

MANDATORY SEAT BELT USE LAWS

by

Joseph Grey
Graduate Legal Assistant

(The opinions, findings, and conclusions expressed in this report are those of the author and not necessarily those of the sponsoring agencies.)

Virginia Highway and Transportation Research Council
(A Cooperative Organization Sponsored Jointly by the Virginia
Department of Highways & Transportation and
the University of Virginia)

Charlottesville, Virginia

January 1985
VHTRC 85-R18

SAFETY RESEARCH ADVISORY COMMITTEE

- W. E. DOUGLAS, Chairman, Director, Planning & Programs Development,
Division of Motor Vehicles
- P. L. ASH, JR., Chief of Police, Staunton, Virginia
- V. M. BURGESS, Transportation Safety Administrator, Division of Motor
Vehicles
- C. F. CLARK, Driver Services Administrator, Division of Motor Vehicles
- C. P. HEITZLER, JR., Program Manager, Department of Management Analysis
and Systems Development
- B. G. JOHNSON, Supervisor, Driver Education, Department of Education
- C. S. JOHNSON, JR., Field Supervisor - West, Department of State Police
- R. F. MCCARTY, Safety Program Coordinator, FHWA
- W. F. MCCORMICK, Assistant District Engineer, VDH&T
- R. M. MCDONALD, Project Director, Transportation Safety Training Center,
Virginia Commonwealth University
- S. D. MCHENRY, Director, Bureau of Emergency Medical Services,
Department of Health
- F. F. SMALL, Highway Engineering Program Supervisor, VDH&T
- J. A. SPENCER, Assistant Attorney General, Office of the Attorney
General
- C. B. STOKE, Research Scientist, VH&TRC
- E. W. TIMMONS, Director of Public Affairs, Tidewater AAA of Virginia,
Norfolk, Virginia

Table of Contents

	<u>Page</u>
ACKNOWLEDGEMENTS-----	v
ABSTRACT-----	vii
RECOMMENDATIONS-----	ix
INTRODUCTION-----	1
SEAT BELT USE LAWS AROUND THE WORLD-----	2
Australia-----	2
Canada-----	3
West Germany-----	4
Puerto Rico-----	5
France-----	6
Sweden-----	7
General Comments-----	7
PROJECTED EFFECTS OF A SEAT BELT LAW IN VIRGINIA-----	9
Seat Belt Usage-----	9
Accident-Related Death-----	10
Accident-Related Injury-----	13
Cost-Benefit Analysis-----	13
SEAT BELT LAWS AND PERSONAL FREEDOM -----	14
SEAT BELT LEGISLATION -----	15
REFERENCES-----	19
APPENDIX-----	A-1

ACKNOWLEDGEMENTS

The author expresses sincere appreciation to the members of the Council staff who reviewed and commented on this report. In particular, thanks go to William Kelsh for providing crash data; Toni Thompson, who typed the several drafts of the report; H. T. Craft, who edited the report; and Jean Vanderberry, who typed the final manuscript. The study was initiated at the request of Delegate J. Samuel Glasscock.

ABSTRACT

The purposes of this study were to review mandatory seat belt use laws as they have been used around the world, to forecast the impact of such a law in Virginia, and, if appropriate, to propose a mandatory seat belt law for inclusion in the Code of Virginia.

This report consists of a review of the literature on mandatory seat belt laws, an analysis of automobile crash data for Virginia for the years 1978 through 1983, and a study of available statistics on current restraint use in the Commonwealth.

The results indicate that a mandatory seat belt law would save hundreds of lives and cause great reductions in injuries from automobile accidents. The relatively low administrative costs associated with this law would be vastly outweighed by savings directly attributable to seat belt use. Consequently this report proposes that an act mandating restraint use be passed in Virginia.

RECOMMENDATIONS

- A. The Virginia General Assembly should enact a law making the use of restraint systems in automobiles compulsory. Two representative proposals are discussed on pages 15 to 18 of this report. The General Assembly may, in addition, wish to consider an exemption for out-of-state drivers.
- B. Along with the new law, Virginia should launch a long-term public information campaign on the benefits of seat belt use. This campaign would make motorists amenable to the new law and thus ensure that the legislation would be effective.
- C. Virginia's state and local police departments should be encouraged to vigorously enforce the new restraint use law. Enforcement need not be expensive; citations for failure to use the restraints could be issued ancillary to citations for other violations. If the driving public should discover that police would be unwilling to enforce the new law, restraint use would remain at a low level.

