increased weight, temperature, and fatigue of the rider. This commenter also criticized the DOT helmet tests for failure to ''probe all the effects of a helmet in an actual accident situation.''

The agencies agree with the commenters that education and training should form an important component of a comprehensive motorcycle safety program, and that penalties should be imposed for driving under the influence of alcohol and failing to obtain a motorcycle endorsement. The guideline currently accommodates these concerns. The agencies do not agree, however, that education and training should exist to the exclusion of laws requiring the use of helmets. The arguments raised by these commenters questioning the safety benefits attributable to helmets fail to properly distinguish between fatality rates and absolute numbers of fatalities. The apparently low fatality numbers cited by the commenters follow naturally from the fact that there are relatively few motorcycles on the road, and they travel relatively few miles. Motorcycles make up only 2 percent of all registered vehicles in the United States and account for only 0.5 percent of all vehicle miles traveled. (Notably, most of the States cited by the commenters fall within the bottom of the range with respect to numbers of motorcycles registered and miles traveled, so it is not surprising that their fatality statistics are even lower.) However, on the basis of vehicle miles traveled, motorcyclists are about 20 times more likely to die in a motor vehicle crash than are passenger car occupants. Moreover, though motorcyclists were involved in only 1 percent of all police-reported motor vehicle crashes in 1991, they accounted for 8 percent of all occupant fatalities and almost 7 percent of total traffic fatalities.

Riding a motorcycle is a very high risk form of transportation in the normal traffic environment, and it is even more risky without a helmet. NHTSA estimates that an unhelmeted motorcyclist is 40 percent more likely to incur a fatal head injury and 15 percent more likely to incur a non-fatal head injury than a helmeted motorcyclist when involved in a crash. The level of protection afforded by helmets is borne out by recent statistics in California, one year after implementation of a mandatory motorcycle helmet use law. Statewide fatilities decreased 37.5 percent from 523 fatalities in 1991 to 327 in 1992. An estimated 92 to 122 fatalities were prevented, and head injuries decreased significantly among both fatally-injured and non-fatally-injured motorcyclists.

The agencies do not agree with the comment that, because motorcyclists carry insurance, health care costs are not an issue for consideration. The data show that large numbers of motorcyclists either do not carry insurance or do not carry enough insurance to fully cover expenses. It is notable that the commenter stating this position also cited statistics showing that many riders involved in motorcycle fatalities did not have a motorcycle license. (It is reasonable to assume that these unlicensed riders did not carry insurance.) More importantly, the societal costs have been documented. The General Accounting Office, in a 1991 report reviewing a broad array of published and unpublished effectiveness studies on helmets and helmet laws, highlighted the societal costs, stating that:

> The studies we evaluated showed that nonhelmeted riders were more extensive users of medical services and long-term care, and were more likely to die or lose earning capacity through disability. In one sense, the care of accident victims represents a claim on society's resources regardless of how payment is made. The studies we evaluated also indicated, however, that much of the actual payment for care is made by society through tax-supported programs or insurance premiums.

The agencies do not accept the premise that helmeted riders may be involved in more accidents than non-helmeted riders due to helmet-related factors, such as interference with vision or hearing. Studies confirm that wearing helmets does not restrict the ability to hear horn signals or the likelihood of visually detecting a vehicle in an adjacent lane prior to initiating a lane change. The relatively higher involvement of helmeted riders in crashes, as compared to non-helmeted riders, follows naturally from the fact that, nationwide, more motorcycle riders wear helmets than do not. Indeed, if 100 percent of motorcycle riders wore helmets, 100 percent of the observed fatalities would consist of helmeted victims. The agencies agree with the commenter that the DOT helmet test cannot replicate all aspects of an actual crash situation, but do not accept the conclusion that the test has no value. Among other parameters, the test measures impact attenuation, helmet retention, and resistance to penetration. These parameters are important determinants of the level of crash protection afforded by a helmet.

In contrast to the comments of these four individuals, the majority of commenters generally supported the guideline. Four commenters specifically identified the use of helmets as an important component of the guideline. Advocates recommended that the guideline urge the enactment of motorcycle helmet use laws more directly, rather than parenthetically. The National Association of Governors' Highway Safety Representatives (NAGHSR) thought that more emphasis should be placed on mandatory helmet use laws, because it viewed helmets as the most effective means of reducing motorcycle head injuries. The Minnesota Department of Transportation urged continued emphasis on the importance of wearing motorcycle helmets. 3M Corporation supported mandatory helmet laws from the standpoint of conspicuity, recommending that helmets be made conspicuous for both daytime and nighttime visibility. The agencies agree with all of these comments about the importance of wearing motorcycle helmets. In particular, the agencies agree with Advocates that motorcycle helmet use laws deserve more than parenthetical reference, and have included additional language in the Program Management section. We have also added, under the section on equipment, language clarifying that helmets should meet the Federal Motor Vehicle safety Standard on helmets. The agencies agree with 3M that daytime and nighttime conspicuity of helmets would add to motorcyclist safety, and have included appropriate language in the Conspicuity section of the guideline.

Several commenters made recommendations concerning training, education, or licensing issues. Minnesota stressed the need for emphasis on improving the knowledge and skills of operators. Advocates noted that, even with school certification, adolescent motorcycle operators suffered a disproportionate number of fatalities. Consequently, Advocates believed that the guideline should not encourage newly licensed and younger drivers to seek motorcycle license endorsement. Instead, Advocates believed that training should be limited to those with motorcycle licenses, and should not be conducted in schools, youth groups, or the like, where it might serve to encourage motorcycle riding by the young.

The Hawaii DOT recommended the deletion of the entire Rider Education and Training section, reasoning that ''government should not care *how* a rider is educated, only *that* he is educated,'' and concluding that motorcycle riding criteria should be performance oriented (i.e., government should set criteria for the licensing test, but not for the training). Citing NHTSA's five-year study of driver