Sampler (www.smsa.org/motorcycle_awareness/idea_sampler/print_materials/resources/index.php) lists posters and brochures from Indiana, Minnesota, Ohio, Oregon, and Wisconsin.
- AMA and NHTSA's Ride Straight campaign (www.ridestraight.org) provides downloadable audio, video, and print material as well as information on the effects of alcohol on the body and links to alcohol-impairment research and crash statistics.
- MSF (www.msf-usa.org) provides "Don't Drink and Ride" PSAs produced by RADD as well as general information about the effects of alcohol and other drugs on motorcyclists.
- MSF makes its Riding Straight Module available for purchase. Riding Straight is a complete alcohol-awareness program that can be used by motorcyclists, motorcycle groups, and other individuals and groups who would like to contribute to motorcycle safety by facilitating interactive events about the folly of drinking and riding. The Riding Straight Module contains a Facilitator's Guide, a 12-minute Riding Straight VHS Video, Fatal Vision Simulator Goggles, a roll of MSF floor tape, and a CD with a digital copy of the Facilitator's Guide.

- NHTSA is conducting a study on educational, public information, and other activities to reduce impaired motorcycling. The results, authorized by SAFETEA-LU, will be presented in a report to Congress.
- NHTSA is conducting a closed-course study to examine the impairing effects of alcohol at different BAC levels on motorcycle skills.
- NHTSA is developing, testing, and evaluating a multifaceted program to reduce alcohol-related motorcycle crashes. The program includes communications and outreach activities, enforcement of existing traffic laws, and cooperative activities with tavern owners and motorcycle dealers.

Strategy 1.2: Enforcement – Include motorcyclists in effective and well-publicized impaired driving enforcement activities.

It is illegal to operate a motorcycle or any other motor vehicle on a public highway when impaired by alcohol or other drugs. All States and the District of Columbia have enacted *per se* laws under which it is illegal to operate a motor vehicle with a BAC of .08 or higher, with no other evidence of impairment required. All States enforce their impaired driving laws during regular patrol operations and special campaigns. Highly visible and well-publicized DUI enforcement convinces many drivers not to drive after drinking.

Effective motorcycle DUI enforcement requires that law enforcement officers be trained to identify a motorcyclist in traffic who may be impaired and that DUI enforcement operations be conducted in areas where motorcyclists frequently ride or crash. It also requires publicity directed to motorcyclists that communicates the potential consequences of a DUI arrest in terms that may influence motorcyclists' behavior.

Action steps:

- Integrate motorcycles into the Impaired Driving Crackdown and other impaired driving enforcement activities; include motorcycle operators and rider groups in planning and coordinating impaired driving enforcement and publicity activities.
- Develop and disseminate an appropriate amount of motorcyclist-relevant publicity within overall impaired driving publicity.
- Educate patrol officers on the behavioral cues of alcohol-impaired motorcyclists; include these cues in regular Standardized Field Sobriety Test (SFST) training for all law enforcement officers.
- Provide information to law enforcement through presentations or booths at national and State conferences and meetings of law enforcement organizations such as the International Association of Chiefs of Police (IACP), the National Sheriffs Association (NSA), and the Commission for Accreditation for Law Enforcement Agencies (CALEA).
- Establish a highly visible law enforcement presence at rider events.
- State Highway Safety Office law enforcement liaisons meet with law enforcement agencies in motorcycle crash "hot spots" to encourage an emphasis on officer education and motorcycle enforcement planning.

Promising practices:

- Some States distribute NHTSA's Detection of DWI Motorcyclists brochures and cue cards directly to law enforcement agencies. Examples include Illinois (ruffls@dot.il.gov) and West Virginia (304-558-1041 or jtyree@dot.state.wv.us).
- California's Motorcycle Safety Program (CMSP) has joined with various law enforcement agencies and rider groups at public events to promote rider safety and education. At these events the Fatal Vision Impairment Simulator Goggles are always featured and event participants are encouraged to experience the goggle exercise. From January 2004 to April 2006 the CMSP had participated in events attended by over 180,000 current and prospective motorcyclists.
- Pennsylvania's Motorcycle Safety Program, through its extensive network of instructors, participates in public events across the State. The Fatal Vision Goggles are used as a popular interactive way to increase awareness of the effects of alcohol consumption and riding ability.
- Minnesota has incorporated the NHTSA [Detection of DWI Motorcyclists](#) brochures and cue card information into a Web-based seminar presentation. The seminar is eligible for two hours POST credit for agencies that wish to have the presentation given to their staff in-house. For information, contact the Information Officer at the Minnesota Motorcycle Safety Center at 651-282-2916 or Pat.hahn@state.mn.us.
- For the past two years, Wisconsin has employed State patrol motor officers and county and local law enforcement at major rider events to educate riders on motorcycle safety and to enforce all traffic laws, including impaired riding. This strategy has been used at the 2004 H.O.G. Rally in Chippewa Falls, the 2005 H.O.G. Rally in Manitowoc, and the 2004 and 2005 Fall Color Rides at Tomahawk. For information, contact the Wisconsin Motorcycle Safety Program at 608-266-7855 or ron.thompson@dot.state.wi.us.
- Several other States regularly establish a high-visibility law enforcement presence at major rider events. For information on Ohio's program, contact the Ohio State Highway Patrol at 614-466-3167, or Motorcycle Ohio at 800-837-4337.

Resources and supporting activities:

- A brochure and cue card on identifying motorcycle operators impaired by alcohol are available from NHTSA: The Detection of DWI Motorcyclists, DOT HS 807 856, 2005, www.nhtsa.dot.gov/people/injury/pedbimot/motorcycle/610DWIMotorcyWeb/pages/
- NHTSA includes impaired motorcycle riding in its high-visibility enforcement impaired driving campaign each year.

Strategy 1.3: Partnerships – Encourage partnerships with groups already involved in impaired driving activities, such as MADD and SADD.

Many national, State, and community organizations have conducted extensive activities to reduce impaired driving. Some, such as MADD, RADD, RID, and SADD, have the reduction of impaired driving as their primary mission. Others, such as many local Safe Community organizations, include impaired driving within a broader highway safety mission. These organizations often do not include motorcyclists within their membership and have few program activities directed toward or relevant to motorcyclists. Similarly, many impaired motorcycling

activities have not approached these organizations to investigate cooperative activities. These and similar organizations may be able to lend their expertise and resources to assist impaired motorcycling activities.

Action steps:

- State motorcycle safety administrators and State highway safety offices collaborate to bring together rider groups, law enforcement, and impaired driving groups, to seek common ground and investigate cooperative activities.

Promising practices:

- Wisconsin's 2004 motorcycle safety summit included representatives from Safe Community organizations.
- Oregon's State motorcycle safety program partners with "biker bars" to conduct training clinics and drinking and riding awareness activities. For information, contact Team Oregon at team.oregon@oregonstate.edu.
- The Pennsylvania DUI Association has created a special division to increase motorcyclists' awareness of the dangers of riding while under the influence. The DUI Association reaches thousands of motorcyclists annually at major motorcycling events including the Harley-Davidson York Open House, Gettysburg Bike Week, Carlisle Summer Bike Fest, and Thunder in the Valley. The association also joins with Pennsylvania's DOT, law enforcement, Motorcycle Safety Program, and other organizations in *Team DUI*, a collaboration to fight drunk driving. For further information contact the Pennsylvania DUI Association at 717-238-4354.
- In Pennsylvania, Laugerman's Harley-Davidson dealership, a leader in alcohol-free events, has worked closely with Pennsylvania's Motorcycle Safety Program to communicate alcohol and drug awareness.

Resources and supporting activities:

- No specific resources for this strategy. For general resources see Strategy 7.3, cooperative activities.

Strategy 1.4: Rider groups – Encourage rider groups to conduct alcohol- and drug-free events.

Rider groups, both formal and informal, have substantial influence in the motorcycling community. National rider organizations have consistently advocated and acted to improve rider safety by discouraging motorcycling while impaired by alcohol or other drugs: see for example the AMA and NHTSA Ride Straight campaign (Strategy 1.1). But a portion of the motorcycle culture has been closely associated with alcohol, for example through bars with a predominantly motorcyclist clientele or organized rides that proceed from bar to bar. Some State and local rider groups have acted to change this culture by sponsoring alcohol-free events or by adopting an alcohol-free policy.

Action steps:

- Rider group State organizations endorse alcohol- and drug-free events.
- Local rider groups adopt and abide by alcohol- and drug-free event policies.
- Rider groups establish relationships with businesses other than bars for organized rides.

Promising practices:

- The Fox Valley, Wisconsin, Harley Owners Group (H.O.G.) chapter established a Group Riding Protocol by majority vote on July 5, 2005: “All Fox Valley, Wisconsin, H.O.G. Chapter rides are drug- and alcohol-free. Any amount of alcohol negatively affects a rider’s ability to operate a motorcycle; therefore, Harley-Davidson of Appleton, H.O.G., and the Fox Valley, Wisconsin, H.O.G. Chapter strictly prohibit the consumption of alcoholic beverages prior to or during breaks on scheduled rides.” For information, contact the Fox Valley H.O.G. Chapter at 920-757-1651.
- The Gold Wing Road Riders Association (GWRRA) policy prohibits the sale, distribution, or advertising of alcoholic beverages at any GWRRA event (www.gwrro.org/officers/officerguidebook.html, Section G, page G-3).
- Illinois ABATE sponsors alcohol-free rides. For information, contact abate@galesburg.net.
- As a result of Oregon’s 2005 Impaired Rider Symposium, individual rider groups developed zero-alcohol policies for their rides. For information, contact Team Oregon at team.oregon@oregonstate.edu.
- ABATE of Pennsylvania, in cooperation with the Pennsylvania DOT, sponsors a poster contest to increase alcohol awareness.

Resources and supporting activities:

- See resources and supporting activities listed under Strategy 1.1.

References and notes for Section 1, Alcohol and other drugs

NAMS recommendations for States and communities on alcohol and other drugs:

28. Continue to discourage mixing alcohol and other drugs with motorcycling.
29. Educate law enforcement about unique alcohol-related behavior of motorcyclists.
30. Encourage partnerships with groups already involved in alcohol/substance abuse issues related to motor vehicle crashes, e.g., MADD and SADD.

General references on alcohol, other drugs, and motorcycling

- Becker, L.R., McKnight, A.S., and Nelkin, V.S., et al. (2003). *Drinking, Riding, and Prevention: A Focus Group Study*. DOT HS 809 490. Washington, DC: National Highway Traffic Safety Administration.
www.nhtsa.dot.gov/people/injury/pedbimot/motorcycle/DrinkRidePrevent/index.htm#TABLE%20OF%20CONTENTS. The most recent study exploring the motivations and activities of motorcyclists who drink and ride, and methods that may reduce their drinking and riding.
- Jones, R.K., and Lacey, J.H. (2001). *Alcohol and Highway Safety 2001: A Review of the State of Knowledge*. DOT HS 809 383. Washington, DC: National Highway Traffic

Safety Administration. www.nhtsa.dot.gov/people/injury/research/AlcoholHighway/. A comprehensive summary as of 2001, with extensive references.