MANDATORY SEAT BELT USE

by

Joseph Grey
Graduate Legal Assistant

INTRODUCTION

Year after year, thousands of Virginians are killed or injured in car accidents. The annual cost in terms of medical treatment, rehabilitation, and lost productivity is staggering, both for the victims and for the Commonwealth, yet many of these deaths and injuries could easily be avoided. The seat belts found in virtually every car in Virginia are, if worn, extremely effective in providing protection. Unfortunately, most Virginians choose not to use seat belts, either through habit or lack of information.

Around the world, over three dozen jurisdictions have passed legislation making seat belt use mandatory. Motorists who do not wear restraints are subject to fines and, in some places, imprisonment. In the past year two states, New Jersey and New York, have passed the first seat belts laws in the United States.

In New York, effective January 1, 1985, all drivers and front seat passengers must wear restraints. The law also applies to back seat passengers under 10 years old and to children under four, who must ride in approved child seats. Violators may be fined as much as \$50. The New York law exempts motorists who have a doctor's excuse on a prescription form. In New Jersey, a new seat belt law will become effective on March 1, 1985. This law applies to drivers and front seat passengers. New Jersey motorists who don't wear restraints will face a fine of up to \$20 unless they can produce a written excuse signed by a licensed physician.

The federal government has also gotten involved in mandatory restraint legislation. In July 1984, Elizabeth H. Dole, Secretary of the Department of Transportation, stated that, if enough states pass seat belt laws, the DOT will rescind Federal Motor Vehicle Safety Standard 208, which presently requires all new passenger cars to be equipped with automatic seat belts or air bags by April 1989. This July ruling applies only to state seat belt laws which (1) have a penalty of at least \$25, (2) exempt motorists only for medical reasons, (3) include public education programs, and (4) reduce the damages which can be awarded to accident victims who are injured while not wearing restraints.

Secretary Dole's announcement has generated a great deal of controversy. Proponents of seat belt laws are now faced with a dilemma. If they push states to enact mandatory restraint legislation, then they risk rescinding the passive restraint regulations. On the other hand, if seat belt laws are not passed by the states, then most motorists will not be protected until the mid to late 1990's. The New Jersey legislature has found a way out of this dilemma. In New Jersey, the fine for not wearing seat belts has not been set at a maximum of \$20, so as not to trigger rescission of Federal Motor Vehicle Safety Standard 208. In addition, the July 1984 DOT ruling is presently being tested in federal court. As of this writing, the ultimate disposition of this rule is uncertain.

Regardless of how the courts resolve the issues generated by Secretary Dole's announcement, mandatory restraint legislation appears to be an intriguing option for the Commonwealth of Virginia. But how are seat belt laws implemented in other countries? Are they effective? Are they costly? Are they a good idea for Virginia? These and other questions are discussed in this report.

The report is divided into four main sections. The first examines seat belt laws in six jurisdictions around the world and the second projects the effects of a mandatory restraint use law in Virginia, including the costs and benefits of such a measure. The third section looks at the relationship between seat belt laws and personal freedom, and the final part offers samples of restraint legislation.

SEAT BELT USE LAWS AROUND THE WORLD

The implementation and the effectiveness of the compulsory restraint use legislation enacted worldwide vary a great deal from country to country. Unfortunately, the statistics needed for a proper analysis of their impact are often unavailable. The data for the six nations examined for this study are relatively extensive and represent the full range of experiences encountered with seat belt use laws.

