

## FINAL REPORT

REPEAL AND MODIFICATION OF MANDATORY  
MOTORCYCLE HELMET LEGISLATION

- A Review of Available Information -

by

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In 1975, Congress relieved the Secretary of Transportation of the power to impose sanctions upon states for not having a law requiring the use of helmets by motorcyclists. Shortly afterward, the states having such laws began repealing or modifying them. This report reviews the available literature on the subject of mandatory motorcycle helmet legislation, and presents the results of a survey of states that have repealed their laws.

From the information available, it was determined that the use of motorcycle helmets reduces the incidence of serious and fatal head injury among motorcyclists without interfering with their ability to operate their vehicles safely. Additionally, it was determined that the mandatory motorcycle helmet laws are constitutional and that they have the support of both the general public and motorcyclists in Virginia.



## SUMMARY OF FINDINGS

Over 60 scientific studies concerning mandatory motorcycle helmet usage published by research organizations or in journals were reviewed. The findings are as follows:

1. The use of motorcycle helmets is an effective method for reducing the incidence of serious injuries, particularly head injuries, and fatalities. Helmet usage does not cause increased neck injuries in accidents, does not handicap the rider auditorily or visually, does not encourage risk-taking, and does not cause discomfort which would result in increased accidents.
2. The courts have concluded in over 25 cases that the motorcycle helmet laws are constitutional. These laws do not constitute denial of due process or equal protection, nor do they violate the first amendment right of personal expression. The laws protect the public interest in that there is more than a reasonable relationship between helmet usage and the public health, welfare, and safety.
3. In states that have conducted public opinion polls, a majority of motorcyclists and the general public have been found to favor some form of helmet law. In Virginia, 81% of all motorcyclists and 92% of the general public favor the current mandatory helmet legislation.
4. In spite of the evidence that the helmet laws reduce injuries and fatalities, that they are generally held to be constitutional, and that they have public support, nine states have repealed their laws and 14 have modified them to apply to a particular age group. Safety personnel in the states that have repealed their helmet laws attribute the repeal to the impact of the lobbies against them.
5. Very little data are available for judging the impact of the repeal of the laws. Rhode Island repealed its law in 1975, and since then motorcycle fatalities per year have doubled and the

severity of motorcycle crashes has increased. Connecticut repealed its law in 1976 and has experienced both twice as many head injuries as before repeal and five times as many head injuries among nonhelmet users. It is possible that repeal of the law in Virginia could result in similar outcomes.

6. Since most motorcyclists involved in accidents are over 20 years old — usually between 20 and 30 — modifying legislation to apply only to persons 18 years old and under leaves the majority of crash victims unprotected in terms of head injuries. While this option retains protection for some portion of motorcycle riders, it is not a viable solution.

## CONCLUSION AND RECOMMENDATION

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It is concluded from the evidence presented in this report that the passage and enforcement of the Virginia laws requiring the use of helmets by motorcyclists have increased public safety with a minimum of public restriction. It is recommended that the Virginia General Assembly not repeal or modify the current statutes on mandatory helmet use.



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## INTRODUCTION

Motorcycle accidents have long been considered to represent one of the most serious and certainly one of the most pressing highway safety problems in this country. Motorcycle registrations have been increasing nationwide due to the convenience and economy of motorcycle operation; however, alarming increases in fatalities from motorcycle crashes have accompanied this trend of increasing ridership.<sup>(1)</sup> Motorcycle accidents are of particular concern because of the severity of their consequences. "Once a motorcycle accident occurs, there is a high probability that a serious injury or fatality will occur,"<sup>(2)</sup> in that 50% of all single vehicle and 80% of all multivehicle crashes result in such injuries and deaths.<sup>(3)</sup> Over 70% of all motorcyclists involved in crashes experience some permanent restriction of activity; 40% undergo enforced inactivity lasting between 29 and 175 days. Over 55% are admitted to hospital emergency rooms and 43% are hospitalized.<sup>(4)</sup> The severity of motorcycle crashes has prompted researchers to examine the characteristics and types of injuries involved in motorcycle accidents and to search for countermeasures to prevent these injuries.

It has long been recognized that head injuries, while not always the most common type of injury in motorcycle crashes, are usually the most severe. Head injuries are estimated to be involved in between 50% and 75% of all fatalities from motorcycle crashes<sup>(3,4,5,6,7,8,9,10,11)</sup> and in between 15% and 75% of all such crashes.<sup>(4,5,7,12,13,14,15,16,17,18)</sup> Even in studies substantiating that nonfatal head injuries are twice as common as fatal ones, it has been demonstrated that such nonfatal injuries are more serious than injuries to other regions of the anatomy and that they often lead to "crippling, paraplegia, and permanent, disabling brain damage."<sup>(13,19,20)</sup>

It is easy to see why head injuries in motorcycle crashes are common and severe when one examines the sources of such injuries. In clinical studies of motorcycle/car collisions it has been found that head injuries result from:

1. Frontal, temporal, and occipital head impact on the hood of the automobile;
2. occipital or vertex impact on the windshield or windshield/roof junction;
3. frontal impact on the ground; and
4. tangential impact or skidding.<sup>(21)</sup>

Additionally, it has been found that multiple head impacts are extremely common,<sup>(16,21,22)</sup> and that the forces exerted on the head during these collisions can exceed 100 g's.<sup>(21)</sup> While the above sources of injury apply only to collisions, it has been found that head injuries resulting from noncollision, off the road accidents are even more serious,<sup>(23)</sup> and often involve fixed objects such as signposts and lamp standards.

Motorcycle head injuries resulting from the above mentioned sources can be classified into two groups: (1) localized trauma, such as skull fracture or depression of the brain, and (2) major acceleration injury to the brain, such as a concussion. Due to the severity of motorcycle head injuries, researchers began looking for countermeasures which would alleviate both of these very different types of injury. Dr. William Haddon of the Insurance Institute for Highway Safety proposed a solution in his paper "Energy Damage and the Ten Countermeasure Strategies." He suggested that the rider "Interpose a material barrier between the mechanical energy transmitted [in the crash] and the susceptible structure."<sup>(24)</sup> The motorcycle crash helmet, as a material barrier, would absorb the energy or impact from the crash and thus protect the rider's head. This solution had been proposed years earlier in 1943, and had been voluntarily used to protect individuals from head injury for centuries — from dangers incurred in wartime and from occupational hazards incurred by many diverse professions, from construction worker to football player. The idea of mandating helmet usage for motorcyclists, however, was a much more recent innovation.

On September 9, 1966, the Highway Safety Act of 1966 was signed. It directed each state to develop a program of countermeasures to reduce traffic accidents and fatalities in accordance with standards to be set by the Secretary of Transportation

(then the Secretary of Commerce). As a direct result of this Act, on July 10, 1967, the Secretary promulgated the safety standards to be applied to the state programs, including Highway Safety Standard #3, which provided in part that "each motorcycle operator wears an approved safety helmet and eye protection when he is operating his vehicle on streets and highways and ... each motorcycle passenger wears an approved safety helmet."<sup>(25)</sup> Within seven years, 47 states plus the District of Columbia and Puerto Rico had passed legislation pertaining to the use of helmets. For the most part, the state laws required compliance with the federal standards. California was the only state not to pass such a law, while Utah's legislation applied only to motorcyclists operating their vehicles in excess of 35 mph. Illinois originally passed an acceptable law only to have it declared unconstitutional by its State Supreme Court in 1969.<sup>(26)</sup> Illinois is the only state to take such action.

Since these three states were not in compliance with federal standards, the Secretary of Transportation gave public notice on July 13, 1975, of his intention to impose a sanction upon the states in question. "The basis for the proposed action was the failure of the states to enact a constitutionally acceptable helmet law for motorcycle drivers and passengers as required by Highway Safety Program Standard #3".<sup>(25)</sup> The sanction to be imposed would have involved the loss of all Highway Safety funds plus the loss of 10% of each state's federal aid highway funds. Congress, in an attempt to prohibit the imposition of this harsh sanction, amended the Highway Safety Act in 1976, as follows:

A highway safety program approved by the Secretary shall not include any requirement that a state implement such a program by adopting or enforcing any law, rule, or regulation based on a standard promulgated by the Secretary under this section requiring any motorcycle operator 18 years of age or older or passenger 18 years of age or older to wear a safety helmet when operating or riding a motorcycle on the streets and highways of that state. (P. L. 94-280, May 5, 1976)

While this amendment essentially took the teeth out of the helmet law standard, it apparently was not Congress's intention that the states would repeal their helmet laws.<sup>(25)</sup> In fact, since it had been demonstrated time and time again that the use of motorcycle

helmets prevented serious head injuries and fatalities and that the helmet laws were constitutional, Congress assumed that the states would leave the helmet laws intact. However, at the time of this writing, 9 states have completely repealed their helmet laws (making a total of 10 states with no helmet requirements) and 14 others have modified their helmet laws to apply only to specific age groups, usually those persons under 18 years of age (see Table 1). In 4 states, the legislation repealing the helmet laws were vetoed by the governor, with this veto being overridden in only one case.