- NHTSA (2005a). *Traffic Safety Facts 2004*. DOT HS 809 919. Washington, DC: National Highway Traffic Safety Administration. www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/TSFAnn/TSF2004.pdf. Complete data on fatal and nonfatal crashes from NHTSA's FARS and GES systems. Issued annually.
- Pickrell, T.M. (2006). Driver alcohol involvement in fatal crashes by age group and vehicle type. *Traffic Safety Facts: Research Note*. DOT HS 810 598. Washington, DC: National Highway Traffic Safety Administration. www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/RNotes/2006/810598.pdf. A 6-page summary of key FARS data from 2000 to 2004.

Section 2. Personal protective equipment

Overview

Even the best-trained and most safety-conscious motorcyclists may be involved in a crash. If they are, motorcycle helmets and other personal protective equipment provide their only defense against injury. Helmets meeting the FMVSS 218 standard are highly effective in reducing head and brain injuries (see Liu et al. [2003] for a comprehensive review of the evidence). Helmets with face shields also protect riders' eyes from wind and foreign objects. Well-constructed jackets, pants, boots, and gloves can prevent abrasions and bruises. If made of impact-resistant material, they may prevent arm and leg fractures or serious torso and spinal cord injuries.

As of 2006, 20 States require all motorcyclists to wear helmets and most other States require motorcyclists under the age of 18 or 21 to wear helmets. Thirty-six States require some form of eye protection. While helmets have received the most attention and produced the most controversy, protective equipment may be most effectively considered and marketed as a total package.

Helmets are the only personal protective equipment item regulated by the Federal government and for which use data are available. Forty-eight percent of all riders observed in NHTSA's 2005 nationwide survey wore FMVSS 218-compliant helmets, down from 71 percent in 2000. An additional 9 percent wore non-compliant helmets. FMVSS 218 helmet use was 67 percent in States with helmet use laws covering all riders compared to 38 percent in other States (Glassbrenner, 2005).

Objective: Increase the number of motorcyclists who wear FMVSS 218-compliant helmets and other personal protective equipment.

Strategy 2.1: Education – Educate motorcyclists about the benefits of FMVSS 218-compliant helmets and other protective equipment.

The benefits of personal protective equipment are well-established through solid and unbiased research. This information should be communicated to motorcyclists in an unbiased way, through channels that motorcyclists will understand and trust.

Action steps:

- Coordinate efforts among State motorcycle safety administrators, highway safety offices, rider groups, and others to develop campaigns and messages that motorcyclists will understand and believe.
- Distribute communications through rider groups, law enforcement officers, rider media, dealers, local news, and other means.
- Encourage States with helmet laws covering all motorcyclists to erect signs at State borders reminding motorcyclists to wear helmets.

Promising practices:

- In 2004, Minnesota conducted a Motorcycle Helmet Challenge that loaned new helmets to nonwearers for three weeks. The Challenge is described at <http://www.dps.state.mn.us/mmhc/latest/MMSCHomeSecondary.asp?cid=4&mid=197&scat=68>.
- In several States, motorcycle safety program staff and trainers provide a consistent example by always wearing appropriate protective equipment when riding and by promoting the value of this equipment. Examples include California, New Mexico (contact the New Mexico Motorcycle Safety Program at davidfsmith4@comcast.net), Oregon (contact Team Oregon at team.oregon@oregonstate.edu), and Pennsylvania.
- California's posters (see Section 1.1) also promoted proper personal protective gear.

Resources and supporting activities:

- Campaign material from Minnesota and Wisconsin is available from SMSA (www.smsa.org/motorcycle_awareness/promotional_materials/). See also the Minnesota Web site (www.dps.state.mn.us/mmhc/latest/MMSCHome.asp?cid=1).
- MSF has brochures, posters, and other material on protective equipment (www.msf-usa.org/index_new.cfm?spl=2&action=display&pagename=Library).
- NHTSA is developing a public service announcement to promote helmet use and is updating its motorcycle helmet use support material.

Strategy 2.2: Promotion – Promote protective equipment through rider groups, motorcycle organizations, dealers, and motorcycle manufacturers.

Some motorcyclists may be discouraged from using protective equipment by peer pressure. Rider groups that endorse individual freedoms can respect and support riders who choose to wear proper gear. Manufacturers can incorporate proper gear into their total brand package.

Action steps:

- Rider groups endorse proper protective gear and encourage members to wear proper gear.
- Motorcycle manufacturers and dealers promote the use of proper protective gear.

Promising practices:

- Dealers promote proper gear when selling a motorcycle.
- Manufacturers promote protective equipment through product advertising.

Resources and supporting activities:

- MSF provides the information documents “Personal Protective Gear” and “How Helmets Work” at www.msf-usa.org.
- GWRRA encourages the use of personal protective gear, including helmets (www.gwrri.org/officers/, MADPlaybook, Sec. VI-c).
- AMA “has always encouraged the use of helmets, gloves, sturdy footwear, and protective garments in general, as part of a comprehensive motorcycle safety program to help reduce injuries and fatalities in the event of a motorcycle accident” (www.amadirectlink.com/legisltn/positions/helmet.asp).

- NHTSA will implement an outreach program directed at motorcycle helmet manufacturers through which it will attend trade show events to conduct field inspections of helmets and provide information about FMVSS 218 requirements and procedures.

Strategy 2.3: Noncompliant helmets – Increase the use of FMVSS 218-compliant helmets through education and promotion.

Some motorcycle helmets do not meet the performance standards of FMVSS 218. In NHTSA's 2005 national survey, almost one-sixth of the helmets observed on the road were noncompliant helmets. These noncompliant helmets provide little or no protection. Motorcyclists should know the facts about noncompliant helmets and be able to determine if a helmet is noncompliant. Many State helmet laws require helmets to comply with FMVSS 218.

Action steps:

- Communicate to motorcyclists the benefits of FMVSS 218-compliant helmets and how they can be identified.
- Educate law enforcement on how to identify noncompliant helmets and encourage them to cite noncompliant helmet wearers in States requiring FMVSS 218-compliant helmets.

Promising practices:

- Some dealers have conducted a "beanie buy-back" program where riders who turn in a noncompliant helmet receive a discount on a FMVSS 218-compliant helmet.
- Many State motorcycle safety programs have cross-section examples of compliant and noncompliant helmets on display at training sites.
- In 2005, West Virginia added noncompliant helmet information to the annual State Police in-service training. Officers learned how to identify noncompliant helmets through discussion, printed material, and examples of noncompliant and FMVSS 218-compliant helmets.

Resources and supporting activities:

- The Washington State Patrol provides a brochure on how to identify noncompliant helmets and the safety benefits of compliant helmets (www.wsp.wa.gov/traveler/helmets.htm).
- NHTSA provides a brochure for the public on identifying noncompliant helmets (www.nhtsa.dot.gov/people/injury/pedbimot/motorcycle/UnsafeHelmetID/images/UnsafeHelmets.pdf) and a brochure and video for law enforcement (www.nhtsa.dot.gov/people/outreach/safesobr/21qp/html/program_pubs/moto_safety.htm).
- NHTSA is considering amending FMVSS 218 to make it easier to confirm that a helmet complies with the standard.
- NHTSA is developing a video that will be viewable on its Web site in Spring 2007 to assist consumers on how to determine whether a motorcycle helmet fits them properly and how to identify whether their motorcycle helmet is compliant with FMVSS 218.

References and notes for Section 2, Personal protective equipment

NAMS recommendations for States and communities on personal protective equipment

31. Use effective strategies to increase the use of FMVSS 218-compliant helmets.
32. Educate motorcyclists about the value of protective apparel by providing an information source on related research and a forum for the exchange of information.
33. Find ways to more effectively communicate the benefits of helmet use and work toward making voluntary use of FMVSS 218-compliant helmets more widely accepted.
34. Use effective strategies to ensure that all helmets in use meet FMVSS 218.

General references on personal protective equipment

- Glassbrenner, D. (2005). *Motorcycle Helmet Use in 2005 - Overall Results*. DOT HS 809 937. Washington, DC: National Highway Traffic Safety Administration, [www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/RNotes/2005/809-937/809937.html](http://www.nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/RNotes/2005/809-937/809937.html). Helmet use data from NHTSA's nationwide observational survey.
- Liu, B., Ivers, R., Norton, R., et al. (2003). Helmets for preventing injury in motorcycle riders. *The Cochrane Database of Systematic Reviews*. www.cochrane.org/reviews/en/ab004333.html. The definitive synthesis of helmet effectiveness research.

Section 3. Motorcycle operator training and education

Overview

NAMS describes motorcycle operator training and education as “the centerpiece of a comprehensive motorcycle safety program.” Operator training and education enjoy broad support from the motorcycle industry, motorcycle rider organizations, and motorcyclists.

Training is provided in formal courses for both novice and experienced motorcyclists. In training, operators first learn the information and physical skills needed to operate a motorcycle safely and then practice safe riding skills and decision-making under careful supervision. Education reinforces and supplements the information provided in training courses. Education reaches motorcyclists through a wide variety of communication methods.

In 2006, 47 States had State-operated and legislated training and education programs and the other three had privately operated programs. Training also is provided by some rider organizations (for example, ABATE operates basic operator training in Alaska and Arkansas and some Gold Wing groups provide training), manufacturers (such as Harley-Davidson’s Riders Edge and American Honda training sites operated by Honda in California, Georgia, Ohio, and Texas), and private providers. Most training uses one of the curricula developed by MSF: BRC (Basic *RiderCourse*, introduced in 2001 to replace the RSS – *Riding and Street Skills* – course), and the ERC Suite (Experienced *RiderCourse Suite*). Oregon developed its own basic rider course and also offers its own intermediate and advanced rider courses.

MSF also offers additional courses for more specialized audiences. Hands-on courses include Scooter School and DirtBike School (used by some as a precursor to BRC). Classroom-only courses include Riding Straight (to discourage riding while impaired), Seasoned Rider (to assist older riders in compensating for the effects of aging), and Guide to Group Riding (to foster safe riding practices among those who ride in groups).

Many States encourage training either by requiring it for all motorcycle operators under a specified age or by waiving some license test requirements for motorcycle operators who complete an approved training course. Effective in July 2008, Florida will require training for all first-time applicants for a motorcycle operators license, regardless of age (Florida SB 1742, §322.12). Baer, Cook, and Baldi (2005) summarize motorcycle operator education and licensing practices across 38 States and list each State’s practices as of 2001, including training providers, curricula, costs, incentives, enrollment, instructors, and links to licensing. MSF provides a table of State licensing requirements and waivers (www.msf-usa.org, State Laws and Reports) and a summary chart of State motorcycle rider education programs (www.msf-usa.org, Library, Cycle Safety Information Documents).

Many States have Web sites listing State-approved training courses and schedules. MSF has a national directory of MSF course locations and contact information (www.msf-usa.org).

The overall goal is to ensure that every motorcycle operator is properly trained. Specific goals are to:

- Convince all novice motorcycle operators to be trained;
- Provide convenient, timely, and affordable training;
- Provide and promote training for intermediate and experienced operators, especially those who have not ridden regularly for some years, so that they can refresh their motorcycling skills and keep them current; and
- Ensure that training is uniformly and consistently high-quality.