Australia

In 1970, Victoria became the first state in Australia to enact a mandatory seat belt use law. This law was so successful that by 1972 every state on the continent had passed similar legislation.(1) Today, most auto occupants in Australia are required to wear available safety belts. Only children, local deliverymen, persons with certificates from either physicians or motor vehicle commissions, and people driving cars in reverse gear are exempted from the law. The penalty for violation is

a fine ranging from about US\$5 to US\$258 with a possible prison term of six months. The average fine imposed on offenders is less than US\$20.(1)

Before the eight seat belt laws went into effect in Australia, massive public education campaigns were undertaken to convince citizens of the benefits of using safety belts. Additionally, the police issued warnings instead of citations for the first month or two after the laws went into effect. The evidence from Australia suggests that the level of enforcement varies a great deal from state to state. In all Australian states, seat belt laws are enforced in conjunction with other violations. In other words, the police issue seat belt citations only when a motorist has been stopped for another offense such as speeding or drunken driving.(1)

Mandatory seat belt legislation has had a dramatic impact on belt usage rates in Australia. Before the laws were passed, 18% of the motorists in Victoria wore seat belts. Immediately after enactment, wearing rates jumped to 75% in urban areas and 64% in the countryside. Since then, usage rates have risen to 90% in the cities and 80% in rural areas.(2) Similar increases have occurred across Australia.

While seat belt usage has skyrocketed Down Under, the rates of death and serious injury have fallen. One study estimated that 1980 fatalities and injuries to motorists in Victoria were 44% and 45% lower than expected, mostly due to the seat belt law.(2) Another study found that over the entire continent, compulsory belt use legislation caused a 20% to 25% reduction in deaths and 20% fewer injuries.(1) Injuries that do occur are, on the average, less severe than those sustained before the seat belt law. Australia's physicians have noted fewer major or fatal injuries to the heads, chests, necks, abdomens, and arms of motorists using seat belts. In 1975, a study of hospital work loads attributed an 80% drop in severe eye injuries, 50% fewer facial and chest injuries, 40% less kneecap and hip injuries, and 27% fewer spinal cord injuries all to the compulsory seat belt use legislation.(3)

Canada

As of this writing, four provinces in Canada -- Ontario (1976), Saskatchewan (1977), British Columbia (1977), and Quebec (1976) -- have enacted mandatory seat belt use legislation. In each a driver is held responsible when any occupant of his auto is caught not using a seat belt.(1) The penalty includes a fine of from \$5 to \$200 and a maximum jail term of 60 days. Exemptions vary from province to province, but in general drivers providing services and those with medical excuses are not subject to the law.(1)

Each of the four provinces enforces mandatory seat belt use along with other traffic violations. Exact numbers of citations issued cannot be obtained from each area, but it appears that Saskatchewan and Quebec maintain the highest and lowest levels of enforcement, respectively.(1)

In conjunction with mandatory restraint laws, each provincial government and the national Transport Canada have conducted extensive public information campaigns. While these campaigns have made citizens more receptive to seat belt use and to the mandatory legislation, they have not by themselves increased wearing rates.(1) However, the combination of public information and mandatory laws has proven extremely effective in raising restraint usage rates. Belt use in Ontario jumped from 17% before the legislation to 77% after enforcement of the new law. In Saskatchewan, wearing rates increased from 26% to 78% for drivers. No increase in belt usage was found in nearby provinces which had not passed compulsory laws.(4) Long-term trends in wearing rates are substantial if not as impressive as the short-term data. In 1978, belt usage among drivers was 64% in Ontario and 68% in Saskatchewan.(1) The literature blames lowering rates on a lack of enforcement by Canadian officials.(5) Notwithstanding this drop, restraint usage has stabilized at a level 40 to 50 percentage points above pre-legislation figures.

The net effect of compulsory seat belt laws on driving-related fatalities and injuries is difficult to discern. Of all the provinces with such laws, only Ontario provides adequate data, and Ontario lowered its speed limit in conjunction with the seat belt act. Therefore, one cannot tell how much of the reduction in fatalities (18.3%) and injuries (19.4%) is attributable to the seat belt law alone.(1) Canadian studies do indicate that emergency medical expenses, general medical costs, and rehabilitation charges are all lower for motorists injured while wearing seat belts than they are for nonusers.(6) Overall, average hospital costs for those wearing belts are about half those of nonusers (\$228 and \$419, respectively).(5) The compulsory restraint legislation has also caused an unexpected shortage of organ donors in Ontario, where victims of car crashes formerly provided much of the supply.(7)