Table 1

## Status of the Mandatory Motorcycle Helmet Laws

States With No Requirements		States Requiring Usage Only Among Riders Under 18 Years	
State	Date Repealed	State	Date Modified
California <sup>(a)</sup>	-	Arizona	5/76
Nebraska <sup>(b)</sup>	1975	Oklahoma	5/76
Illinois <sup>(c)</sup>	1969	Alaska <sup>(d)</sup>	7/76
		Kansas <sup>(e)</sup>	7/76
Rhode Island	5/75	Louisiana	10/76
Connecticut	6/76	Utah	2/77
Iowa	7/76	Minnesota	4/77
Colorado	5/77	Hawaii	6/77
Washington	9/77	New Mexico	6/77
Oregon	10/77	Indiana	7/77
Maine	10/77	Montana	7/77
		North Dakota	7/77
		South Dakota	7/77
		New Hampshire	3/77

States Where Legislative Repeal Vetoed<sup>(f)</sup>

Maine<sup>(g)</sup>  
Nevada  
Texas  
South Carolina

- (a) California never passed a law.  
 (b) Declared unconstitutional by State Supreme Court.  
 (c) Declared unconstitutional by State Supreme Court.  
 (d) Repealed for persons with a Class B motorcycle license and over 19 years old. All passengers required to wear helmets.  
 (e) Repealed for persons 16 and over.  
 (f) From reference 27.  
 (g) Veto overridden.

## PURPOSE

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The purpose of this report is to review the major issues relating to the helmet law question in developing answers to the following questions.

1. Are motorcycle helmets (and helmet legislation) effective in reducing serious head injury and saving lives?
2. Are the helmet laws constitutional?
3. Why are states repealing their mandatory helmet laws in direct contradiction of the available evidence?
4. What are the possible consequences of repealing or otherwise modifying the helmet laws?

### ARE MOTORCYCLE HELMETS AND HELMET LAWS EFFECTIVE?

In order to determine the efficacy of motorcycle helmet laws, over 60 reports or papers from scientific journals and research organizations were reviewed, including many documents presenting findings from original research. Summary data on the original research studies are given in Table 2. It is clear from the literature on these studies that the use of motorcycle helmets reduced serious and fatal head injury.

As early as 1943, it was recognized that helmet wearers were less likely to incur injuries than nonwearers, and that the risk of being killed in a motorcycle crash was significantly reduced by helmet usage.(22,28,29) Later research corroborated these findings and found that nonwearers were from 50% to 400% more likely to incur head injuries than wearers. For further information see references 6, 8, 9, 13, 30, 31, 32, 33, 34, 35, and 36. Head injuries incurred were more severe for non-wearers.(9,13,30,32) The consensus of opinion among medical and epidemiological researchers endorsed the motorcycle helmet as an efficient life saving device.(37,38)

Determining whether the motorcycle helmet laws have been effective is somewhat more difficult. Enactment of the helmet law results in an increase in helmet usage, shown in Table 3. In those areas where helmet laws have been passed, usage has increased 26% to 80%.(8,12,29) Additionally, differences in

Table 2

Original Research on the Effectiveness  
of Motorcycle Helmets and Helmet Laws

<u>Date</u>	<u>Authors</u>	<u>Location</u>	<u>Findings</u>
1943	Cairns	Great Britain	(1) Hospital treated motorcycle injuries of all types were reduced 50% after legislation. (2) Skull fractures were reduced 25%.
1957	Chandler and Thompson	Great Britain	(1) Helmet wearers were 30%-40% less likely to incur head injury than nonwearers.
1964	Foldvary and Lane	Victoria	(1) The risk of being killed in a motorcycle crash is 40% less for helmet wearers than for non-wearers. (2) The risk of injury is about 70% less for helmet wearers. (3) Fatality rates decreased more for Victoria (which instituted legislation) than for the rest of Australia during the same period.
1967	Crancer	Washington State	(1) There was a decrease in motorcycle head injuries after legislation.
1967	Allsop	Great Britain	(1) An increase in helmet usage from 70% to 100% would result in a 20% reduction in fatalities and a 3.7% reduction in serious injuries.
1969	New York DMV	New York State	(1) 40% reduction in motorcycle fatalities after legislation. (2) 33% reduction in severe to fatal motorcycle injuries to the head, face, and neck.
1970	U.S. Dept. of Trans.	46-51 States (depending on the year)	(1) States with motorcycle helmet laws showed a greater decrease in the fatal crash rate (fatalities/10,000 registrations) than states without such laws.

Table 2 (Cont.)

<u>Date</u>	<u>Authors</u>	<u>Location</u>	<u>Findings</u>
1971	Traffic Accidents Study Committee	Japan	(1) Nonwearers were twice as likely to incur a head injury than helmet wearers. (2) Head injuries were less severe for helmet wearers.
1973	Jamieson and Kelly	Brisbane	(1) Both major head injuries and all head injuries were reduced significantly after legislation, while other injury types increased.
1973	Scalone	Selected States (National Safety Council Data)	(1) Prior to legislation, 75% of all motorcycle fatalities involved head injury. After legislation, only 45.9% of the fatalities involved head injuries.
1973	Nakamura	Tokyo	(1) Nonwearers experienced more and more serious injuries than helmet wearers.
1973	Hight	Southern Calif.	(1) Nonwearers were 4 times more likely to sustain a severe to fatal injury. (2) Persons wearing helmets sustained lower injury levels than nonwearers.
1974	Richardson	Michigan and Illinois	(1) 63% reduction in serious to fatal head injury in Michigan after legislation. (2) 54% reduction in all types of head injury in Illinois. (3) Nonwearers were three times as likely to incur a serious to fatal head injury as helmet wearers, and twice as likely to incur any head injury.
1975	Singh et al.	New Zealand	(1) Motorcycle fatalities were 40% lower after legislation than would have been expected based on previous trends. (2) Helmet wearers were less likely to incur a fatal injury than nonwearers.

Table 2 (Cont.)

<u>Date</u>	<u>Authors</u>	<u>Location</u>	<u>Findings</u>
1975	Robertson	Matched States	(1) Effects of the helmet laws in reducing fatalities were significant; i.e., fatality rates (fatalities/registrations) in states initiating helmet laws decreased significantly more than rates for states without such laws over the same time period.
1975	Siegel	Calif. and the South-west	(1) Nonwearers were four times more likely to incur a serious to fatal head injury than wearers.
1976	Newman	Ottawa Vanier Nepean Gloucester	(1) A lower percentage of helmet wearers incurred a head injury than did nonwearers. (2) Head injuries among helmet wearers were less severe (mostly minor contusions) than those for nonwearers.
1977	Keleher	Arizona	(1) Nonwearers were 2.5 times as likely to incur a head injury as helmet wearers. (2) Nonwearers were 1.5 times as likely to incur a concussion or skull fracture as helmet wearers.
1977	Waddington and Winston	New Jersey	(1) The fatality rate (per licensed driver) decreased after legislation. (2) New Jersey experienced a 28% decrease in fatalities and a 40% decrease in injuries, along with a 24% decrease in head injuries. (3) Nonwearers were 1.5 times more likely to be killed in a motorcycle crash than helmet wearers.