To support operator training, NHTSA, MSF, and SMSA are working cooperatively on several initiatives to evaluate and improve operator training and to expand training capacity. These initiatives are discussed in the resources and supporting activities sections of the individual strategies.

Objective: Provide motorcycle operator training to all who need or seek it; increase motorcyclists' knowledge of methods to increase their safety on the road, including awareness of hazards, motorcycle operating techniques, and conspicuity.

Strategy 3.1: Training availability – Expand or reorganize State operator training if needed so that capacity is available to meet demand in a timely manner.

Training may not be easily available to novice motorcycle operators in some States or geographic areas. Course offerings are limited for several reasons. Course size is restricted to 12 students. The number of courses is limited by the number of qualified instructors, the availability of classroom and range locations, and funding (student fees do not cover all course costs in many States). So it's no surprise that courses at some times and in some locations can fill up quickly and discourage prospective students. In the late 1990s, NAMS estimated that fewer than half of those who wanted training received it. Informal reports suggested that waiting times of 3 to 12 months were not unusual in some States. In 2001, nine States reported data on the proportion of new motorcycle licensees who had received formal motorcycle training. Across the nine States, the proportion ranged from 5 percent to 67 percent; in the median State, 32 percent of new licensees had been trained (Baer, Cook, and Baldi, 2005).

Training demand is highest in spring and early summer, especially in cold-weather States, many of which do not offer training in colder months. The typical basic rider course begins with 4 to 5 hours in the classroom followed by 10 hours on the range. This can be scheduled in one weekend (Friday evening classroom, then 5 range hours both Saturday and Sunday) or on weekdays using a similar three-day schedule. Other courses split the classroom and range sessions into two blocks, scheduled over two weekends (Friday evening classroom, then 5 range hours either Saturday or Sunday) or in the evenings over two weeks (Monday evening classroom, then 2.5 range hours each on two other evenings).

Some States increased their training offerings in recent years to accommodate their demand. For example, California increased the number of training sites from 63 in 2002 to 88 in 2004, which provided capacity for approximately 30,000 additional students per year, and also increased the

number of qualified instructors. In 2004 and 2005, more than 100,000 California students enrolled in a BRC compared to fewer than 80,000 in the two prior years. Pennsylvania increased the number of training sites from 43 in 1999 to 70 in 2006.

Across the country, MSF now estimates that a typical waiting time for training is 60 days or less. However, some States still find that their courses fill up very quickly, as noted in this report from one State's regional training center:

“We have received enough money in our contract ... to conduct a total of 332 courses (304 Basic courses and 28 Experienced courses) within our region this year. Two days after our 2006 schedule was released, 151 of those courses were fully enrolled, some with stand-bys.”

Training course availability varies substantially from State to State. Each State should examine its own training offerings and demand to see if adjustments or expansion are appropriate.

Action steps:

- Increase State motorcycle training offerings early in the riding season, when demand is highest.
- Use the Internet to inform riders of training locations, schedules, and availability and to register students online.
- Consider methods to expand operator training capacity such as offering training through private providers, including rider organizations and dealers.
- States ensure that motorcyclist training and licensing fees are retained as dedicated funding to maintain and if necessary increase capacity.
- State motorcycle safety administrators work with the State highway safety offices to identify and secure other stable dedicated funding sources for training.

Promising practices:

- Most States offer courses for intermediate or experienced operators in addition to the basic course. Many States encourage returning riders who wish to enroll in training and who have retained and can demonstrate their basic operator skills to take an intermediate or experienced course rather than repeating a basic course. This makes additional space in the basic course for novice riders.
- Some States also offer training through private providers. Colorado, Maryland, and Texas have increased training numbers substantially due in part to allowing private providers to deliver training.
- Several States, including California, Nevada, Ohio, and Oregon, use mobile training units to provide classes outside the major metropolitan areas (Baer, Baldi, and Cook, 2005, p. 32).
- Illinois and West Virginia list course locations, schedules, and current availability of confirmed and alternate seats on their Web sites (www.dot.state.il.us/cycle.html; wv.msf-usa.org/wv/coursefindwv.aspx).
- Indiana offers training through two Indiana State University campuses, Kokomo Schools, and ABATE of Indiana. ABATE's Web site (www.abateofindiana.org/Default.aspx) lists all course schedules and current availability for its 11 training locations.

- Michigan provides training through authorized public and private organizations. The Michigan Web site (www.michigan.gov/documents/motorcycl_rider_and_safety_education_courses_90018_7.pdf) lists all training locations and provides links to schedules and registration information for each location.
- New Mexico provides course information and registration opportunities through the New Mexico Motorcycle Safety Program (NMMSP) Web site (www.nm-msp.org) and through a toll-free call center (877-667-8880). New Mexico also provides expenses for students under 18 who must travel more than 50 miles to attend a BRC. For information, contact the New Mexico Motorcycle Safety Program at davidsmith4@comcast.net.
- Pennsylvania registers students for all courses centrally, both online (www.pamsp.com/) and by telephone. Either way, students can find complete current information on openings in all courses statewide and can register online or by phone. If a course is full, students can register as an alternate. Alternates must appear before the first class session and will be accepted into the class in the order they registered if seats become available because registered students do not show up. “No-shows” at the beginning of the first class session cannot register for any other course in the current year. Walk-ins also are accepted if seats are available at the first session after all registered students and alternates have been admitted. Idaho and Oregon also register students on-line.
- In 2006, Minnesota motorcycle dealers and related businesses can purchase ERC Skills Plus courses for their customers for \$300 each from the Minnesota Motorcycle Safety Center. Dealers who purchase these ERCs are required to provide the slots free to participants.
- Oregon provides special interest courses for rider groups and organizations. For information, contact Team Oregon at team.oregon@oregonstate.edu.
- Pennsylvania offers the ERC to private clubs and organizations to train their members and guests. The course has been offered through ABATE, GoldWing, H.O.G., and BMW clubs.

Resources and supporting activities:

- MSF provides a national directory of MSF course locations and contact information (www.msf-usa.org).
- SMSA provides software to its members to help States predict training demand and capacity (www.smsa.org).
- NHTSA and SMSA are creating professional development workshops to assist States in improving their operator training programs and to increase capacity to meet student demands and reduce backlogs.
- NHTSA will award demonstration grants to States to promote the implementation of successful practices in administering operator training programs.
- Starting in 2006, NHTSA will award grants to States to support operator training, as authorized by Section 2010 of SAFETEA-LU.

Strategy 3.2: Training promotion – Promote State training classes and availability through dealers, manufacturers, rider groups, rider media, the internet, and other appropriate methods.

Promotion for any course should inform potential students of the course's content, audience, schedule, costs, and benefits. Training promotion can emphasize the link with motorcycle licensing.

Action steps:

- Rider groups encourage members to be trained and licensed; encourage more experienced operators to enroll in ERC or other experienced operator courses.
- Dealers and manufacturers promote proper training and licensing at point of sale.
- State Motor Vehicle Departments provide training information when customers are obtaining motorcycle operator learner permits and motorcycle registration plates.

Promising practices:

- Many States promote their training and licensing programs on State Web sites and at motor vehicle departments.
- Dealers in several States distribute State rider training brochures and tie informational hangtags on motorcycles in their showrooms (Baer, Baldi, and Cook, 2005, p. 34). Some dealers offer vouchers to offset training costs. Some dealers provide reserved spaces at training courses. Pennsylvania promotes training through routine mailings to dealers.
- Starting in 2006, Minnesota riders who take basic and advanced motorcycle safety training will receive lapel pins or embroidered patches from the Minnesota Motorcycle Safety Center. Different colors indicate riders who have passed the BRC, ERC, a second ERC, or advanced training such as instructor certification. For information, see (www.dps.state.mn.us/mmsc/latest/MMSCHomeSecondary.asp?cid=4&mid=243).
- California, Pennsylvania, and West Virginia provide each student who completes the BRC with a special patch or helmet decal.
- In New Mexico, many insurance companies offer insurance premium discounts for graduates from a BRC or ERC training program.
- In New York, motorcyclists who complete the basic rider course are eligible for a reduction of up to four points from their license record and a 10-percent reduction on the base rate of their automobile and motorcycle liability and collision insurance premiums for three years. For information, see www.nysgtsc.state.ny.us/mcyc-ndx.htm#Programs.
- Pennsylvania's Motorcycle Safety Program is free to all Pennsylvania residents. Students are encouraged to take both the BRC and ERC as many times as they wish. Some riders do re-take the courses.
- California distributes over 240,000 posters, brochures, and other literature annually promoting their courses to any high school, college, DMV office, franchised motorcycle dealership, and any other entity that requests information through a toll free number. The California Motorcycle Program Project Manager has had television interviews on major stations in Los Angeles, Monterey/Salinas, and Sacramento and radio interviews in San Francisco, San Jose, and Los Angeles. The interview messages included motorist awareness and motorcycle safety program contact information. Each successful student receives a reflective CMSP helmet decal that includes the training information phone number and URL.
- Idaho works with their rider groups to promote training through the groups' calendar of rides (Baer, Baldi, and Cook, 2005, p. 34).

- Oregon produces free-standing information kiosks that are distributed to motorcycle dealers. The kiosks contain rider training information, schedules, and frequently asked questions. For information, contact Team Oregon at team.oregon@oregonstate.edu.
- West Virginia produced a 10-week radio show that aired on Saturday mornings. The show promoted motorcycle training, licensing, safe riding practices, and sharing the roadways (West Virginia Motorcycle Program Coordinator, 304-558-1041, jtyree@dot.state.wv.us).

Resources and supporting activities:

- MSF provides a variety of information publicizing training (www.msf-usa.org).

Strategy 3.3 Training curricula and quality control – Include key safety issues in training and education for both novice and experienced motorcyclists; monitor training quality.

Important subjects include information on roadway and other vehicle hazards; safe riding practices including braking, lane use, and defensive riding strategies; the dangers of alcohol and other drugs; the importance of wearing FMVSS 218-compliant helmets and other protective equipment; and strategies for the conspicuity of motorcycles and their riders. Training quality should be monitored regularly both through student evaluations and independent reviews.

Action steps:

- States establish and administer training quality assurance programs.
- State motorcycle safety administrators, working with rider groups and others, review motorcycle training curricula to be sure that important safety issues are appropriately addressed.

Promising practices:

- Many States have a training quality control program in place. Two examples follow.
- California uses four quality control methods.
 - Student surveys: The California Motorcycle Safety Program (CMSP) and the California Highway Patrol (CHP) developed a student satisfaction survey. Each student is given a survey, which students return directly to the CHP.
 - “Secret Shoppers”: The Secret Shoppers are not given any specific instructions other than to simply enroll and participate in the class. The Secret Shopper reports are returned to the CHP and are shared with the training site and CMSP.
 - Official quality control visits: Each training site receives a minimum of two half-day quality assurance visits from CMSP each calendar year.
 - Unannounced visits: CHP also conducts unannounced training site visits throughout the year.
- Pennsylvania’s quality control program includes:
 - Site visits: Over 650 site visits annually with over 400 written evaluations of individual instructors.
 - Student surveys: Random surveys are mailed to students. Some 3,400 were returned and reviewed in 2005. Students’ overall rating was 4.63 out of 5.0.