West Germany

On January 1, 1976, West Germany's compulsory seat belt law became effective. All front seat occupants of passenger cars are required to wear a safety belt, except for taxi and rental car drivers, deliverymen, persons driving cars in reverse gear or at very slow speeds, those with medical exemptions signed by a physician, and children under 12, who are required to remain in the back seat. Police are urged to inform non-users of the law, but there is no penalty for noncompliance.(1)

Prior to the enactment of the seat belt law the German government financed information campaigns to educate the public on safety belt use, but these programs failed to make a meaningful long-term impact on seat belt wearing rates.(1)

West Germany's mandatory restraint law had more success in raising seat belt use rates. On city streets, wearing rates climbed from 15% to 47% and on country roads they rose from 27% to 64%. On freeways, where the use of restraints was already 47%, the compulsory law has caused an increase to 77%. The weighted averages for all of Germany are 25% use before the law and 58% after enforcement began.(1)

Unfortunately, there are no reliable data on the effects of mandatory seat belt use legislation on Germany's fatality and injury rates.(1)

Puerto Rico

Puerto Rico's seat belt use law became effective on January 1, 1974.(1) Drivers and passengers are required to wear available safety belts while travelling on public highways. Offenders pay a fine of \$10 to \$25. Puerto Rico allows many exceptions to the law, including car occupants shorter than 55 inches, those with medical exemptions, occupational drivers, drivers who claim that the shoulder belt "interferes" with operation of the car, and others who qualify because of "size, physical deformity or extreme obesity."(1) Most Puerto Rican drivers can avoid fines by claiming one or more of these exemptions.(8)

Along with the mandatory seat belt law, Puerto Rico conducted a number of public information campaigns. These programs included talks at schools and meetings as well as mass media appeals.(1) Although the literature offers no statistical proof, officials report that educational campaigns helped both to make the public receptive to the mandatory seat belt law and to teach citizens about proper belt use.(9)

Puerto Rican police began issuing citations for seat belt nonuse almost two months after the law became effective. However, the level of enforcement activity, as indicated by the number of citations issued, fluctuated a great deal from 1974 to 1977, and the usage rates varied directly with the enforcement activity. During periods when few citations were issued, restraint wearing dropped below 10%. When, as in 1975, police enforced the law with more vigor, seat belt usage rates rose to as high as 35%.(9)

The evidence from Puerto Rico is insufficient to support a detailed analysis of the effects of the mandatory restraint use law. However, one may conclude that when enforcement and public education were

vigorously pursued by officials, seat belt wearing rates increased and driving fatalities decreased significantly.(1) In addition, physicians from Puerto Rico report that seat belts, when used, dramatically reduce accident-related injuries.(10)

France

In France, a compulsory seat belt usage law came into effect on July 1, 1973. Front seat occupants must wear restraints between 10:00 p.m. and 6:00 a.m. in towns and at all times on roads outside towns.(1) The law does not apply to taxi drivers, children under 12, pregnant women, those less than 55 inches tall, or people with medical exemptions signed by a doctor. Violators may be fined \$13 to \$20 (in 1980 US dollars).(1)

France's mandatory restraint law is enforced by a number of organizations. Municipal authorities monitor seat belt usage on town and city roads. Roads outside towns are under the jurisdiction of the Gendarmerie Nationale. French officials report that the Gendarmerie Nationale is more conscientious about enforcing the mandatory seat belt law than are the municipal police. In any case, restraint usage is usually enforced along with other traffic violations.(1)

Concomitant with the introduction of a seat belt use law, French officials ran extensive public education programs on safety restraints. These programs made the public more amenable to the new law, but by themselves did not increase seat belt use.(1)

Seat belt usage rates in France appear to be influenced more by levels of enforcement than anything else. Immediately after the law became effective, wearing rose from a pre-legislation rate of approximately 20% to 80%. However, the authorities did not enforce the new law and soon usage dropped to 50% on roads outside towns. Alarmed by this drop, the Gendarmerie Nationale redoubled its enforcement efforts, and by 1975 wearing rates were back up to near 80%. On city roads, where the law applied only at nighttime and where enforcement was relatively loose, belt usage remained at 30% to 50%.(1)

Unfortunately, there are no hard data on how the mandatory restraint law has affected death and injury rates on France's roads. Unofficial reports claim that seat belts have reduced fatalities by 63%. Although these reports are impossible to support or refute without proper statistical evidence, it is fair to say that in French automobile accidents, drivers without seat belts are 2.5 times more likely to be killed or injured than are drivers wearing safety restraints.(11)