Table 3

Estimates of Motorcycle Helmet Usage Before and After  
Enactment of Mandatory Legislation, and With and Without  
Such Legislation

<u>Location</u>	<u>Before Legislation</u>	<u>After Legislation</u>
Victoria	56%	100%
Brisbane	16.6%	96%
New Zealand	73.2%	96.6%
	<u>Without Legislation (Voluntary Usage)</u>	<u>With Legislation</u>
Ontario	-	98.7%
Japan	-	70.0%
Georgia	-	99.8%
Maryland	-	100.0%
California	60.7%	-
Illinois	36.8%	-
Utah	65%	94%
	(Voluntary use under 35 mph)	(Mandatory Use over 35 mph)

rates of usage between states with and states without helmet laws are significant. (31,39,40,41,42,43) Several states have experienced decreases in head injuries after the passage of motorcycle helmet legislation, (10,15,28,29,33,37,38) and states with helmet laws have experienced a greater decrease in the fatal motorcycle crash rate and in serious to fatal head injuries than matched states without such laws. (31,39,44) While there are many problems in these "matched states" studies, their results provide an indication of the positive effect the helmet laws have had on the motorcycle safety environment.

The finding that accidents were less severe following passage of the helmet laws also applies to Virginia. An analysis of the effects of the helmet laws upon accident severity over time was conducted using the total accident/fatal accident ratio as the measure of the seriousness of accidents. This ratio was calculated for the years 1961 through 1976 and the results appear in Table 4. It should be remembered in examining this table that the *larger* the total accident/fatal accident ratio, the *less severe* the motorcycle accident environment was during that year.

Table 4

## Virginia Motorcycle Accident Information

<u>Year</u>	<u>Total Number of Accidents</u>	<u>Number of Fatal Accidents</u>	<u>Accident/Fatal Ratio</u>
1961	344	8	43.00
1962	311	8	38.88
1963	345	5	69.00
1964	437	11	39.73
1965	964	18	53.56
1966	1,421	23	61.78
1967	1,471	48	30.65
1968	1,486	36	41.28
1969	1,321	23	57.43
↑ Before Law			
1970	1,585	27	58.70
↓ After Law			
1971	2,044	36	56.78
1972	2,559	57	44.89
1973	3,342	58	57.62
1974	3,518	62	56.74
1975	2,807	56	50.13
1976	2,895	65	44.54
Before Law Mean	—	48.37	
After Law Mean	—	51.78	
t-Value		.698	
Significance	p <	.001	

Source: Virginia Crash Facts, Virginia Department of State Police, 1961-1976.

Since the data are based on a time series, an analysis was first performed to detect any trends which should be considered in the final analysis. One of the major contentions of the anti-helmet laws groups has been that the severity of accidents was decreasing even before enactment of the laws, so that documented decreases in severity after passage were due to this historically decreasing trend and not to the effects of increased helmet usage. However, no preexisting trends, either increasing or decreasing, were noted in this analysis. Once the absence of trends was determined, the data were analyzed by simply comparing the severity of motorcycle accidents before passage of the laws with the severity afterwards. The before period was designated as 1961 to 1969 and the post period as 1971 to 1975 (1970 is not included in either period, since the helmet law was not enforced for the whole year). The mean severity ratio before passage of the helmet laws was 48.4. Following enactment of mandatory helmet legislation, the mean severity ratio was 51.8, which indicates that motorcycle accidents were less severe following enactment of the laws than before. This decrease in severity was significant at the .001 level, which means that only one time in 1,000 could a difference this great occur by chance alone.

The answer, then, to the question of whether the helmet laws and motorcycle helmets themselves are effective life saving countermeasures is yes. This finding was confirmed in all of the scientific studies reviewed, in the accident data for other states, and in the accident data for Virginia.

Apart from the questions of their effectiveness, the motorcycle helmet laws have been attacked on the grounds that they represent a safety hazard. These arguments against the helmet laws have been examined and the literature searched to determine their validity. The arguments themselves and the research concerning them are presented below.\*

Argument #1: Motorcycle Helmets, While Reducing Head Injuries Incurred in Crashes, Increase the Incidence of Neck Injuries

This argument stems from a study done in New York in 1969 in which neck injuries increased from 4 the year preceding the enactment of helmet legislation to 14 the year after.<sup>(15)</sup> (Fatalities decreased significantly during the same period.) This

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\*For a more detailed explanation of these arguments, the reader is referred to the proceedings of an American Medical Association Panel entitled "Head Protection for the Cyclist." (Reference #19.)

is the only study to record an increase in neck injuries after passage of helmet legislation. As demonstrated in most studies, the incidence of neck injury is so rare that it usually does not exceed 6% of total injuries, and is usually less than 2%. (4,5,6,16,44,45,46,47) Since the number of neck injuries mentioned in the New York study is in keeping with the small numbers mentioned in other studies, it is very difficult to draw conclusions concerning changes over time. Statistically, small numbers of anything are expected to fluctuate over time just as a matter of chance happening. This is particularly true in the case of accidents and crash related injuries, which are relatively rare events in the general population. It is certainly possible that the increase in neck injuries experienced in New York could have been attributable to chance factors, and in light of the fact that no other research has found such an increase, the change is probably a chance fluctuation.

There are other problems with the New York study. For instance, it was unknown whether a helmet was worn at the time any of the neck injuries occurred. Thus, it is impossible to attribute the increase in neck injuries to helmet usage, since it's possible that helmets were not worn. (40) Additionally, it is possible that passage of the motorcycle helmet laws and the study of their effect drew attention to head and neck injuries, and thus more neck injuries were found. Finally, since more deaths from motorcycle accidents are more often the result of multiple trauma than of a single injury, (4) it is difficult to determine the role these neck injuries played in the fatal accidents discussed.

It can be concluded from this review of pertinent studies that neck injuries are rare in relation to motorcycle accidents, and that there is no evidence to support the argument that helmet usage increases the probability of neck injury. As concluded by a panel of experts assembled by the American Medical Association, "Based on the evidence, the likelihood of neck injury caused by the helmets is almost impossible." (19)

Argument #2: Motorcycle Helmets Reduce the Cyclists'  
Peripheral Vision and Thereby  
Create a Safety Hazard

The validity of argument #2 has recently been studied in detail and it has been determined that "with regard to restriction of the total field of view in the horizontal plane, it can be concluded that full coverage helmets [the most common type in use] provide only minor restrictions, less than 3 percent from that of

an unhelmeted person."<sup>(48)</sup> As mentioned above, the full coverage helmet, representing 95% of those now in use, is the most common type. Additionally, it has been determined that most motorcycle accidents occur within 40° of direct front of the cyclist and that most experienced cyclists periodically look from side to side to compensate for the 3% loss. Finally, even with a full coverage helmet, the field of view is still greater than 200°.<sup>(48)</sup> The most strict state standard on peripheral vision necessary in the operation of a motor vehicle is 140°.<sup>(19)</sup> Thus, it can be concluded that helmet usage results in only a nominal decrease in peripheral vision and that this decrease does not affect the driver's ability to operate his vehicle safely.<sup>(48)</sup>

Argument #3: Motorcycle Helmets Significantly Reduce the Cyclists' Ability to Hear Other Vehicles in Traffic, Thus Creating a Safety Hazard

The assertion made in argument #3 has been studied in detail and it has been determined that the ability to hear warnings in traffic is reduced more by rolling up the windows in an automobile than by wearing a motorcycle helmet. This reduction in hearing ability is essentially the same as that experienced by the average 46-to 55-year-old person in this country through aging alone.<sup>(49)</sup>

In addition, scientific studies conducted under conditions similar to those encountered in street riding have found that

A given sound will be heard by a cyclist if it is loud enough when it reaches his ear to be above his hearing threshold, and if it is not "masked" or hidden by other sounds or noise present at the same time. Motorcycles create high levels of noise. For a rider to hear any other sound in the presence of this high noise level, the sound must be as loud or louder than that emitted by the motorcycle itself. Helmets reduce the loudness of both the sound of interest and the motorcycle noise by an equal amount, and therefore, do not alter the signal-to-noise ratio between the two sounds. Consequently, as long as the rider can hear the motorcycle itself while wearing a helmet, he or she can also hear any other sound with a favorable signal-to-noise ratio at least as well as a driver who does not wear a helmet.<sup>(50)</sup>

It also has been found that helmet usage reduces the possibility of hearing damage due to wind and traffic noise, and that usage actually makes it easier for the rider to distinguish warning signals from other traffic noises because the signal-to-noise ratio discussed above may be more favorable with helmet usage than without.(51)

Thus, it can be concluded that helmet usage does not impair the motorcyclist's ability to operate his vehicle in a safe manner.