- Instructor training evaluation: Beginning in 2006, each new instructor is given the opportunity to evaluate each of their trainers at the conclusion of their instructor training.
- Instructor updates: 16 annual instructor updates are held. Instructors are required to attend an update to remain certified and also must also teach three entire classes per year. Attendees at the updates have the opportunity to complete evaluation forms to provide input for future updates. They also are invited to evaluate their State coordinator.
- MSF, which provides the curricula used in most States, has an active quality control and research program.
 - MSF reviews all student feedback – 10,000 surveys annually – to determine if the curriculum poses any safety issues for its students.
 - MSF gathers feedback from its instructors (RiderCoaches) through a yearly survey to gain information about the effectiveness of the curricula.
 - MSF initiates at least one research project annually to evaluate curriculum components and investigate any new promising practices suggested by its training community.
 - MSF has begun work on a multiyear cooperative project with NHTSA to study the effects of rider training on crash-avoidance skills.
- Oregon evaluated the available training curricula against the causal factors observed in their motorcycle crashes and modified the courses to better meet their objectives. For information, contact Team Oregon at team.oregon@oregonstate.edu.

Resources and supporting activities:

- MSF provides a variety of information supporting training including MSF/PERSPECTIVES (online.msf-usa.org/perspectives/), an online newsletter focused on contemporary topics in rider safety education and training, and Safe Cycling, a quarterly newsletter for trainers, training program administrators, and others in the training community (www.msf-usa.org).
- NHTSA and MSF are planning a multiyear study to evaluate the effectiveness of current MSF rider education and training curricula for improving rider crash avoidance skills.
- See resources for specific topics elsewhere in this guide: alcohol (Strategy 1.1), protective equipment (2.1), training (3.2), and licensing (4.2).

Strategy 3.4: Training and licensing – Integrate training and licensing to create one-stop operations and to increase the number of motorcycle operators who are both properly trained and licensed.

A strong incentive for many motorcyclists to be trained is so that they can be properly licensed. This incentive is greater in those States that waive the licensing knowledge test for course graduates, is greater yet in States that also waive the skills test, and is highest in States that provide a “one-stop shop” in which students receive their motorcycle endorsement at the end of their training course, without a separate trip to the licensing agency. While motorcycle training and licensing are housed in different administrative units in many States, all States should

coordinate the two functions closely to encourage as many motorcyclists as possible to be both properly trained and licensed.

Action steps:

- State motorcycle safety administrators and motor vehicle administrators provide as close coordination as possible between training and licensing.

Promising practices:

- Maryland and Pennsylvania have “one-stop shops” which provide a motorcycle endorsement immediately upon successful completion of a State-approved basic riding course. As Pennsylvania describes the process in its Web site: “Upon successful completion of the BRC, your learner's permit will be stamped as a valid PA motorcycle license and the requirement for you to test at the PENNDOT Driver License Center is waived. The Department of Transportation will issue a motorcycle license within 120 days of successful completion of the BRC” (www.pamsp.com/CourseInfo_Basic.aspx). Pennsylvania also provides a motorcycle endorsement for experienced rider course graduates. This encourages unlicensed riders with some riding experience to become licensed through a course designed for them.
- Forty-five States waive the skills test and 21 waive the knowledge test for motorcycle operators who have successfully completed an approved training course.

Resources and supporting activities:

- AAMVA’s *Motorcycle Operator Licensing System* (1997; ntl.bts.gov/card_view.cfm?docid=5417) and *Integrating Motorcycle Rider Education and Licensing* (www.aamva.org) manuals provide guidelines for State motorcycle licensing programs. AAMVA is updating these manuals under a cooperative agreement with NHTSA.

Strategy 3.5: Communications – Create and disseminate effective communications campaigns to educate motorcyclists about important motorcycle safety issues.

Communications campaigns can inform and remind motorcyclists of ways to increase their safety while riding. The keys to effective communications are to select relevant issues and content, use messages and materials that motorcyclists will understand and believe, and deliver communications through media and other methods that reach motorcyclists efficiently and effectively.

Action steps:

- State motorcycle safety administrators, State highway safety offices, and rider groups collaborate to create messages and materials that motorcyclists will understand and believe.
- Distribute communications through rider groups, rider media, dealers, local news, and law enforcement media.
- State motorcycle safety program representatives attend rider group meetings, functions, and rallies to inform riders of key issues.

Promising practices:

- Many State motorcycle program Web sites include information for motorcyclists on safe riding issues.
- See suggestions for specific topics elsewhere in this guide: alcohol (Strategy 1.1), protective equipment (2.1), training (3.2), and licensing (4.2).
- Minnesota's annual public information campaign uses television, radio, print, and the internet. Topics have ranged from rider training and licensing, rider skills, impaired riding, and protective gear. For examples, see www.dps.state.mn.us/mmssc/latest/MMSChome.asp?cid=1 or contact the Minnesota Motorcycle Safety Center Information Officer, 651-282-2916 or Pat.hahn@state.mn.us.
- New Mexico's annual Motorcycle Awareness Day uses radio and print to publicize the event. Information on rider training courses, alcohol awareness, protective equipment and other motorcycle specific topics is provided to the general public. For information, contact the New Mexico Motorcycle Safety Program at davidfsmith4@comcast.net.
- Oregon's motorcycle safety instructor list-serve provides a forum for sharing information quickly and efficiently among instructors.

Resources and supporting activities:

- Materials on a variety of training and education topics are available from SMSA, MSF, AMA, NHTSA, ABATE chapters, the Gold Wing Road Riders Association (GWRRA), and other organizations.

References and notes for Section 3, Motorcycle operator training and education

NAMS recommendations for States and communities on motorcycle operator training and education.

6. Explore public service announcements, advertising in enthusiast and near-enthusiast media, and any other viable avenues for distributing safety information.
9. Expand motorcycle safety programs to accommodate all who need or seek training.
11. Merge rider education and training and licensing functions to form one-stop operations.
38. Remind motorcyclists that they may be overlooked and provide defensive strategies for overcoming this situation.
57. Provide additional training and education on proper braking and panic-braking techniques.
59. Educate users about how modifications and loads can change the operating characteristics of their motorcycles.
61. Encourage motorcyclists to enhance their conspicuity.
66. Educate motorcyclists about lane-use strategies, including HOV lane usage.
72. Educate motorcyclists about the hazards created by common roadway defects and maintenance methods. Emphasize riding skills required to negotiate these hazards through education and training.
76. Educate motorcyclists about strategies to overcome the challenges that the designs of other vehicles create in the traffic environment.

General references on motorcycle operator training and education.

- Baer, J.D., Baldi, S., and Cook, A.L. (2005). *Promising Practices in Motorcycle Rider Education and Licensing*. DOT HS 809 922. Washington, DC: National Highway Traffic Safety Administration.
www.nhtsa.dot.gov/people/injury/pedbimot/motorcycle/MotorcycleRider/. Promising practices from five States (Delaware, Idaho, Maryland, Nevada, and Oregon).
- Baer, J.D., Cook, A.L., and Baldi, S. (2005). *Motorcycle Rider Education and Licensing: A Review of Programs and Practices*. DOT HS 809 852. Washington, DC: National Highway Traffic Safety Administration.
www.nhtsa.dot.gov/people/injury/pedbimot/motorcycle/McycleRiderWeb/pages/index.htm. A summary of motorcycle operator education and licensing practices across the States and a listing of each State's practices as of 2001, from 38 States.
- The MSF Web site (www.msf-usa.org) provides extensive information about MSF courses including training locations, schedules, and costs, as well as information on each State's licensing requirements.
- Information on the Harley-Davidson Rider's Edge new rider, skilled rider, and group courses is available at www.ridersedge.com.

Section 4. Licensing

Overview

All 50 States and the District of Columbia require motorcyclists to obtain a motorcycle operator license or endorsement before they ride on public highways. The goal of licensing is to ensure that motorcyclists have the minimum knowledge and skills needed to operate a motorcycle safely.

However, many motorcyclists are not properly licensed. In 2005, 24 percent of motorcycle operators involved in fatal crashes did not have a valid motorcycle license, compared to 12 percent of drivers of passenger vehicles who were not properly licensed. Many of these motorcyclists did have a driver's license but not a motorcycle endorsement.

State motorcycle licensing practices vary substantially. Most States have a learner's permit requiring only vision and knowledge tests. Motorcyclists with a learner's permit can ride only in restricted circumstances, typically some combination of no passengers, only during daylight hours, and only with the supervision of a fully licensed motorcyclist. A skills test is required for full licensure. Two-thirds of the States use one of three tests developed by the MSF and AAMVA while one-third use their own tests. See Baer, Cook, and Baldi (2005) for a summary of each State's licensing requirements and procedures and MSF (www.msf-usa.org) for a list of State licensing and registration requirements as of 2002. NCHRP (under review, Strategy D1) summarizes the major skills tests currently in use by licensing agencies.

Objective: Ensure that all motorcycle operators riding on public roads are properly licensed.

Strategy 4.1: Administration – Identify and remove barriers to obtaining a motorcycle license.

Barriers to obtaining a motorcycle license include limited and inconvenient licensing examination hours, which sometimes require appointments weeks or months in advance, and licensing systems in some States that provide no incentive to become fully licensed because learner's permits may be renewed indefinitely.

Action steps:

- State motorcycle safety administrators and motor vehicle administrators examine the relationship between training and licensing and integrate motorcycle operator training and licensing into one-stop operations (see Strategy 5.3).
- State motor vehicle administrators offer licensing examinations during evening and weekend hours.

Promising practices:

- Minnesota offers licensing exams during evening hours (www.dps.state.mn.us/mmssc/latest/MMSCHome.asp?cid=1).

- Forty-five States waive the skills test and 21 waive the knowledge test for motorcycle operators who have successfully completed an approved training course.

Resources and supporting activities:

- AAMVA's *Motorcycle Operator Licensing System* and *Integrating Motorcycle Rider Education and Licensing* manuals provide guidelines for State motorcycle licensing programs (www.aamva.org). AAMVA is updating these manuals in 2006 under a cooperative agreement with NHTSA.

Strategy 4.2: Promotion – Encourage motorcycle operators to be properly licensed.

Motorcycle license promotion should inform motorcycle operators of the advantages of and incentives for proper licensure as well as providing information on licensing requirements and procedures. Promotion also should inform operators of the potential consequences of riding while not properly licensed.

Action steps:

- Promote the advantages of proper licensing through dealers, rider groups, rider media, State highway patrol and local law enforcement motorcycle officers and other appropriate methods.
- State highway safety offices, State motorcycle safety administrators, and law enforcement inform motorcycle operators of the potential consequences of operating a motorcycle without a proper license.

Promising practices:

- Many States have motorcycle operator licensing information and motorcycle operator handbooks available on their Web sites.
- Maryland's DMV compared their motorcycle registration and motorcycle operator licensing files. They then sent a letter to each owner of a registered motorcycle who did not have a motorcycle operator's license. This quick and inexpensive strategy caused 1,700 owners to become licensed within four months. For information, contact the Maryland Motor Vehicle Administration at 410-424-3731 or akrajewski@mdot.state.md.us. In 2006, Ohio will send letters to over 10,000 to non-licensed motorcycle owners to encourage licensing. For information, contact the Ohio Motorcycle Coordinator at 614-466-4042 or bsecrest@dps.state.oh.us.