Sweden

Since January 1, 1975, front seat passengers of all cars in Sweden have been required to wear available seat belts. Children under 15, people less than 55 inches tall, taxi occupants, and those with medical exemptions are all immune from prosecution. Other violators may be fined approximately \$23.50 (based on 1980 US dollars).(1)

In Sweden, compliance with the seat belt law is monitored when motorists are stopped for other traffic violations. Government officials do not believe in devoting special enforcement efforts to increase seat belt wearing rates.

The Swedish government conducted a low-key campaign on belt use soon after the mandatory law was passed. However, for four years prior to the law's enactment, the national Department of Traffic Safety and insurance companies had run extensive public education programs. As a result, motorists knew about both passage of the mandatory law and the benefits of seat belt use.(1)

Sweden's mandatory restraint legislation had a marked effect on belt use. Before enactment of the law, wearing rates in cities and rural areas were 22% and 50%, respectively; afterwards, these figures jumped to 75% and 87%.(1)

There is little information on the effectiveness of seat belt legislation in Sweden. However, a hospital survey found that accident-related admissions dropped by 29% after the new law went into effect. Additionally, the use of seat belts was found to reduce deaths and severe injuries by 50% to 70% in all types of collisions.(11)

General Comments

Today, over 25 countries around the world have some sort of mandatory seat belt law. Usually these laws apply to front seat occupants of cars. Most countries provide exemptions for children, drivers of commercial vehicles, and persons who have a certificate signed by a physician. While a wide variety of penalties may be imposed on violators, noncompliance generally leads only to a small fine of US\$10 or less.(1)

Compulsory seat belt use legislation is, in practice, inexpensive. Law enforcement authorities need not exert special efforts to monitor safety restraint use. Around the world, these laws are generally enforced in conjunction with other traffic violations. More significant costs are associated with the public information campaigns used to improve attitudes towards seat belt use. However, in many of the

countries surveyed, private sources such as insurance companies have helped develop these educational programs. Thus, the net costs to governments from the implementation of compulsory restraint laws have been rather low.(1)

Mandatory seat belt laws had an effect on restraint usage in every country studied. Generally, wearing rates rose 200% to 400% immediately after the law became effective. After a short period of time, the rates fell 10 to 20 percentage points, only to later rise gradually to a plateau.(1) The details of changing belt usage rates vary a great deal from nation to nation. But it is clear that two variables are primarily responsible for wearing rates: public education and law enforcement.

Public education and vigorous law enforcement are critical to the success of a seat belt use law. Educational campaigns can change public attitudes towards seat belts and restraint laws. These campaigns also affect the quality of enforcement. In countries where mandatory seat belt laws were not generally accepted, the police refused to issue citations.(1) Enforcement is absolutely necessary to maintain high wearing rates. After the initial flush of belt usage experienced in most countries, wearing rates varied according to the likelihood of apprehension. In Canada and Puerto Rico, conscientious enforcement efforts yielded dramatic increases in belt usage. When police again became careless, wearing rates declined.(1)

Of course, any piece of legislation should be judged by its effects on society. The impact of seat belt laws around the world on accident-related injuries and deaths is difficult to discern. In many countries there are not enough data to generate any kind of analysis. In other jurisdictions, such as Ontario, one cannot separate the effects of seat belt laws from the consequences of other traffic regulations.(1) However, there is enough information to support a few broad conclusions.

The experience of other countries proves that mandatory seat belt use laws can save motorists from death and serious injury. In Victoria, Australia, where enforcement is particularly vigorous, driving fatalities have decreased by 44%. In most nations the actual net reductions in driving-related deaths have been somewhat lower than originally expected. This may be because motorists who refuse to wear belts after a law is in effect are more accident-prone than belt users. Nonetheless, jurisdictions with seat belt laws show reductions in deaths and injuries resulting from car accidents. When injuries do occur, they tend to be less serious and less expensive to treat.