Argument #4: Helmet Use Creates a Sense of Overconfidence Which Causes the Motorcycle Operator to Take More Risks

There is no evidence to indicate that helmet wearers differ from nonwearers in relation to risk taking.(19) From the Multi-disciplinary Accident Investigation in California, it has been determined that the most common cause of motorcycle crashes is not overconfidence or risk taking on the part of the cyclist, but the violation of the motorcyclist's right-of-way by another vehicle and the cyclist's subsequent inability to make evasive maneuvers quickly enough.(52) Additionally, there is evidence to indicate that cyclists who wear helmets when not required to are safer drivers than those who do not wear helmets. Thus, it is possible that helmet users would exhibit less risk taking behavior than would nonusers.(19)

Argument #5: Motorcycle Helmets Tend to Overheat During Warm Weather and This Discomfort Increases the Potential for Accidents

There is no documentation of a relationship between warm weather discomfort and accident potential. However, along the same line, it could also be argued that helmets keep the head warm during cold weather and that they keep the head dry in inclement weather, since helmet usage in states where such use is voluntary increases as much as 10% when it rains.(41)

Argument #6: The weight of the Motorcycle Helmet Increases Rider Fatigue and Thus Causes Accidents

There is no evidence to support this argument, especially in light of the fact that the center of gravity of his helmet has much to do with a driver's perception of the weight of the helmet as the weight itself.(19)

Argument #7: Improper Removal of the Helmet by Emergency Personnel After an Accident Can Exacerbate Injury

There is a possibility that improper removal of the helmet could aggravate an injury. However, since the American College of Surgeons has recently revised its Emergency Training manual to include a section on proper helmet removal, improper helmet removal should cease to be a potential source of problems.<sup>(19)</sup>

In summary, from an examination of the literature it has been shown that motorcycle helmets are effective in reducing injuries and fatalities, that they do not place the rider under additional risk of neck or other injuries, and that they do not impair the driver's visual or auditory sensory capabilities. It can be concluded, then, that "Motorcycle helmet use laws represent social policy that has been effective in achieving the purpose of reducing fatal injury."<sup>(40)</sup>

ARE THE MOTORCYCLE HELMET LAWS CONSTITUTIONAL?

The constitutionality of motorcycle helmet legislation has been challenged unsuccessfully in the appellate courts of 35 states and in the courts of last resort in 27 states. The issue has been introduced in the United States Supreme Court five times.<sup>(53)</sup> A partial listing of these cases, complete through December of 1976, appears in Appendix A. In the Supreme Court rulings, the court affirmed one lower court ruling without opinion, denied three petitions for certiorari in cases upholding headgear legislation, and dismissed an appeal in one case "for want of a substantial federal question."<sup>(54)</sup> As mentioned earlier, only one challenge to the constitutionality of helmet legislation has been successful. In 1969, the state court of last resort in Illinois declared its helmet law unconstitutional. People v. Fries, 42 Ill. 2d 446, 250 N.E. 2d 149 (1969).

The constitutionality of legislation is generally judged against two standards. A law may be constitutionally exercised, even if it restricts personal freedom, if it meets the following two criteria:

- (1) "The public interest, not the interests of a particular person or group, requires the interference with individual rights," and
- (2) "The means of carrying out the public interest are both reasonably necessary to accomplish it and are not unduly oppressive upon individuals."<sup>(53)</sup>

The purpose of this section of the report is to review the rulings of the various courts in relation to these criteria and to reflect their consensus in relation to the mandatory motorcycle helmet laws. This purpose will be accomplished by presenting the major arguments to challenging the constitutionality of the legislation and reviewing the rulings in relation to each argument, including (1) lack of public purpose, (2) restriction of personal expression, (3) denial of equal protection, (4) denial of due process through illegal delegation of powers, and (5) vagueness in the statutes. (It should be noted that many of these arguments are interrelated and should be expected to overlap somewhat.)

Argument #1: The Use of a Motorcycle Helmet Does Not Prevent Crashes from Occurring: Rather, the Helmet is Designed Solely for the Protection of the Motorcyclist. Since the Cyclist is the Only Party Who Stands to Suffer as a Result of the Accident, it Should Be Up to the Cyclist to Decide If He or She Wants This Protection

This argument can be summed up through a statement made in the only State Supreme Court decision still standing which declares a state's motorcycle helmet law unconstitutional. "The manifest function of the headgear requirements in issue is to safeguard the person wearing — whether it is the operator or the passenger — from the injuries. Such a laudable purpose, however, cannot justify the regulation of what is essentially a matter of personal safety." People v. Fries, 42 Ill. 2d 446, 450, 250 N.E. 2d 149, 151 (1969). Similarly, the plaintiff in the case of Simon vs. Sargent argued that "police power does not extend to overcoming the right of an individual to incur risks that involve only himself." 346 F. Supp. 278 (D.C. Mass. 1972), aff'd 409 U. S. 1020, 93S.Ct. 463, 34 L. Ed. 2d 312.

However, the court in question ruled that "the public does have an interest if public resources are directly involved in these risks." Ed. at 279. The public resources involved in motorcycle accidents were well established by the District Court's initial ruling in the above mentioned case:

From the moment of the injury, society picks the person up off the highways; delivers him to a municipal hospital and municipal doctors; provides him with unemployment compensation if, after recovery, he cannot replace his lost job, and, if the injury causes permanent disability, may assume responsibility for his family's subsistence. Ed. at 279.

Other costs may also accrue to society as a result of motorcycle accidents. Insurance rates may rise. People v. Bennett, 391 N.Y.S. 2d 506, Colonie Justice Ct. (1977). Also, rates for medical insurance could rise. (However, it has been shown that the group most often in serious motorcycle accidents, those 20-25 years old, are also those least likely to have health insurance.<sup>(17)</sup> In these cases, the cost of medical attention would revert back to the victim's family or to the state.) There is also the ultimate loss to society of the contribution the accident victim would have made had the crash not occurred. Commonwealth v. Coffman, 453 S.W. 2d 759, Ky (1970). Thus, it is all too true that "when the individual health, safety and welfare are sacrificed or neglected, the state must suffer." 169 U. S. 366, 397 (1897). In the case of motorcycle helmets, the state does have sufficient public resources invested in its citizenry's welfare to mandate helmet usage.\*

There are, however, other flaws in the logic of this argument. Motorcycle helmets are not designed solely for the protection of the cyclist. They can, in rare instances, prevent crashes from occurring. Occasionally, a cyclist is struck by roadway debris such as gravel or loose pavement, or is temporarily blinded by roadway dust.<sup>(26,55)</sup> Helmet usage could prove instrumental in preventing accidents resulting from these situations. State v. Babbs, Martin City Ct., Fla. (1968). Also, while the motorcyclist is the party most likely to be injured when he is involved in a collision, he is not the only one to suffer some loss. Often some property damage is sustained by the owner of the other vehicle and there is a possibility of other damages resulting from the postcrash actions taken by the driver of the other vehicle. "Anything that might cause a driver to lose control may well tragically affect another driver. If the loss of cyclist control occurs on a crowded freeway with its fast moving traffic, the veering of a cyclist from his path of travel may pile up a dozen vehicles." Bisenius v. Karns, 42 Wisc. 2d 42, 48, 165 N.W. 2d 377, 380, app. dismd. 395 U.S. 709, 39 S.Ct. 2033, 23 L.Ed. 2d 655 (1969).

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\*Several states have, in their rulings on motorcycle helmet legislation, chosen to distinguish this case from the general case involving enforced safety standards and behaviors, such as mandatory seat belt usage.

It can be concluded from these findings that there is sufficient public interest involved in the issue of motorcycle helmet usage — both directly through the possibility of increased accident potential derived from nonusage, and indirectly through the expenditure of public resources as a consequence of the crash — to enable the courts to mandate helmet usage.

Argument #2: The Motorcycle Helmet Laws Restrict the  
Personal Freedom of Choice of the Motorcyclist and Restrict  
His or Her First Amendment Freedom of Speech

All laws, by definition, restrict personal freedom. This restriction is tolerated by individuals in light of the benefits to the individual and to society derived from the legislation. However, the freedom of individual expression cannot be amended without strong justification, in that

Freedom of choice, if that choice does not affect the public welfare, includes the right to make what the majority believes to be the wrong or unintelligent choice as well as the right of intelligent choice. For if the majority can set itself up as judge, in matters of individual welfare, between right and wrong, and enforce those judgements with criminal sanctions, then all areas of personal liberty will be jeopardized. City of Seattle v. Zektzer, Seattle Municipal Court, Washington (1967).