Resources and supporting activities:

- MSF provides a variety of information publicizing proper licensing (www.msf-usa.org).

Strategy 4.3: Quality – Train license examiners in motorcycle license testing techniques.

Licensing tests serve as a valid measure of motorcycle operator skills and knowledge only if license examiners are properly trained and qualified. Just as automotive license examiners need

specialized training and skills beyond those needed to drive a car, motorcycle license examiners need specialized training, knowledge, and skills.

Action steps:

- Certify all motorcycle license examiners through the AAMVA Certified Motorcycle Examiner program.
- Increase the number of examiners qualified to test motorcyclists if needed.

Promising practices:

- The AAMVA Certified Motorcycle Examiner program was developed in cooperation with the MSF to recognize and certify examiners. To become certified, examiners must complete a minimum of one year as a full-time on-the-job driver examiner actively conducting motorcycle skills or road tests and must pass an examination. For information, see <http://www.aamva.org/EducationTraining/Programs/CertifiedMotorcycleExaminerCME.htm>.

Some State motorcycle safety programs, for example in Idaho, Oregon, and Washington, collaborate with their motor vehicle departments to train license examiners.

Resources and supporting activities:

- The 2005 Certified Motorcycle Examiner program overview is available from AAMVA at <http://www.aamva.org/EducationTraining/Programs/CertifiedMotorcycleExaminerCME.htm>.

Strategy 4.4: Enforcement – Actively enforce penalties for operating a motorcycle without a proper license or endorsement.

Law enforcement should routinely check for a proper motorcycle operator's license or endorsement when stopping a motorcyclist for any potential traffic violation, as they do for other vehicle operators. To do this, officers must be able to recognize a valid operator's license or endorsement.

Action steps:

- Law enforcement patrol officers adopt a zero tolerance approach to enforcing improper motorcycle operator licensure by checking for a proper motorcycle endorsement and issuing citations for an improper license or endorsement.
- State highway safety office law enforcement liaisons meet with law enforcement agencies to encourage zero tolerance of improperly licensed motorcyclists.

Promising practices:

- Law enforcement can raise the importance of motorcycle license enforcement at roll calls, through law enforcement listservs, or through other law enforcement channels.
- Oregon presents information on this issue at State judicial conferences.

Resources and supporting activities:

- No specific resources for this strategy.

References and notes for Section 4, Licensing

NAMS recommendations for States and communities on motorcycle operator licensing.

11. Merge rider education and training and licensing functions to form one-stop operations.
16. Identify and remove barriers to obtaining a motorcycle endorsement.
17. Develop and implement programs to allow all state motorcycle safety programs to issue motorcycle endorsements immediately upon successful completion of rider training courses.
18. Enforce penalties for operating a motorcycle without a proper endorsement.
19. Encourage states and jurisdiction to provide motorcycle specific training to license examiners administering testing for motorcyclists.

General references on motorcycle operator licensing.

- Baer, J.D., Cook, A.L., and Baldi, S. (2005). *Motorcycle Rider Education and Licensing: A Review of Programs and Practices*. DOT HS 809 852. Washington, DC: National Highway Traffic Safety Administration.
www.nhtsa.dot.gov/people/injury/pedbimot/motorcycle/McycleRiderWeb/pages/index.htm. A summary of motorcycle operator education and licensing practices across the States and a listing of each State's practices as of 2001, from 38 States.
- Baer, J.D., Baldi, S., and Cook, A.L. (2005). *Promising Practices in Motorcycle Rider Education and Licensing*. DOT HS 809 922. Washington, DC: National Highway Traffic Safety Administration.
www.nhtsa.dot.gov/people/injury/pedbimot/motorcycle/MotorcycleRider/. Promising practices from five States (Delaware, Idaho, Maryland, Nevada, and Oregon).
- The MSF Web site (www.msf-usa.org) lists State licensing and registration requirements as of 2002.
- NCHRP (under review). *Guide for Addressing Collisions Involving Motorcycles*, Strategy D3, Identify and remove barriers to obtaining a motorcycle endorsement. When released, the guide will be available at www.ch2m.com/nchrp/over/default.htm.
- AAMVA's *Motorcycle Operator Licensing System* and *Integrating Motorcycle Rider Education and Licensing* manuals provide guidelines for State motorcycle licensing programs (www.aamva.org). AAMVA is updating these manuals in 2006 under a cooperative agreement with NHTSA.

Section 5. Motorist education

Overview

When motorcycles crash with other vehicles, the other vehicle driver often violates the motorcyclist's right-of-way. For example, 2005 FARS data show that in 38 percent of the two-vehicle fatal crashes involving a motorcycle, the other vehicle was turning left while the motorcycle was going straight, passing, or overtaking the vehicle. Motorcycles and motorcyclists obviously are a smaller visual object than cars or trucks. Other motorists may misjudge the distance and speed of an oncoming motorcycle because of its smaller size. Motorcyclists may not be conspicuous. Other motorists may not expect to see motorcycles on the road and may not be familiar with motorcycle riding practices.

Other vehicle drivers should be educated and reminded to be aware of motorcycles on the road and to drive safely near motorcycles. Many motorcycle rider organizations currently sponsor motorist awareness activities.

Motorist education regarding motorcycles can begin early, through driver education classes, driver licensing manuals, and questions on driver licensing exams. It can be a part of remedial traffic safety courses required for problem drivers, especially those who have been involved in a crash with a motorcycle. It can be reinforced through regular communications campaigns.

Objective: Increase motorists' awareness of the presence of motorcycles on the road.

Strategy 5.1: Communications – Educate motorists to be more aware of the presence of motorcyclists.

Many States have conducted communications and outreach campaigns to increase other drivers' awareness of motorcyclists. Typical themes are "Share the Road" or "Watch for Motorcyclists." Some States build a campaign around Motorcycle Awareness Month in May, early in the summer riding season. Many national, State, and local motorcyclist organizations conduct motorcycle awareness activities and have materials available.

Action steps:

- State motorcycle safety administrators and State highway safety offices create and disseminate effective communications to all drivers on motorcyclist awareness.
- Other State agencies that conduct business with the motoring public, such as State insurance commissioners, create and disseminate effective communications to all drivers on motorcyclist awareness.
- Businesses with fleet drivers create and disseminate effective communications to employees on motorcyclist awareness.

Promising practices:

- Many States designate a motorcycle awareness month or conduct motorcycle awareness campaigns. Recent examples include:
 - Alaska (gov.state.ak.us/archive.php?id=937&type=6)
 - Georgia (www.gahighwaysafety.org/2006moto/)
 - Idaho (gov.idaho.gov/mediacenter/proc/proc04/procmay/proc_motorcycle.htm)
 - Iowa (www.iowamre.com/awarenessmonth.htm)
 - Michigan (home.att.net/~ericmlarson/may/)
 - Minnesota (www.dps.state.mn.us/mmsc/latest/MMSCHomeSecondary.asp?cid=4&mid=17&scat=1)
 - New Mexico (ipl.unm.edu/traf/Newsletter/06May.pdf)
 - New York (www.nysgtsc.state.ny.us/mc-proc.htm)
 - West Virginia (www.wv-msp.org/)
- State and local rider groups promote rider awareness:
 - Illinois ABATE (www.abate-il.org/pr/pr.htm)
 - California AMA District 37 (www.district37ama.org/roadrider/proclamation.php)
- Oregon's State motorcycle safety program developed a motorcycle awareness presentation for use with civic and business organizations and meetings. For information, contact Team Oregon at team.oregon@oregonstate.edu.

Resources and supporting activities:

- AMA encourages and supports motorist awareness through its "Motorcyclists Matter" program (www.amadirectlink.com/legisltn/motorcyclistsmatter/program.asp).
- The Gold Wing Road Riders Association provides motorist awareness graphic art materials for their "Ride Aware" campaign (www.gwrra.org/regional/MAD/).
- MSF provides PSAs, press releases, posters, roadside billboards, and other motorist awareness material (http://www.msf-usa.org/index_new.cfm?spl=2&action=display&pagename=Librarynew.cfm?pagename=Search&content=12D63D09-A0CC-53D5-64764948F882EC77&).
- SMSA provides promotional materials, an idea sampler, and a downloadable radio PSA (www.smsa.org/motorcycle_awareness/).
- NHTSA provides information on motorist awareness in its Motorcycle Safety Awareness Month program planner (www.nhtsa.dot.gov/people/injury/pedbimot/motorcycle/McycleSafetyplanner2006/pages/index.htm).

Strategy 5.2: Driver education and licensing – Include information on motorcycles in high school driver education curricula, State driver manuals, State driver's license tests, and State traffic safety courses for problem drivers.

Information on motorcycles should be included in standard automobile driver training and licensing materials and curricula. Motorcycle safety organizations and rider groups can take the lead to review these materials and point out any deficiencies.

Action steps:

- State motorcycle safety administrators and rider groups work with State motor vehicle administrators to review driver manuals and license tests, identify key information regarding motorcycles that should be included, and suggest appropriate additions or changes.
- State motorcycle safety administrators and rider groups review driver education curricula to assure that motorcycles are included appropriately.
- State motorcycle safety administrators and rider groups work with State motor vehicle administrators to review the content of remedial traffic safety courses required for problem drivers, identify key information regarding motorcycles that should be included, and suggest appropriate additions or changes.
- State motorcycle safety administrators and rider groups work with organizations that provide travel information to motorists (such as State tourism or road condition Web sites, AAA, etc.) to notify drivers of motorcycle events and rallies.

Promising practices:

- Nevada and Oregon include information about motorcycles in automobile driver handbooks. Nevada has four questions about motorcycles in the automobile license written test.
- California, Louisiana, Maine, Massachusetts, New York, Virginia, Washington, and West Virginia include motorcycle safety awareness information in their driver education program.
- New Mexico provides motorcycle awareness information and motorcycle rider training information to all annual automobile drivers course instructor update training certification classes. For information, contact the New Mexico Motorcycle Safety Program at davidfsmith4@comcast.net.
- California distributes the MSF's "A Common Road" kit at no charge to instructors who can arrange to deliver the program in schools.
- GWRRA and other rider groups make presentations to driver education classes on drivers' awareness of motorcyclists.

Resources and supporting activities:

- Many State driver handbooks are available for review at State motor vehicle department Web sites.
- MSF has prepared a "Sharing the Roadway" insert on motorcycle awareness that is available for automobile driver handbooks.
- MSF's video "A Common Road" and supporting material are available for use nationwide in high school driver education classes and by companies that employ commercial drivers.
- In 2006 NHTSA developed model language on sharing the road safely with motorcyclists for use in driver education courses, driver manuals, and other communications and information activities.

References and notes for Section 5, Motorist education

NAMS recommendations for States and communities on motorist education.

- 37. Educate operators of other vehicles to be more conscious of the presence of motorcyclists.
- 39. Include questions regarding motorcyclists on driver's license tests and include information in driving manuals.
- 40. Include the completion of a motorcyclist awareness class in sanctions against motorists found guilty of violating a motorcyclist's right-of-way.
- 49. Appropriate sanctions should be applied to those found guilty of contributing to motorcycle crashes. The sanctions, such as mandatory attendance at a motorcycle awareness course, would be designed to expand knowledge of motorcycle issues.