In sum, mandatory restraint legislation appears to be extremely cost effective. The investment of relatively cheap enforcement and public education programs yields significant savings in medical care, rehabilitation, insurance premiums, and the like. Although the net

effects of this legislation are not as great as originally anticipated, seat belt laws still offer a viable, relatively painless way to save thousands of motorists from death and serious injury.

PROJECTED EFFECTS OF A SEAT BELT LAW IN VIRGINIA

This section examines the most likely effects of a compulsory restraint use law in Virginia. The projections are divided into three categories: seat belt usage, accident-related death, and accident-related injury. These projections are generally conservative. For example, whenever possible estimates have been based on drivers only. Other car occupants who would be saved from death or physical harm have been excluded. Hence, the actual consequences of a seat belt use law in Virginia may be much more beneficial than predicted here.

Seat Belt Usage

In 1977 and 1983, the Virginia Highway and Transportation Research Council conducted surveys of seat belt use among urban motorists in the Commonwealth. (12, 13) These surveys reveal several interesting points relevant to mandatory seat belt legislation.

First, belt use among drivers was measured at 16.3% in 1977 and 16.4% in 1983. Among passengers younger than four years, there was a drastic improvement in restraint usage -- from 10.2% in 1977 to 66.8% in 1983. Fully 76.0% of the infants surveyed in 1983 were protected by a restraint, up from 29.7% in 1977. These increases are primarily due to the passage of Virginia's child restraint legislation, which became effective on January 1, 1983. (13)

The child restraint law also created secondary benefits in Virginia. In the 1983 survey, when infants were found in child safety seats, 25.1% of the drivers wore seat belts as well. Other automobile occupants also showed increased wearing rates in cars which contained restrained infants. Similarly, the 1983 survey showed that when drivers wore safety belts, 35% of their passengers buckled up. Overall, only 19% of the passengers studied used available restraints. In other words, passengers were almost twice as likely to wear restraints when their drivers did so. (13)

Were Virginia to enact a mandatory seat belt use law, wearing rates would undoubtedly skyrocket. Immediately after passage of the law, probably 70% to 80% of the Commonwealth's motorists would use some sort of restraint. This estimate is based on the experience of other,

relatively similar jurisdictions such as Ontario, Canada, and Victoria, Australia, and the success of Virginia's child restraint law.

After this initial surge in seat belt utilization, there may be some decline, depending on the level of enforcement exercised by the police. If few citations are issued to nonusers, wearing rates can be expected to decrease to the 30% to 50% range as in West Germany. If there is no enforcement, the mandatory restraint law may have no effect, as has happened in Puerto Rico. However, if police officers conscientiously issue citations to motorists found not wearing seat belts, the high initial usage rates can be maintained and even augmented over time. This is what has occurred in Victoria, Australia, where authorities have gone to no extra trouble to promote seat belt wearing. Restraint usage there is enforced only in conjunction with other traffic offenses.

A mandatory restraint law in Virginia would be more effective if it is accompanied by a long-term public education program. As has been the case in other jurisdictions, and with the Commonwealth's child safety seat law, information campaigns increase public acceptance of, compliance with, and police enforcement of restraint legislation. Without some sort of public education program, it is unlikely that a seat belt law would be effective.

Accident-Related Death

Although usage rates are relatively simple to predict, the true measure of a mandatory belt usage law is its effect on deaths and serious injuries. Unfortunately, the literature offers no easy way to forecast how a seat belt law will affect the number of highway fatalities in Virginia. In this report, three data bases are examined. Each of the three has substantial flaws, but together they lend support to a few broad conclusions.

The first estimate of death rates under a mandatory seat belt law is based on data compiled by the Virginia State Police over the years 1978 through 1983. (14) During this time, one finds a sample of 209,094 drivers killed or injured in automobile accidents. Of these drivers, 19,544 or 9.3% were wearing lap belts, shoulder harnesses, or both. The remaining 189,550 used no restraints whatsoever. Ninety, or less than 0.5%, of the belt users and 3,039, or 1.6%, of the nonusers died as a result of their accidents. In other words, nonusers were almost 3.5 times more likely to be killed. (14)

Based on these fatality rates, Table 1 shows the number of lives that might have been saved had more accident victims worn their seat belts.