The key phrase to be considered in relation to the violation of personal freedom in the motorcycle helmet laws is, "if that choice does not affect the public welfare...." It has been clearly demonstrated that the outcome of motorcycle accidents affects the public interest, in that society bears many of the "costs" of these crashes. Additionally, there is precedent for the state to protect its citizens from relative risk, and even from their own indiscretions, in that "many states require safety devices to be worn by window cleaners, eye protection for welders, hard hats for those involved in demolition work, life preservers to be worn while water skiing and nets protecting aerial performers from the effects of accidental falls. Headgear legislation belongs to this class of legislation."<sup>(54)</sup> Again, it can be concluded that sufficient public interest exists to justify amendment of an individual's freedom of choice.

It has also been argued that by limiting the motorcyclist's freedom of choice in vehicle, the state limits his freedom of expression, thus violating his first amendment right to free speech. The courts have ruled that the non-speech characteristics of this form of expression are the significant factors in its definition, and thus that the choice of vehicle or choice of head protection does not constitute a "speech" per se, and thus the helmet restrictions do not violate freedom of speech. State v. Quinan, 67 A. 2d 1032 (Me. 1977).

Argument #3: The Mandatory Motorcycle Helmet Laws Represent A Denial of Equal Protection Under Law, in That They Unreasonably Single Out and Discriminate Against Motorcycle Riders as a Class

The answer most often given to this argument states that there is an increased risk under which motorcycle riders operate and this difference in risk offers a rational basis for their differential treatment. Manzanares v. Bell, 214 Kan. 589, 522 P. 2d 1291, (1974). The literature supports the idea that cyclists operate at greater risk than do operators of other motor vehicles, due to the riding characteristics of the vehicle of their choice and due to the cyclist's greater vulnerability to injury. For instance, while motorcycles account for only 3.7% of all motor vehicle registrations, they account for 6.8% of all fatalities from motor vehicle crashes.<sup>(39)</sup> This over-representation in accidents becomes especially meaningful in light of the high probability of serious injury or death once a motorcycle accident has occurred.<sup>(12)</sup> It has even been estimated that the risk of death in a motorcycle crash is 5.12 times as high as the risk of death in other motor vehicle crashes.<sup>(56)</sup> Thus, it can be concluded that

motorcycles form a distinct class of vehicles, that motorcycle operators, since unincluded, have considerably less body and head protection than included vehicle operators; and that therefore the headgear requirement for motorcyclists as distinguished from operators of other types of motor vehicles constituted a *reasonable means* to protect users of the highway from the greater hazards caused by the motorcyclist's increased vulnerability to loss of control. (32 A.L.R. 3d 1270)

Argument #4: The Motorcycle Helmet Laws Represent  
An Illegal Delegation of Power

It has been argued that the state legislatures do not have the right to pass helmet laws and to delegate authority for the enforcement of such laws, nor do they have the right to give administrative bodies the power to set standards for motorcycle helmets themselves.<sup>(53)</sup> However, "the police power of the state is the power vested in the legislature to make, ordain and establish all manner of wholesome and reasonable laws, statutes and ordinances, either with or without penalties, not repugnant to the constitution as they shall judge to provide the greatest welfare to the state."<sup>(55)</sup> This reasoning extends not only to the suppression of activity but also to the encouragement of activity. Treigle v. Acme Homestead Assn., 297 U. S. 189, 197 (1936). This reasoning also applies to the regulation of highway travel, in that "motor vehicles are dangerous machines, and, even when skillfully and carefully operated, their use is attended by serious dangers to persons and property. In the public interest, the state may make and enforce regulations reasonably calculated to promote care on the part of all who use its highways." Hess v. Pawloski, 274 U. S. 352, 356 (1927). Thus, it is within the power of the legislature to make laws governing motorists, including motorcyclists, and it is within the police power of the state to legally enforce such laws.

In relation to delegating the responsibility for making standards for helmet design to administrative units, the legislatures have specifically defined the scope of authority of the standardizing organization to encompass only certain specific decisions. This action does not constitute illegal delegation of power.<sup>(53)</sup>

Argument #5: The Helmet Laws Are Essentially Penal  
in Nature and Thus Must be Strictly Constructed.  
The Mandatory Helmet Use Standards Are Vague and  
Indefinite, and Do Not Give the Rider Adequate Notice  
As to What is Expected of Him or Her

Motorcycle helmet legislation, in lawfully delegating the responsibility for its enforcement to "administrative officials," clearly describes the job to be done, who will do it, and the scope of their authority.<sup>(54)</sup> The laws make reasonably clear what is expected of the motorcyclist — i.e. that headgear be worn while riding. The courts have also ruled that "headgear" is not a vague term but has a special meaning when applied to motorcycles. Cesin v. State, 288 So.2d 473, Fla. (1974). Thus, this type of legislation is not vague in the legal sense.<sup>(53,55)</sup>

In addition to the successful defense against the constitutional challenges presented in these arguments, there is an additional argument which supports the constitutionality of the mandatory helmet laws; namely, the general assumption of constitutionality afforded statutes passed by the legislatures.<sup>(53,54,55)</sup> In the case of mandatory helmet use, the legislatures have passed the statutes at the express wish of Congress.

In summary, it can be said that "all in all, the great weight of judicial authority has concluded that the motorcycle helmet laws raise no constitutional issues: These statutes were within the scope of legislature power; and the opponents' arguments are for the legislature — and not the courts — to consider."<sup>(53)</sup>

#### WHY ARE STATES REPEALING THEIR HELMET LAWS?

In the two preceding sections, it has been concluded that motorcycle helmets and the helmet laws have been effective in reducing serious injury and fatalities, and that the helmet laws are constitutional and do not violate personal freedom of expression. Why, then, in spite of the vast body of evidence, have state legislatures repealed their helmet laws so freely? In order to answer this question, a survey of states repealing their helmet laws was conducted. The Office of the Governor's Representative for Highway Safety in each state was contacted, and each state's specialist in this area was asked why he felt that helmet legislation was repealed.

The results of these interviews were very enlightening. Respondents in all of the states repealing the helmet laws mentioned the impact made by the very vocal, very visible anti-helmet lobby, which often included both in state and out of state components, as a most influential factor in repeal. These groups, including most often ABATE (The American Brotherhood Against Totalitarian Enactment), were very active during the legislative session flooding committee meetings with as many members of their groups as possible, conducting mail campaigns, contacting legislators personally, and organizing large-scale demonstrations. The effects that these demonstrations had on the legislature (as indicated by the Governor's representatives' staffs) fall largely into two categories as discussed in the following paragraph.

1. Influence in relation to perceived public opinion. It was the contention of several of the safety specialists that legislators were influenced by the obvious size of the demonstrations and by the extent to which the group members participated in the legislative process. It is possible that these two factors were interpreted by legislators, either formally or informally, to mean that a significant number of their constituents held opinions similar to those held by the antihelmet groups and that their constituents would favor the repeal.

In relation to influencing legislation, it should be pointed out that a strong lobby does not necessarily reflect the majority opinion of either the general public or of the motorcycle riders themselves. In this case, it can be shown that the public sentiment is not represented by the anti-helmet law lobby, either nationally or in Virginia. As shown in Table 5, many states have conducted public opinion polls in relation to their helmet laws. Three states conducted telephone or mail surveys of motorcycle operators who had survived a crash. As would be expected, a majority of the accident involved riders felt that helmet usage increased (or would have increased) their chances of survival. This feeling was the same for helmet wearers and nonwearers in Arizona,<sup>(6)</sup> but was considerably less prevalent among nonwearers in Nebraska.<sup>(5)</sup> In Idaho, 77% of the injury accident involved motorcyclists favored some form of mandatory helmet law.<sup>(57)</sup> While these studies were scientifically conducted, they reflect only the views of accident involved cyclists. Several other polls have been conducted which sample the opinion of the general public, the opinion of motorcyclists, or the opinion of both. In both the Pennsylvania and Wisconsin polls,<sup>(25,46)</sup> the vast majority of the general public favored the mandatory helmet laws (87% and 97%, respectively) while a lesser majority of motorcyclists held a similar opinion (55% and 62%). In Missouri, 70% of the motorcyclists favored the mandatory helmet laws,<sup>(46)</sup> while in Utah 75% favored Utah's version of the mandatory laws, which exempts riders travelling under 35 mph.<sup>(42)</sup> However, only 29% of the Utah motorcyclists favored a blanket motorcycle helmet law.