General references on motorist education.

NCHRP (under review), Strategy A7, provides additional discussion and examples.

Section 6. Highway and environment

Overview

Roads should be designed, built, and maintained to accommodate the safety needs of all vehicles, including motorcycles, and many roads meet this goal well. However, some roadway construction and maintenance features that address the safety of four-wheeled vehicles may be hazardous to motorcyclists. Some environmental conditions cannot be avoided, such as wet roads, which affect motorcycles far more than other vehicles. But many risks can be eliminated or reduced. Pavement ridges, potholes, manhole covers, railroad grade crossings, slippery pavement markings, steel plates, debris, and fluid spills all can affect motorcycle traction. Roadside barriers and sign supports can be dangerous when struck by motorcyclists. NCHRP (under review), Strategies A1 through A9, provides substantial discussion and examples of many roadway and environmental issues related to motorcycle safety.

Objective: Accommodate the safety needs of motorcyclists in road design, construction, and maintenance.

Strategy 6.1: Signage – Post specific warnings for motorcycle operators where hazardous conditions exist.

If hazardous permanent roadway features cannot be modified, motorcyclists should be warned of them through appropriate roadside signage.

Action steps:

- State departments of transportation and county and municipal highway offices inventory potentially hazardous sites and erect appropriate signage.
- State departments of transportation and county and municipal highway offices establish and promote communication channels for public to report hazardous sites.
- Riders and rider groups inform State departments of transportation and county and municipal highway offices of hazardous sites.

Promising practices:

- Illinois, New Hampshire, Oregon, Virginia, and other States use motorcycle-specific signage for various potential hazards.
- Many cities and regions have established pothole hotlines and internet notification systems for roadway hazards.
- See the comprehensive roadway motorcycle safety strategies used in Oregon, Pennsylvania, and Virginia, discussed in Strategy 6.3.

Resources and supporting activities:

- NCHRP (under review), Strategy A7, documents several examples.

Strategy 6.2: Maintenance – Reduce roadway debris; remove slippery sealants and road repair substances.

Roadway debris can be hazardous to all vehicles but can be especially dangerous to motorcycles. Similarly, slippery repair substances and roadway markings can be dangerous.

Action steps:

- State departments of transportation and county and municipal highway offices consider motorcyclists' needs in all decisions on roadway maintenance, repair, and construction.
- State departments of transportation and county and municipal highway offices establish and promote communication channels for public to report hazardous conditions.
- Rider groups inform State departments of transportation and county and municipal highway offices of hazardous conditions.

Promising practices:

- See the comprehensive roadway motorcycle safety programs used in Oregon and Virginia, discussed in Strategy 6.3.

Resources and supporting activities:

- NCHRP (under review), Strategies A4-A6, provides extensive discussion and examples.

Strategy 6.3: Education – Educate road design and maintenance personnel about conditions that pose hazards to motorcycle operators.

If motorcycle safety is included in highway design, construction, and maintenance planning, then many conditions hazardous to motorcyclists can be eliminated or reduced. The first step is to educate design and maintenance management and staff regarding motorcycle safety issues that differ from the safety issues of four-wheeled vehicles.

Action steps:

- State departments of transportation and county and municipal highway offices meet with rider groups to discuss issues of concern.
- State departments of transportation and county and municipal highway offices incorporate motorcycle safety as a standard component of all training and operations, including routine roadway inspections, hazardous location studies, and traffic control and signage reviews.

Promising practices:

- Virginia formed a Motorcycle Safety Action Team whose actions included motorcycle information and education for highway engineers, revisions to the work zone manual, motorcycle-specific signage, and antiskid treatments for steel plates. For information, contact the Virginia Department of Transportation at Mark.Hodges@VDOT.Virginia.gov.
- The Oregon Department of Transportation consults with TEAM OREGON, the Oregon motorcycle safety and training center, when questions arise about a surface treatment's

affect on motorcycles. For information, contact Team Oregon at team.oregon@oregonstate.edu.

- The Pennsylvania State Motorcycle Safety Coordinator participates in the Governor's Strategic Highway Initiative and the Pennsylvania Mobility Plan where highway planning takes place. His participation ensures that motorcycling issues are included in the discussions and given priority.

Resources and supporting activities:

- No specific resources identified for this strategy.

References and notes for Section 6, Highway and environment

NAMS recommendations for States and communities on highway and environment

- 70. Post specific warnings for motorcyclists where unavoidable hazards exist.
- 73. Take steps to remove slippery sealants and repair substances applied to road surfaces.
- 74. Educate road design and maintenance personnel about conditions that pose hazards to motorcyclists.
- 75. Reduce roadway debris such as that resulting from uncovered loads and shorn retreads.

General references on highway and environment

- NCHRP (under review). *Guide for Addressing Collisions Involving Motorcycles*. Strategies A1 through A9 provide substantial discussion and examples of many roadway and environmental issues related to motorcycle safety. When released, the guide will be available at www.ch2m.com/nchrp/over/default.htm.
- The Federal Highway Administration (FHWA) provides extensive information on highway design, construction, and maintenance (www.fhwa.dot.gov/).

Section 7. Management

Overview

The State and community motorcycle safety activities discussed in the first six sections all require effective management. Effective management includes planning, administration, evaluation, and funding. Effective management of motorcycle safety activities should include close communications, coordination, and cooperation with all government entities and constituencies interested in motorcycle safety. The strategies and action steps in this section suggest some specific management practices for motorcycle safety activities.

Objective: Give motorcycle safety the place it deserves within traffic safety programming and funding.

Strategy 7.1: State highway safety offices – Include motorcycle safety as a key component of highway safety program planning and funding.

The recent rise in motorcycle crashes, injuries, and fatalities has increased the importance of motorcycle safety in many State highway safety offices.

Action steps:

- Allocate adequate resources to motorcycle safety program activities based on problem size and program needs.
- Develop a comprehensive motorcycle safety program.
- Establish motorcycle safety goals in annual highway safety plans.
- Integrate motorcycle safety into existing highway safety program activities such as driver licensing, impaired driving enforcement crackdowns, law enforcement SFST training, and traffic safety communication strategies.
- Include a motorcycle safety specialist on the State highway safety office staff.
- Conduct a State motorcycle program assessment (available through NHTSA).

Promising practices:

- Several States, including Illinois and Minnesota, have conducted motorcycle program assessments recently. Some States will share their assessment reports with other States. For information on available reports, contact Michael Jordan, Safety Countermeasures Division, NHTSA, at 202-366-0521 or Michael.Jordan@dot.gov.
- Wisconsin's 2006 Motorcycle Safety Program Plan is available at www.dot.wisconsin.gov/library/publications/topic/safety/hwysafetyplan-motorcycle.pdf. For more information, contact the Wisconsin Department of Transportation at 608-266-7855 or ron.thompson@dot.state.wi.us.

Resources and supporting activities:

- NHTSA's Motorcycle Safety Program Guideline outlines a comprehensive State program. The Guideline and other NHTSA motorcycle program resources are available at

www.nhtsa.dot.gov/people/injury/pedbimot/motorcycle/general.htm. NHTSA plans to update this guideline in 2006.

- NHTSA will help States plan and conduct motorcycle program assessments. For general information on program assessments, see www.nhtsa.dot.gov/safecommunities/Strive/contents.html. To discuss motorcycle program assessments, contact Michael Jordan, Safety Countermeasures Division, NHTSA, at 202-366-0521 or Michael.Jordan@dot.gov.
- Nine of the 10 NHTSA Regions have included motorcycle safety as a priority on their 2006 action plans.
- MSF has developed a motorcycle training course management system as a tool for managing course enrollment, paperwork, and quality assurance activities.

Strategy 7.2: Education – Educate law enforcement officers, prosecutors, judges, and traffic safety organizations on motorcycle safety issues.

Motorcycle safety presents specific issues and concerns that many persons involved with traffic safety may not know. For each constituency, education first must raise awareness of the relevant motorcycle safety issues and then must provide the specific information that each constituency needs.

Action steps:

- Include motorcycle crash procedures in crash investigation training for law enforcement officers.
- Inform law enforcement patrol officers of traffic safety issues unique to motorcyclists, such as alcohol impairment cues and HOV regulations. State highway safety office law enforcement liaisons meet with law enforcement agencies to discuss motorcyclist safety issues and encourage agencies to enforce motor vehicle and traffic safety laws affecting motorcycles and motorcyclists.
- Include a motorcycle component in judicial education programs.
- Rider groups help inform other traffic safety organizations about motorcycle safety issues.

Promising practices:

- New Mexico presents information on available motorcycle operator training programs to Albuquerque Metropolitan Court judges at annual information meetings. In many cases, motorcycle operators who receive moving violations may have their fines or operator license points reduced or dropped if they attend a BRC program. For information, contact the New Mexico Motorcycle Safety Program at davidfsmith4@comcast.net.
- Ohio has motorcycle law enforcement liaisons at Ohio State Highway Patrol posts that will attend motorcycle rider meetings and events to discuss motorcycle safety issues. These officers are brought together for an annual meeting and training by the Patrol and the Motorcycle Ohio program. Also, after 50 years, the Patrol will once again have motorcycle officers. A pilot test starting in June 2006 will put six officers on the road around the Columbus metropolitan area. If successful, motorcycle officer units will be

implemented in other large metropolitan areas of the State. For information, contact Motorcycle Ohio at 800-837-4337.

- The Pennsylvania Motorcycle Safety Program will set up special classes for any law enforcement, fire fighter, or government agency for motorcycle safety education and training.

Resources and supporting activities:

- A brochure and cue card on identifying motorcycle operators impaired by alcohol is available from NHTSA: The Detection of DWI Motorcyclists, DOT HS 807 856, 2005, www.nhtsa.dot.gov/people/injury/pedbimot/motorcycle/610DWIMotorcyWeb/pages/.
- NHTSA provides a brochure and video for law enforcement on identifying noncompliant helmets, www.nhtsa.dot.gov/people/outreach/safesobr/21qp/html/program_pubs/moto_Safety.html

Strategy 7.3: Cooperative activities – Include the broad motorcycle safety community (rider groups, dealers, manufacturers, law enforcement, prosecutors, judges, motorcycle friendly businesses) in motorcycle safety planning and implementation activities as appropriate.

The motorcycle safety community is diverse, with all parties contributing both special knowledge and specific concerns. Cooperative planning and implementation can design and implement more effective and efficient activities and can head off potential problems before they develop.

Action steps:

- Establish a State motorcycle safety advisory committee, involving relevant State agencies and the broad motorcycle safety community, to make recommendations on activities and assist with implementation.
- Hold State, regional or metropolitan area motorcycle summits to share issues, establish priorities, and plan activities.
- Conduct multi-State motorcycle safety meetings to share issues, programs, strategies, and lessons learned.
- Integrate motorcycle-related topics into highway safety conferences.
- Include law enforcement, prosecutors, and judges in motorcycle program assessments and other motorcycle safety program activities as appropriate.