Table 1

Expected Driver Fatalities And Seat Belt Use 1978-1983

<u>Percentage Seat Belt Use</u>	<u>Number of of Deaths</u>	<u>Lives Saved</u>
100	963	2,166
80	1,441	1,688
70	1,680	1,449
60	1,919	1,210
50	2,158	971
25	2,755	374
9.347*	3,129	-

* Actual figure. (14)

Table 1 indicates that every extra percentage point of restraint use might have saved 24 lives over the six-year period, or about four lives annually. A mandatory seat belt law in Virginia would probably raise long-term use rates to between 50% and 80%. At these usage levels, restraints could save 971 to 1,688 lives over six years, or 162 to 261 lives per year. Even an extremely modest increase in belt use to 25% could prevent 66 driver fatalities per year.

The second method of predicting the effects of a compulsory seat belt law is based on estimates from the National Highway Traffic Safety Administration. That agency has reported that if the national restraint usage rate had been 70% in 1979, 8,500 fewer motorists would have died. (15) Over the years 1978 through 1983, Virginia traffic deaths comprised roughly 2% of the national total. (14) Thus, one may estimate that 70% seat belt usage would have saved 2% of 8,500, or 170 lives throughout the Commonwealth in 1979.

Finally, other jurisdictions provide information from which one can predict the effect of a mandatory seat belt use law on Virginia's traffic death rate. One study found that in jurisdictions with compulsory seat belt laws, death rates dropped by 15% to 30%. (1) From 1978 to 1983, 3,129 drivers died in collisions in Virginia. (14) A 15% to 30% reduction would have meant 469 to 939 fewer fatalities, or 78 to 157 lives saved per year. These estimated reductions may be overly conservative, since they include jurisdictions where seat belt use laws are not enforced. In Victoria, Australia, where police conscientiously issue citations to nonusers, the actual death rate is 44% less than predicted. (2) A similar reduction in Virginia fatalities would save the lives of 230 drivers each year.

Each of the three sources used to predict death rates in the Commonwealth leaves much to be desired. The data from national and international sources fail to account for the safety improvements made in American cars over the past five or six years. Today, the average car in the United States is equipped with restraints which are more effective and easier to wear properly than the restraints used around the world in the 1970's. Hence, a mandatory seat belt use law enacted in the 1980's may well reduce death rates far more than predicted.

Similarly, statistics drawn solely from Virginia fail to account for the fact that in jurisdictions with seat belt laws, unbelted motorists tend to be overrepresented in accidents. There are two possible explanations for this phenomenon. First, it is possible that the 20% to 30% of drivers who refuse to buckle up even after a law is passed are more accident-prone than other motorists. On the other hand, seat belts may actually make people better drivers. One recent study found that when young drivers are told to wear seat belts, they see themselves as more likely to have an accident. (16) The authors suggest that increased risk perception causes these young motorists to drive more carefully. (16) Therefore, it is conceivable that a mandatory restraint use law would actually reduce the number of accidents in Virginia each year and, at the same time, lower the severity of the accidents that do occur.

Regardless of the deficiencies in each particular estimate, it is clear that a mandatory seat belt law would dramatically reduce highway deaths in Virginia. Three independent data bases each yield fatality reductions involving roughly 100 to 250 lives per year. Furthermore, most of these estimates are for drivers only. Even if Virginia passes a restraint use law exclusively for drivers, there will be some increase in passenger belt wearing rates and, in turn, a reduction of passenger deaths.

Besides the immeasurable impact in terms of human lives, lower death rates also promise substantial monetary savings to the Commonwealth of Virginia. A 1979 study estimated that each traffic fatality costs the average state over \$12,000. (17) Since a compulsory seat belt law would save 100 to 250 drivers' lives per year, the Commonwealth would net \$1.2 to \$3.0 million annually. This sum does not include welfare payments or vocational rehabilitation expenses often borne by Virginia, and it ignores savings from reduced passenger death rates. (17) Moreover, these millions of dollars represent only the cost associated with fatalities. Seat belt use legislation will also prevent many serious injuries in Virginia, consequently saving the Commonwealth even further expense.