A public opinion poll concerning this issue was also conducted in Virginia and included both the general public and motorcyclists. As seen in Table 6, 81% of all motorcyclists in the state feel that motorcyclists should be required to wear helmets while they are riding, while 92% of the nonmotorcyclists expressed this opinion. Thus, an overwhelming majority of Virginians, including cyclists, do not agree with the antihelmet groups in the state, and would not favor repeal of the current mandatory motorcycle helmet laws.

TABLE 5  
RESULTS OF PUBLIC OPINION POLLS CONDUCTED ON THE  
EFFECTIVENESS OF MOTORCYCLE HELMETS

<u>Author</u>	<u>Location</u>	<u>Group Surveyed</u>	<u>Findings</u>
Decher (1977)	Arizona	Accident involved motorcycle operators	(1) In all accidents where an impact occurred, all helmet-wearing operators felt that the helmet averted serious injury.  (2) In the same situation, all non-wearers felt that serious injury would have been avoided or reduced by a helmet.
Nebraska Dept. of Roads (1975)	Nebraska	Accident involved motorcycle operators	(1) 80% of the helmet wearers felt that the helmet avoided or reduced serious injuries.  (2) Only 20% of the nonwearers felt that a helmet would have averted or reduced serious injury.
Idaho Traffic Safety Commission (1976)	Idaho	Injury accident involved motorcycle operators	(1) 77.3% of these motorcyclists favored some form of mandatory helmet law.
Decher (1977)	Pennsylvania	General public (including motorcyclists)	(1) Among motorcyclists, 78.8% felt that helmets reduce the potential of injury. 91.8% of the general public agreed.  (2) 55% of the motorcyclists favored a mandatory helmet law. 87.1% of the general public agreed.
Decher Original Research in (1977)	Wisconsin	General public (including motorcyclists)	(1) 62% of the motorcyclists and 98% of the automobile operators favored a mandatory helmet law.
Decher Original Research in (1975)	Utah	Motorcyclists (accident involvement unknown)	(1) 29% favored a mandatory helmet law.  (2) 75% favored mandatory helmet usage, at least at speeds exceeding 35 mph.
Decher (date unknown)	Missouri	Motorcyclists	(1) 70% favored Missouri's mandatory helmet law.

Table 5

## Opinion in Virginia Concerning the Helmet Laws

	<u>Motorcyclists</u>	<u>Nonmotorcyclists</u>
Favor mandatory helmet law	81.0%	91.9%
Do not favor mandatory helmet law	18.5%	6.1%
Undecided/no opinion	<u>0.5%</u>	<u>2.0%</u>
	N = 205	N = 1,519

2. Influence in relation to the effectiveness of motorcycle helmets. In addition to claiming that the motorcycle helmet laws restrict their freedom of expression, the anti-helmet groups in several states introduced "scientific research" into the record which they claimed showed that helmet usage was ineffective in protecting riders during crashes and that it even had deleterious effects. (58,59,60,61) This "research" claimed everything from usage causing neck injuries and reducing sensory efficiency (these arguments have been discussed and rejected in previous sections) to the fact that usage caused ear callouses which could result in cancer. (62) "Although some of this information is obviously emotional in nature and substance, a significant portion purports to be scientific fact, data, or studies which conflict with those of safety professionals." (25) According to the Governor's Representatives and their staffs, while legislators were not won over by these arguments against helmet effectiveness, these "studies" were enough to cast doubt upon the previously accepted facts, since the legislators did not have the time to check out the sources and merits of the antihelmet "research". It is safe to say that these "studies" are not sufficiently adequate methodologically to allow any definitive statement on the issue in question, much less to conclude that helmets are actually dangerous to the user\*. They do not isolate the effects of helmet usage through proper study design, and thus are statements of speculation. These "studies" were not conducted by scientists specially trained in the various fields of endeavor but rather by laymen (by and large members of antihelmet groups), lacking the necessary expertise to adequately study the various aspects of helmet usage. (For instance, one study claims

\*Since the inadequacies of these "studies" are too numerous to discuss here, the reader is referred to "An Analysis of the Mandatory Motorcycle Helmet Issue", by H. E. Balmer (reference 25) for a detailed critique of the antihelmet "research".

to determine that helmets are ineffective based upon "a detailed description of high school physics equations."<sup>(51)</sup> The author of this study made invalid assumptions about the real world accident environment and, thus, the formulas used were found to be "wholly inadequate to describe an actual accident contact."<sup>(51)</sup> Due to these inadequacies, the findings of these "studies" must be set aside in favor of the scientific studies already reviewed in this report.

Thus far, the scientific literature supports the use of motorcycle helmets as an effective highway safety countermeasure. Helmet usage is also supported by a majority of Virginians. However, this rather large body of scientific evidence has failed to avert the repeal of the helmet law in many other states. It is pertinent to this issue to examine what would happen should the helmet laws be repealed in Virginia.

#### POSSIBLE CONSEQUENCES OF REPEALING THE MANDATORY MOTORCYCLE HELMET LAWS

What is likely to happen in Virginia if the motorcycle helmet laws are repealed? The best indication comes from the experiences of other states. First, from the literature <sup>(63)</sup> and from interviews with members of the governor's representatives' staffs it has been found that repeal results in a decrease in helmet usage. It could be interpolated that decreased helmet usage should result in increases in head injuries among motorcyclists. However, such a conclusion should not be accepted without empirical evidence from states that have repealed their helmet laws.

Since the repeal of the mandatory helmet laws is a relatively recent issue, very little data have been collected to determine the impact of this action on the motorcycle safety environment. Many states have informally reported increases in fatalities thus far, but they have not collected a full year of accident data as yet. Of the nine states that have repealed their helmet legislation at this writing, only three have had sufficient time to collect post-repeal accident data. In one of these three, Iowa, the helmet law was in effect for only ten months, and went unenforced for a portion of that time. These factors disqualify Iowa's inclusion in this analysis. Post-repeal data for Connecticut are not yet available, except for the data from a special study which will be discussed later. Rhode Island repealed its helmet law in May 1975, and thus is in the best position to determine the impact of repealing the helmet laws.

Data similar to those used to examine the impact of enforcing the helmet law in Virginia were solicited from the Office of the Governor's Representative in Rhode Island for the years 1963 through 1976. As shown in Table 7, the total accident/fatal accident ratio was calculated for each year to determine the overall severity of the motorcycle safety situation in Rhode Island before, during, and after enforcement of the helmet laws. This index was chosen for analysis since helmet usage should logically affect the severity of injuries in crashes which occur rather than the causation of accidents. Again, it should be remembered that the larger the ratio, the less severe the accident environment.

From Table 7 it can be seen that although motorcycle accidents were less severe during the time the helmet laws were in effect (1969-1974), compared to the prelaw period (1963-1967), this change was not significant. However, there was a significant increase in the severity of motorcycle accidents during the year following repeal (1974). Thus, repealing the helmet law in Rhode Island is associated with a significant reduction in motorcycle safety in that state in 1976. While this analysis involved only one year's post repeal accident data, it can provide an indication of the possible outcomes of repeal. Additional accident information should be studied as it becomes available. It should also be noted that the absolute number of motorcycle fatalities in 1976 was the highest ever experienced in Rhode Island, almost double the number for any other year. So far in 1977, 21 persons have been killed in motorcycle crashes, an increase over the already high 1976 figure.

While a full year's accident data were unavailable for Connecticut, the only other state repealing their long-term helmet law in 1976, a special study was conducted to compare data for June through September 1975 with those for June through September 1976 (see Table 8). While head injuries for helmet wearers decreased, such injuries for nonwearers increased fivefold. Regardless of helmet usage, head injuries doubled after repeal. Again, based on preliminary data, it appears that the repeal of the motorcycle helmet laws is associated with an increase in head injuries.

Thus, two states have experienced increases in numbers of head injuries and increases in the severity of motorcycle accidents, both associated with the repeal of the helmet law. It is possible that Virginia would experience similar problems if its helmet legislation was repealed.

In order to circumvent problems relating to total repeal of the helmet laws, many states have modified their legislation to apply only to particular age groups, usually persons 18 years old or less. Another pertinent question involves what would happen should Virginia simply modify its helmet law.