Promising practices:

- Several States, including Indiana, Minnesota, New Mexico, New York, and Wisconsin, have active State motorcycle safety advisory committees.
- Wisconsin held a State NAMS summit in 2004, which resulted in an action agenda for the State. For information, contact the Wisconsin Department of Transportation at 608-266-7855 or ron.thompson@dot.state.wi.us.
- NHTSA holds periodic regional motorcycle meetings involving State program officials, law enforcement, motorcycle manufacturers, rider groups, and others. For information on NHTSA's Great Lakes Regional motorcycle meeting in December 2005, contact the NHTSA Great Lakes Regional office at 708-503-8892 or Curtis.Murff@dot.gov. For

information on NHTSA's joint New England and Eastern Regional motorcycle safety forum in December 2004, contact the NHTSA Eastern Regional office at 914-682-6162 or Richard.Simon@nhtsa.dot.gov.

- New Mexico sponsors an annual Motorcycle Advisory Council meeting where principals from the New Mexico Traffic Safety Bureau, the New Mexico Motor Vehicle Division, the New Mexico Motorcycle Safety Program (NMMSP), State and local law enforcement, motorcycle dealers, motorcycle rights organizations, local clubs, motorcycle training instructors, and the general riding public are invited and encouraged to present their viewpoints. Summary data on mishaps, training, law enforcement initiatives, and licensing/vehicle registration policies are presented and discussed. For information, contact the New Mexico Motorcycle Safety Program at davidsmith4@comcast.net.
- In Oregon, State highway safety offices, law enforcement, and rider group leaders share ideas, strategies, and events through a list-serv. For information, contact Team Oregon at team.oregon@oregonstate.edu.
- The Pennsylvania Motorcycle Safety Program hosted a public awareness symposium with the Board of Directors of the Pennsylvania Motorcycle Dealers Association and ABATE senior officers, focusing on issues from the AASHTO Strategic Highway Safety Plan and brainstorming on how to promote motorcycle safety.
- Pennsylvania's Motorcycle Safety Program was an active participant in Pennsylvania's Highway Safety workshops which helped develop a Comprehensive Strategic Highway Safety Improvement Plan. Motorcycle safety is one of the 23 strategic focus areas in the Plan.
- To expand motorcycle operator training capacity, the Pennsylvania Motorcycle Safety Program needed additional funds. ABATE of Pennsylvania initiated and lobbied to provide funds by increasing the fee collected on all motorcycle permits and licenses from \$2 to \$5. The initiative also was supported by the Pennsylvania Motorcycle Dealerships Association.

Resources and supporting activities:

- MSF provides a variety of resources for the motorcycle safety community.
 - The MSF Communications Group publicizes key safety messages for both riders and motorists. Its 24/7 news bureau fields hundreds of inquiries annually from print, broadcast and online journalists and other interested parties. The news bureau distributes news releases, video and still images, and statistics. It provides media-trained experts as spokespeople on subjects including rider education and training, licensing, protective gear, alcohol use, risk management, lifelong learning, and relevant motorist issues. It works with industry, legislators, researchers, government agencies, a variety of rider organizations, the larger training community and others, providing information on a wide range of safety related topics. Many of the materials developed can be found on the MSF Web site www.msf-usa.org.
 - MSF's NAMS grant program awards small grants to motorcyclists, motorcycle rider organizations, and other organizations not associated with the motorcycle industry for programs to enhance motorcycle safety. Grant applications are available at www.msf-usa.org.

- Additional MSF resources are listed in previous sections.
- The Motorcycle Industry Council (MIC) maintains its own 24-hour news bureau with special focus on industry and government relations issues, statistics and research, and activities surrounding technical and regulatory matters. Its two Web sites (www.mic.org and www.motorcycles.org) serve a wide variety of needs within the entire motorcycling community as well as media interests. The MIC media message line is 949-727-4211 ext. 3027 or mediarelations@mic.org.

References and notes for Section 7, Management

NAMS recommendations for States and communities on management

12. Increase the number of states conducting Motorcycle Safety Program Assessments.
41. Adequate funding needs to be devoted to the development and implementation of motorist awareness issues.
45. Educate law enforcement and judicial officials about unique motorcycle safety issues and resources.
46. Encourage inclusion of law enforcement officials in Motorcycle Safety Program Assessments.
48. Include motorcycle crash investigation procedures in the basic course given to crash investigators.
50. Traffic safety organizations outside of the motorcycling community can better influence motorcycle safety issues by becoming more educated about motorcycle safety issues and adopt them where applicable.
51. Increase funding for motorcycle safety programs by elevating their importance to state highway safety offices.
52. Representatives of the motorcycle safety community should be integrated into the larger highway safety community to improve cooperative efforts.
63. Reconsider state requirements that prohibit safe conspicuity-enhancing modifications, including safe modification to lighting systems.

General references on management

- NHTSA's Motorcycle Safety Program Guideline outlines a comprehensive State program. The guideline and other NHTSA motorcycle program resources are available at www.nhtsa.dot.gov/people/injury/pedbimot/motorcycle/general.htm.

Appendix A. NAMS Recommendations in NAMS order

Research and information

A. Research in motorcycle crashes

1. Immediate action should be taken by government and industry to address the critical questions in motorcycle safety through comprehensive, in-depth studies as well as studies focused on specific topics.
2. To better utilize data collected by law enforcement personnel, a uniform traffic crash report for police officers should be developed and deployed. A similar format should also be developed for emergency medical services reports. This will permit meaningful comparisons among jurisdictions. All concerned parties should share the resulting information.
3. Mechanisms for building academic and funding capacity for ongoing and future motorcycle safety research should be explored.

B. Conveying research information to users

4. Create a clearinghouse to distribute current, practical information about motorcycle safety based on recent research.
5. Develop research-based safety information that can be used easily by the consumer media and in rider education and training systems.
6. Explore public service announcements, advertising in enthusiast and near-enthusiast media, and any other viable avenues for distributing safety information.

Human Factors

A. Motorcyclist attitudes

7. Study factors that affect and shape motorcyclists' attitudes and behavior and how they affect crash involvement.
8. Using information about how motorcyclists form attitudes about safety issues, create programs that reduce dangerous behavior and reinforce safe behavior.

B. Rider education and training

9. Expand motorcycle safety programs to accommodate all who need or seek training.
10. Conduct uniform follow-up research into the effectiveness and impact of rider education and training.
11. Merge rider education and training and licensing functions to form one-stop operations.
12. Increase the number of states conducting Motorcycle Safety Program Assessments.
13. Establish benchmarks for rider education and training effectiveness and program operation excellence.
14. Explore the effectiveness of on-street training.

C. Licensing

15. Commission studies to ensure that licensing tests measure skills and behaviors required for crash avoidance.
16. Identify and remove barriers to obtaining a motorcycle endorsement.
17. Develop and implement programs to allow all state motorcycle safety programs to issue motorcycle endorsements immediately upon successful completion of rider training courses.
18. Enforce penalties for operating a motorcycle without a proper endorsement.
19. Encourage states and jurisdiction to provide motorcycle specific training to license examiners administering testing for motorcyclists.
20. Develop an enhanced motorcycle licensing model using appropriate GDL concepts and evaluate its effectiveness.

D. Crash avoidance skills

21. Conduct research to determine which rider crash avoidance skills are most important.
22. Develop countermeasures in training, license testing, and motorcycle technology to address any current crash avoidance deficiencies.
23. Evaluate effectiveness of rider education and training in developing crash avoidance skills.
24. Evaluate the need for motorcycle simulator skills training.
25. Examine technological approaches such as pre-crash warning and avoidance systems to enhance crash prevention.

E. Motorcyclist alcohol and other impairment

26. Study how alcohol, drugs and other substances, including over-the-counter medications, can affect a motorcyclist's operating skills.
27. Study the alcohol, drug and other substance use patterns of motorcyclists.
28. Continue to discourage mixing alcohol and other drugs with motorcycling.
29. Educate law enforcement about unique alcohol-related behavior of motorcyclists.
30. Encourage partnerships with groups already involved in alcohol/substance abuse issues related to motor vehicle crashes, e.g., Mothers Against Drunk Driving (MADD), Students Against Destructive Decisions (SADD).

F. Personal protective equipment

31. Use effective strategies to increase the use of FMVSS 218 compliant helmets.
32. Educate motorcyclists about the value of protective apparel by providing an information source on related research and a forum for the exchange of information.
33. Find ways to more effectively communicate the benefits of helmet use and work toward making voluntary use of FMVSS 218 compliant helmets more widely accepted.
34. Use effective strategies to ensure that all helmets in use meet FMVSS 218.
35. Revise FMVSS 218.
36. Conduct research regarding protective apparel effectiveness, and consider development or adoption of existing standards, if research justifies.

Social Factors

A. Motorist awareness

- 37. Educate operators of other vehicles to be more conscious of the presence of motorcyclists.
- 38. Remind motorcyclists that they may be overlooked and provide defensive strategies for overcoming this situation.
- 39. Include questions regarding motorcyclists on driver's license tests and include information in driving manuals.
- 40. Include the completion of a motorcyclist awareness class in sanctions against motorists found guilty of violating a motorcyclist's right-of-way.
- 41. Adequate funding needs to be devoted to the development and implementation of motorist awareness issues.

B. Insurance industry involvement

- 42. Insurers should write policies that stipulate that coverage or certain portions of coverage are not valid if the owner permits an unlicensed or improperly licensed operator to use the motorcycle.
- 43. Collect, organize, analyze, and distribute motorcycle-specific loss data from insurers to better understand safety issues, and to educate riders and other motorists on motorcycling safety issues.
- 44. Develop guidelines for insurers to tie approved training, licensing, and safe-riding practices to premium reductions.

C. Enforcement and adjudication

- 45. Educate law enforcement and judicial officials about unique motorcycle safety issues and resources.
- 46. Encourage inclusion of law enforcement officials in Motorcycle Safety Program Assessments.
- 47. Develop and implement standardized data gathering and reporting for motorcycle crashes.
- 48. Include motorcycle crash investigation procedures in the basic course given to crash investigators.
- 49. Appropriate sanctions should be applied to those found guilty of contributing to motorcycle crashes. The sanctions, such as mandatory attendance at a motorcycle awareness course, would be designed to expand knowledge of motorcycle issues.

D. Traffic safety community attitude

- 50. Traffic safety organizations outside of the motorcycling community can better influence motorcycle safety issues by becoming more educated about motorcycle safety issues and adopt them where applicable.
- 51. Increase funding for motorcycle safety programs by elevating their importance to state highway safety offices.
- 52. Representatives of the motorcycle safety community should be integrated into the larger highway safety community to improve cooperative efforts.

Motorcycle factors

A. Motorcycle design

- 53. Conduct research to determine how current motorcycle designs affect crash and injury causation.
- 54. Implement the use of available tire and wheel technology and explore technology, such as run-flat tires, to reduce frequency of loss-of-control crashes caused by puncture flats.

B. Braking

- 55. Study the effectiveness of linked and antilock braking in the field. If these technologies prove valuable, deploy them more widely.
- 56. Use information from research to implement other braking-related countermeasures.
- 57. Provide additional training and education on proper braking and panic-braking techniques.