Table 7

## Rhode Island Motorcycle Accident Information

<u>Year</u>	<u>Total Number of Accidents</u>	<u>Number of Fatalities</u>	<u>Accident/Fatality Ratio</u>	
1963	195	3	65.00	Prehelmet Law
1964	219	5	43.80	
1965	218	7	31.14	
1966	318	5	63.60	
1967	199	6	33.17	
1968	150	2	75.0	
1969	187	2	93.5	Helmet Law
1970	253	3	84.33	
1971	231	8	28.88	
1972	333	6	55.50	
1973	339	8	42.25	
1974	537	9	49.67	
1975	470	10	47.00	
1976	490	19	25.79	Post- helmet Law
	Prehelmet Law Mean	—	47.34	
	Helmet Law Mean	—	60.73	
	Posthelmet Law (Standard)	—	25.79	

t value (prehelmet law/helmet law) = 1.08

p .13

t value (helmet law/postlaw standard) = 3.49

p .01

Data supplied by William Dodd, Governor's Office on Highway Safety, Rhode Island.

Table 8

Fatal Injury Distributions During and After Enforcement  
of the Mandatory Helmet Law  
(Connecticut)

	During Helmet Laws (June 1975-Sept. 1975)	After Repeal of the Helmet Law (June 1976-Sept. 1976)
	<hr/>	<hr/>
Head Injuries		
Helmet users	6	0
Helmet nonusers	4	20
Neck Injuries		
Helmet users	0	1
Helmet nonusers	0	0
Other Injuries		
Helmet users	4	1
Helmet nonusers	0	5

Data supplied by Robert Whitney, Office of the Highway Safety  
Program Administrator, Connecticut Department of Transportation.

POSSIBLE CONSEQUENCES OF MODIFYING THE HELMET LAWS TO  
APPLY ONLY TO A SPECIFIC AGE GROUP

At present, there are no direct data available on the effects of modifying the helmet laws to apply to certain age groups. Of those states reducing their laws, five did so in 1976, and have had sufficient time in which to collect impact crash data. Of these, two, Kansas and Oklahoma, changed their helmet laws several times after initial passage and thus were not suitable for inclusion in this analysis. Two more states, Arizona and Louisiana, were disqualified due to insufficient data; and a third, Alaska, was disqualified due to statutory and regulatory conflicts over enforcement of its modified law.

Since there are so little data available from states that have modified their helmet laws, the best estimation of the consequences of reduction comes from the available literature. It is generally accepted that applying the helmet laws only to persons 18 and under leaves a large proportion of riders unprotected. However, the magnitude of this unprotected segment of the motorcycling population has been somewhat underestimated. It has been determined in this country and abroad that the majority of the accident-involved riders are not under 18 but are over 20 years or between 20 and 30 years old.(5,9,17,32,42,64) Thus, although young people 18 years and under make up a substantial part of the group experiencing accidents, and thus needing protection from head injury, a larger percentage of young adults between 20 and 30 years old need this protection and would not necessarily get it under a reduced law.

Additionally, it has been shown that general motorcycle experience has much more to do with accident causation than does age, and that experience with the particular motorcycle in question has more to do with accident involvement than either of these variables. In Arizona, for instance, it was found that while 64% of the motorcyclists involved in accidents had less than 6 months of experience on the cycle in question, and often less than one day, almost all (91%) had more than one year of general riding experience.(6) This was also true in Utah, where 74% of the cyclists involved in accidents had less than one year experience on the motorcycles they crashed.(42) While many new riders would fall into the under 18 age group, this is not always the case. If any group is to be singled out for inclusion in the helmet laws, it should be those riders using a particular motorcycle for the first time, not just those in a given age group.

Thus, the consequences of reducing the helmet laws to apply only to riders 18 years old and under involve leaving two very substantial groups of riders unprotected: (1) the majority of accident-involved riders aged 20 to 30 years old, and (2) those persons over 18 years riding a particular motorcycle they have little experience with. Thus, while a reduced law is preferred over no mandatory helmet law at all, it is still not a viable solution in terms of highway safety.

#### SUMMARY

From this review of the literature, it has been determined that motorcycle helmet usage reduces the probability of being seriously injured or killed in a motorcycle accident. Enactment of the helmet laws has been associated with reduced accident severity in many states, including Virginia. It has been shown that helmet usage does not impair hearing or vision, does not encourage risk-taking, and does not increase the probability of incurring a neck injury as the result of a motorcycle crash. Thus, requiring the use of motorcycle helmets is a logical, reasonable, and effective method for improving motorcycle safety.

Additionally, the helmet laws have been ruled constitutional in the courts of last resort in 27 states, with such cases being introduced in the U. S. Supreme Court five times.\* These cases establish that the helmet laws do not constitute a violation of the first amendment right of free speech, the right of due process, or the right of equal protection. Also, these laws appear to have public support in many states among both motorcyclists and nonmotorcyclists. In Virginia, 81% of the motorcyclists and 92% of the nonmotorcyclists favor the current mandatory helmet law.

In the face of this large body of evidence supporting the helmet laws, many states have repealed or modified their helmet legislation. Highway personnel attribute these actions to the public relations campaign carried on by the antihelmet lobbies. The consequences of repealing the helmet laws have been analyzed in only two states, Rhode Island and Connecticut, but the analyses have shown increases in the severity of motorcycle accidents and increases in the numbers of fatalities and head injuries incurred. It is possible that the repeal of the helmet laws could result in similar problems in Virginia

It has been concluded from the review of the literature that the mandatory motorcycle helmet laws are an excellent example of a highway safety countermeasure which has fulfilled its potential. It is recommended that the helmet laws not be repealed in Virginia.

\*The Supreme Court declined to review state decisions four times and has affirmed one state's ruling without opinion.

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## Appendix A

CHALLENGES TO THE CONSTITUTIONALITY OF  
STATE MOTORCYCLE HELMET LAWS  
AS OF DECEMBER 1, 1976

Taken from "Staff Memorandum on the Constitutionality Question Presented by State Motorcycle Headgear Requirements" (U. S. DOT, 1976) With Supplemental Information from "Mandatory Motorcycle Helmet Legislation: A Review of the Law", (HSRI Research Review, August 1977).

I. United States Supreme Court

1. Bisenius v. Karns, 395 U. S. 709, 89 S. Ct. 2033, 23 L. Ed. 2d 655 (1969), appeal dismissed "for want of a substantial federal question".
2. Everhardt v. City of New Orleans, 395 U. S. 212, 89 S. Ct. 1775, 23 L. Ed. 2d 214 (1969), certiorari denied.
3. Krafft v. New York, 396 U. S. 24, 90 S. Ct. 198, 24 L. Ed 2d 145 (1969), certiorari denied.
4. Massachusetts v. Howie, 393 U. S. 999, 89 S. Ct. 485, 21 L. Ed 2d 464 (1968), certiorari denied.
5. Simon v. Sargent, 409 U. S. 1020, 93 S. Ct. 463, 34 L. Ed. 2d 312 (1972) aff'd mem.

II. Federal Cases

1. Simon v. Sargent, 346 F. Supp. 277 (Mass. 1972)
2. Bogue v. Faircloth, 316 F. Supp. 486 (Fla. 1970)

III. StateA. State Supreme Court (or Highest Court)

1. Arutanoff v. Metropolitan Government of Nashville, 223 Tenn. 535, 448 S.W. 2d 408 (1969)
2. Bisenius v. Karns, 42 Wis. 2d 42, 165 N. W. 2d 377, Appeal dismissed, 90 S. Ct. 198 (1969)
3. Cesin v. State, 288 So. 2d 474 (Fla. Sup. Ct. 1974)

4. City of Jackson v. Lee, 252 So. 2d 897  
(Miss. Sup. Ct. 1971)
5. City of Kenosha v. Dosemagen, 54 Wis. 2d  
269, 195 N.W. 2d 462 (1972)
6. City of Witchita v. White, 205 Kan. 408,  
469 P. 2d 287 (1970)
7. Commonwealth v. Coffman, 453 S.W. 2d 759  
(Ky. Ct. App. 1970)
8. Commonwealth v. Howie, 354 Mass. 769, 238,  
N.W. 2d 373, Cert. den., 89 S. Ct. 485 (1968)
9. Elliot v. City of Oklahoma, 471 P. 2d 944,  
(Okla. Crim. App. 1970)
10. Ex. Parte Smith, 441 S.W. 2d 544 (Tex. Crim.  
App. 1968).
11. Everhardt v. City of New Orleans, 253 La.  
285, 217 So. 2d 400, cert. den., 89 S. Ct.  
1775 (1969)
12. Kingery v. Chapple, 504 P. 2d 831 (Atlas Sup.  
Ct. 1972)
13. Love v. Bell, 171 Colo. 27, 465 P. 2d 118  
(1970)
14. Penny v. City of North Little Rock, 248 Ark.  
1158, 455 S. W. 2d 132 (1970)
15. State v. Acker, 26 Utah 2d 10, 485 P. 2d  
1038 (1971)
16. State v. Albertson, 93 Ida. 640, 470 P. 2d  
300 (1970)
17. State v. Anderson, 275 N. C. 168, 166 S. E.  
2d 49 (1969)
18. State v. Cushman, 451 S. W. 2d 17 (S.Ct. Mo.  
1970).
19. State v. Cotton, 55 Haw. 138, 516 P. 2d 709  
(1973).
20. State v. Darah, 446 S. W. 2d 745 (Mo. Sup. Ct.  
1969).