C. Vehicle modification

- 58. Study the role of modifications in current motorcycle crashes.
- 59. Educate users about how modifications and loads can change the operating characteristics of their motorcycles.

D. Conspicuity

- 60. Conduct research to determine why other motorists fail to see and identify motorcyclists and implement countermeasures.
- 61. Encourage motorcyclists to enhance their conspicuity.
- 62. Encourage manufacturers to make motorcycle apparel and parts conspicuous.
- 63. Reconsider state requirements that prohibit safe conspicuity-enhancing modifications, including safe modification to lighting systems.
- 64. Conduct research on the effect of automobile DRL on motorcycle safety.

E. Lane use

- 65. Study the safety implications of lane splitting.
- 66. Educate motorcyclists about lane-use strategies, including HOV lane usage.

Environmental factors

A. Roadway characteristics

- 67. Identify and prioritize roadway hazards to motorcycle operation.
- 68. Develop and revise highway standards on all levels – federal, state, county, and local – to reflect the needs of motorcyclists and encourage motorcycle-friendly design, construction, and maintenance procedures.
- 69. Create a working group to recommend changes to highway standards to increase motorcycle safety.
- 70. Post specific warnings for motorcyclists where unavoidable hazards exist.

- 71. Revise the Manual on Uniform Traffic Control Devices (MUTCD) so that signage better communicates roadway or construction conditions that present hazards to motorcyclists.
- 72. Educate motorcyclists about the hazards created by common roadway defects and maintenance methods. Emphasize riding skills required to negotiate these hazards through education and training.
- 73. Take steps to remove slippery sealants and repair substances applied to road surfaces.
- 74. Educate road design and maintenance personnel about conditions that pose hazards to motorcyclists.
- 75. Reduce roadway debris such as that resulting from uncovered loads and shorn retreads.

B. Other vehicle design

- 76. Educate motorcyclists about strategies to overcome the challenges that the designs of other vehicles create in the traffic environment.
- 77. Emphasize motorcycle safety issues as a consideration in the design of other vehicles.
- 78. Investigate how the designs of other vehicles affect motorcycle safety.

C. First response

- 79. Integrate a motorcyclist treatment component in emergency medical personnel training.
- 80. Integrate a motorcyclist treatment component in first-aid/bystander care training and encourage motorcyclists to obtain this training.
- 81. Identify opportunities to utilize the *EMS Agenda for the Future* to promote motorcycle safety.

D. Intelligent Transportation Systems

- 82. Include motorcycles in the design and deployment of Intelligent Transportation Systems.

Appendix B. NAMS Recommendations by principal audience and topic

A. States, communities, and rider groups

1. Alcohol and other drugs

- 28. Continue to discourage mixing alcohol and other drugs with motorcycling.
- 29. Educate law enforcement about unique alcohol-related behavior of motorcyclists.
- 30. Encourage partnerships with groups already involved in alcohol/substance abuse issues related to motor vehicle crashes, e.g., Mothers Against Drunk Driving (MADD), Students Against Destructive Decisions (SADD).

2. Protective equipment

- 31. Use effective strategies to increase the use of FMVSS 218 compliant helmets.
- 32. Educate motorcyclists about the value of protective apparel by providing an information source on related research and a forum for the exchange of information.
- 33. Find ways to more effectively communicate the benefits of helmet use and work toward making voluntary use of FMVSS 218 compliant helmets more widely accepted.
- 34. Use effective strategies to ensure that all helmets in use meet FMVSS 218.

3. Motorcycle operator training and education

- 6. Explore public service announcements, advertising in enthusiast and near-enthusiast media, and any other viable avenues for distributing safety information.
- 9. Expand motorcycle safety programs to accommodate all who need or seek training.
- 11. Merge rider education and training and licensing functions to form one-stop operations.
- 38. Remind motorcyclists that they may be overlooked and provide defensive strategies for overcoming this situation.
- 57. Provide additional training and education on proper braking and panic-braking techniques.
- 59. Educate users about how modifications and loads can change the operating characteristics of their motorcycles.
- 61. Encourage motorcyclists to enhance their conspicuity.
- 66. Educate motorcyclists about lane-use strategies, including HOV lane usage.
- 72. Educate motorcyclists about the hazards created by common roadway defects and maintenance methods. Emphasize riding skills required to negotiate these hazards through education and training.
- 76. Educate motorcyclists about strategies to overcome the challenges that the designs of other vehicles create in the traffic environment.

4. Licensing

- 11. Merge rider education and training and licensing functions to form one-stop operations.
- 16. Identify and remove barriers to obtaining a motorcycle endorsement.
- 17. Develop and implement programs to allow all state motorcycle safety programs to issue motorcycle endorsements immediately upon successful completion of rider training courses.
- 18. Enforce penalties for operating a motorcycle without a proper endorsement.

19. Encourage states and jurisdiction to provide motorcycle specific training to license examiners administering testing for motorcyclists.

5. Motorist education

37. Educate operators of other vehicles to be more conscious of the presence of motorcyclists.

39. Include questions regarding motorcyclists on driver's license tests and include information in driving manuals.

40. Include the completion of a motorcyclist awareness class in sanctions against motorists found guilty of violating a motorcyclist's right-of-way.

49. Appropriate sanctions should be applied to those found guilty of contributing to motorcycle crashes. The sanctions, such as mandatory attendance at a motorcycle awareness course, would be designed to expand knowledge of motorcycle issues.

6. Highway and environment

70. Post specific warnings for motorcyclists where unavoidable hazards exist.

73. Take steps to remove slippery sealants and repair substances applied to road surfaces.

74. Educate road design and maintenance personnel about conditions that pose hazards to motorcyclists.

75. Reduce roadway debris such as that resulting from uncovered loads and shorn retreads.

7. Management

12. Increase the number of states conducting Motorcycle Safety Program Assessments.

41. Adequate funding needs to be devoted to the development and implementation of motorist awareness issues.

45. Educate law enforcement and judicial officials about unique motorcycle safety issues and resources.

46. Encourage inclusion of law enforcement officials in Motorcycle Safety Program Assessments.

48. Include motorcycle crash investigation procedures in the basic course given to crash investigators.

50. Traffic safety organizations outside of the motorcycling community can better influence motorcycle safety issues by becoming more educated about motorcycle safety issues and adopt them where applicable.

51. Increase funding for motorcycle safety programs by elevating their importance to state highway safety offices.

52. Representatives of the motorcycle safety community should be integrated into the larger highway safety community to improve cooperative efforts.

63. Reconsider state requirements that prohibit safe conspicuity-enhancing modifications, including safe modification to lighting systems.

B. Federal

1. Research

1. Immediate action should be taken by government and industry to address the critical questions in motorcycle safety through comprehensive, in-depth studies as well as studies

focused on specific topics.

7. Study factors that affect and shape motorcyclists' attitudes and behavior and how they affect crash involvement.

10. Conduct uniform follow-up research into the effectiveness and impact of rider education and training.

13. Establish benchmarks for rider education and training effectiveness and program operation excellence.

14. Explore the effectiveness of on-street training.

15. Commission studies to ensure that licensing tests measure skills and behaviors required for crash avoidance.

20. Develop an enhanced motorcycle licensing model using appropriate GDL concepts and evaluate its effectiveness.

21. Conduct research to determine which rider crash avoidance skills are most important.

23. Evaluate effectiveness of rider education and training in developing crash avoidance skills.

24. Evaluate the need for motorcycle simulator skills training.

25. Examine technological approaches such as pre-crash warning and avoidance systems to enhance crash prevention.

26. Study how alcohol, drugs and other substances, including over-the-counter medications, can affect a motorcyclist's operating skills.

27. Study the alcohol, drug and other substance use patterns of motorcyclists.

36. Conduct research regarding protective apparel effectiveness, and consider development or adoption of existing standards, if research justifies.

58. Study the role of modifications in current motorcycle crashes.

60. Conduct research to determine why other motorists fail to see and identify motorcyclists and implement countermeasures.

64. Conduct research on the effect of automobile DRL on motorcycle safety.

65. Study the safety implications of lane splitting.

67. Identify and prioritize roadway hazards to motorcycle operation.

78. Investigate how the designs of other vehicles affect motorcycle safety.

2. Data

2. To better utilize data collected by law enforcement personnel, a uniform traffic crash report for police officers should be developed and deployed. A similar format should also be developed for emergency medical services reports. This will permit meaningful comparisons among jurisdictions. All concerned parties should share the resulting information.

47. Develop and implement standardized data gathering and reporting for motorcycle crashes.

3. Regulatory

35. Revise FMVSS 218.

71. Revise the Manual on Uniform Traffic Control Devices (MUTCD) so that signage better communicates roadway or construction conditions that present hazards to motorcyclists.

4. Programs

- 8. Using information about how motorcyclists form attitudes about safety issues, create programs that reduce dangerous behavior and reinforce safe behavior.
- 22. Develop countermeasures in training, license testing, and motorcycle technology to address any current crash avoidance deficiencies.

5. Information

- 4. Create a clearinghouse to distribute current, practical information about motorcycle safety based on recent research.
- 5. Develop research-based safety information that can be used easily by the consumer media and in rider education and training systems.

6. Management

- 3. Mechanisms for building academic and funding capacity for ongoing and future motorcycle safety research should be explored.
- 41. Adequate funding needs to be devoted to the development and implementation of motorist awareness issues.
- 69. Create a working group to recommend changes to highway standards to increase motorcycle safety.

7. Emphasize and promote motorcycle issues

- 50. Traffic safety organizations outside of the motorcycling community can better influence motorcycle safety issues by becoming more educated about motorcycle safety issues and adopt them where applicable.
- 68. Develop and revise highway standards on all levels – federal, state, county, and local – to reflect the needs of motorcyclists and encourage motorcycle-friendly design, construction, and maintenance procedures.
- 77. Emphasize motorcycle safety issues as a consideration in the design of other vehicles.
- 79. Integrate a motorcyclist treatment component in emergency medical personnel training.
- 80. Integrate a motorcyclist treatment component in first-aid/bystander care training and encourage motorcyclists to obtain this training.
- 81. Identify opportunities to utilize the *EMS Agenda for the Future* to promote motorcycle safety.
- 82. Include motorcycles in the design and deployment of Intelligent Transportation Systems.

C. Motorcycle manufacturers

- 53. Conduct research to determine how current motorcycle designs affect crash and injury causation.
- 54. Implement the use of available tire and wheel technology and explore technology, such as run-flat tires, to reduce frequency of loss-of-control crashes caused by puncture flats.
- 55. Study the effectiveness of linked and antilock braking in the field. If these technologies prove valuable, deploy them more widely.
- 56. Use information from research to implement other braking-related countermeasures.

62. Encourage manufacturers to make motorcycle apparel and parts conspicuous.

D. Insurance companies

42. Insurers should write policies that stipulate that coverage or certain portions of coverage are not valid if the owner permits an unlicensed or improperly licensed operator to use the motorcycle.

43. Collect, organize, analyze, and distribute motorcycle-specific loss data from insurers to better understand safety issues, and to educate riders and other motorists on motorcycling safety issues.

44. Develop guidelines for insurers to tie approved training, licensing, and safe-riding practices to premium reductions.

Appendix C. NAMS Implementation Guide Advisory Panel

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