21. State v. Edwards, 287 Minn. 83, 177 N.W. 2d 40 (1970).
22. State v. Eitel, 227 So. 2d 489 (Fla. Sup. Ct. 1969).
23. State v. Fetterly, 254 Ore. 47, 456 P. 2d. 996 (1969).
24. State v. Laitinen, 77 Wash. 2d 130, 459 P. 2d 789 (1969).
25. State v. Lee, 51 Haw. 516, 465 P. 2d 573 (1970).
26. State v. Lombardi, 298 A. 2d 141 (R.I. Sup. Ct. 1972).
27. State v. Merski, 113 N.H. 323, 307 A. 2d 825 (1973).
28. State ex rel. Colvin v. Lombardi, 104 R.I. 28, 241 A. 2d 625 (1968).
29. State v. Odegaard, 164 N.W. 2d 677 (N.D. Sup. Ct. 1969).
30. State v. Solomon, 128 Vt. 197, 260 A. 2d 377 (1969).

B. Appellate Courts

1. American Motorcycle Association v. Davids, 11 Mich. App. 351, 158 N. W. 2d 72 (1968), overruled by People of the City of Adrian v. Poucher, 67 Mich. App. 133, 240 N. W. 2d 298 (1976).
2. Commonwealth v. Arnold, 215 Pa. Super. 444, 258 A. 2d 885 (1969).
3. Commonwealth v. Cowan, 344 N. E. 2d 419 (Appeals Ct. of Mass., 1976).
4. People v. Bennett, 391 N.Y.S. 2d 506 (Colonie Justice Ct. 1977).
5. People v. Carmichael, 53 Misc. 2d. 584, 279 N.Y.S. 272 (1967), rev'd., 288 N.Y.S. 2d 931 (1968).
6. People v. Crago, 18 Ill. App. 3d 396 (1974).

7. People v. Kraft, (Onondaga City Ct. 1969), upholding subdivision 6, section 381 of vehicle and traffic law; cert. den., 90 S. Ct. 198 (1969).
8. People v. Schmidt, 283 N.Y.S. 2d 290 (Erie City Ct. 1967), appeal dismissed, 295 N.Y.S. 2d 936 (1938).
9. People v. Thoreson, (Maricopa Cty. Ct. 1969), holding Arizona law unconstitutional.
10. People of the City of Adrian v. Poucher, 67 Mich. App. 133, 240 N.W. 2d 298 (1976).
11. State v. Also, 11 Ariz. App. 227, 463 P. 2d 122 (1969).
12. State v. Beeman, 25 Ariz. App. 83, 541 P. 2d 409 (1975).
13. State v. Brady, 290 A. 2d 322 (Del. 1972).
14. State v. Burzycki, 37 Law Week 2248, cert. den., 252 A. 2d 312 (Conn. 1969).
15. State v. Craig, 19 Ohio App. 2d 29, 249 N.E. 2d 75 (1969).
16. State v. Krammes, 105 N.J. Super. 345, 252 A. 2d 233 (1969).
17. State v. Mele, 103 N.J. Super. 353, 247 A. 2d 176 (1968).
18. State v. Myers, (Balto. Cty. 1969), aff'd., 1968 decision of Magistrate Ct. upholding Md. headgear and goggle legislation.
19. State v. Quinnam, 367 A. 2d 1032 (ME 1977).
20. State v. Stouffer, 28 Ohio App. 2d 229, 276 N.E. 2d 651 (1972).
21. State v. Zektzer, Sup. Ct. King City. No. 47101 (Wash. 1967) upholding Ch. 232, Sec. 4 Subd. 3, Laws of 1967, and reversing City of Seattle v. Zektzer, Seattle Mun. Ct. (1967).
22. State v. Zektzer, 13 Wash. App. 25, 533 P. 2d 399 (1975).

C. Trial Courts

1. City of Hutchinson v. Silvey, Case No. CR 8081 (D Ct. Reno City, Kansas 1967), upholding city ordinance.
2. City of Wichita v. White, 205 Kan. 408, 469 P. 2d 287 (1969), upholding city ordinance; on appeal Kansas Supreme Ct. (Case No. 45676).
3. Commonwealth v. Molter, (Delaware City Ct. Pa. 1969), No. S. A. #7, upholding P.L. 58, section 625.1 as amended.
4. People v. Bielmeyer, 54 Misc. 2d 466, 282 N.Y.S. 2d 797 (New York City Ct., 1967) upholding subdivision 6, section 381 of Vehicle and Traffic Law.
5. People v. Daugherty, (West Plains Mun. Ct., 1968) holding Missouri Law unconstitutional. (Reversed by higher court).
6. People v. Newhouse, 55 Misc. 2d 1064, 287 N.Y.S. 2d 713 (City of Ithaca, N.Y. 1968), upholding subdivision 6, section 381 of Vehicle and Traffic Law.
7. People v. Smallwood, 277 N.Y.S. 2d 429 (Ct. Spec. Sess., Irondequoit, Monroe Cty. 1967), holding unconstitutional subdivision 6, section 381 of Vehicle and Traffic Law. (Reversed by higher court).
8. People v. Wattle, (Buffalo City Ct. 1967) holding unconstitutional subdivision 6, section 381 of Vehicle and Traffic Law.
9. S. D. Motorcycle Dealers Association and Haight v. Parker, (S.D. Cir. Ct. 1968), upholding section 4 of chapter 215 of the 1967 Session Laws.
10. Sheneman v. Commonwealth ex rel Depuy, 49 D. & C 2d 107, 91 Dauph 349 (1969), upholding P.L. 58, section 625.1 as amended.
11. State v. Babbs, (Martin Cty. Ct., Fla. 1968) holding unconstitutional F. S. 317.981. (Reversed by higher court).

12. State v. Betts, 21 Ohio Misc. 175. 252 N.E. 2d 866 (Mun. Ct. City of Franklin, Ohio, 1969), holding unconstitutional § 4511.53 Revised Code. (Reversed by higher court).
13. State v. Duncan, No. 44835 (Wayne Cty. 1967), holding Michigan statute unconstitutional. (Reversed in People of the City of Adrian v. Poucher, 67 Mich. App. 133, 240 N.W. 2d 298 (1976)).
14. State v. Schlegel, (Mun. Ct. City of Toledo, Ohio 1970), holding unconstitutional § 4511.53 Revised Code. (Reversed by higher court).

### III. Opinions of States Attorneys - General

1. Opinion of Attorney-General of New Mexico, No. 69-14 Feb. 25, 1969. In response to an Attorney for the New Mexico legislative Counsel, the opinion notes cases contra position taken in No. 66-15 but states "we are unwilling to completely abandon our past position".
2. Opinion of Attorney-General of Oklahoma, No. 68-267, Dec. 31, 1968, that 470 S. Supp. 1967 §40-105(b), is unconstitutional.
3. Opinion of Attorney-General of New Mexico, No. 66-15, Feb. 1, 1966. Proposed city ordinance unconstitutional as to citizens over 18.

### D. Cases (not later reversed) Holding State Statute Unconstitutional

1. People v. Fries, 42 Ill. 2d 446, 250 N.E. 2d 149 (1969).