Accident-Related Injury

In addition to lowering traffic deaths in Virginia, a mandatory seat belt law would significantly reduce accident-related injuries. In Australia and Canada, restraint use legislation has led to dramatic drops in the demand for emergency medical services.(3,6) Every jurisdiction with a belt use law has reported noticeable reductions in both the number and severity of highway injuries.(1)

Unfortunately, it is impossible to quantify the injury-related costs which may be avoided with a seat belt law; however, it is clear that these costs are more than substantial. A 1979 study estimated that the average state spends between \$800 and \$7,000 each time a motorist is hurt, depending upon the severity of the injury.(17) Another empirical survey of accidents found that seat belts are 64% effective in reducing serious injuries. (18) In 1981 alone, 31,500 unbelted drivers were injured in Virginia.(14) Although the statistics don't indicate how severe these injuries were, it is clear from the number and cost of accident-related injuries and from the proven effectiveness of restraints that Virginia would save tremendous sums of money with a mandatory seat belt law.

On the flip side of the savings issue are the costs of a mandatory seat belt law to the Commonwealth. In terms of injuries, seat belts are relatively cost-free. An unrestrained motorist is over 154 times more likely to sustain severe injuries than is a belted car occupant.(19) Opponents of compulsory seat belt use have alleged that restraints often trap people in burning or submerged cars. In fact, a restrained motorist is more likely to retain consciousness and is thus better able to escape dangerous situations. (17) In short, seat belts do not by themselves cause injuries in the vast majority of cases.

Cost-Benefit Analysis

In addition to its other benefits, a mandatory seat belt law would be extremely cost-effective. The reduction in fatalities for drivers alone would save the Commonwealth one to two million dollars in direct costs. Savings resulting from fewer injuries are harder to quantify, but they could easily involve millions more dollars each year.

On the other hand, the cost of implementing a compulsory restraint law in Virginia would be very low. The most expensive item would be the public education program. A comparable campaign associated with the recent child restraint legislation cost the Commonwealth only approximately \$44,000. (20) A similar program today would run about \$50,000 initially. As was suggested earlier, a seat belt campaign should be extended indefinitely in order to ensure continued restraint use. This

study does not undertake to predict the precise cost of a long-term public education program, but it is clear that these costs would be negligible when compared to the millions of dollars saved each year through a reduction in automobile fatalities and injuries.

The enforcement of a seat belt law would involve extremely low marginal costs. In other jurisdictions, restraint use is efficiently maintained in conjunction with other traffic laws. Police, or their counterparts, check motorists for seat belts only if the car has been stopped for another reason, such as speeding, a sobriety check, and the like. Thus, a seat belt law requires no extra roadblocks, speed traps, arrests, or court appearances.

The Reagan Administration's emphasis on deregulation underscores the need for mandatory seat belt use legislation. In recent years, the federal government has been slow to require passive restraint systems in passenger cars. Thus, it may be many years before a viable alternative to active seat belt systems becomes available in the average American automobile. Given this state of affairs, the most efficient remedy for highway deaths and serious injuries is a law mandating the use of available restraints. (21)

In conclusion, the toll of accident-related death and injury is too high to ignore, especially when there is readily available a means to avoid hundreds of fatalities and thousands of personal injuries each year. A mandatory restraint use law in Virginia, coupled with public education and enforcement programs, will save accident victims and their families from needless pain. In turn, the Commonwealth will recover the cost of implementation many times over.

SEAT BELT LAWS AND PERSONAL FREEDOM

Opponents of mandatory restraint legislation often claim that such laws unnecessarily intrude upon the individual liberties of motorists. At first glance this argument seems intuitively plausible and yet too vague to rebut with hard facts. However, if one considers the effects of a seat belt law in the real world, one can only conclude that the intrusive aspects of such a measure are minimal, and are greatly outweighed by its benefits.

Clearly, a seat belt use act would constitute a relatively slight imposition on the average driver in Virginia. Almost all cars already have restraints in place. In most cars made after 1976, seat belts are simple to use and are self-adjusting. As was noted earlier, mandatory restraint legislation would not require any special enforcement measures; motorists will not be delayed by seat belt checkpoints and

taxpayers will not be expected to pay for extra police officers. Hence, the only imposition posed by a seat belt law involves the one or two extra seconds it takes for motorists to utilize existing restraints.

Arguments against seat belt regulations are usually based on the notion that most people oppose such laws. Available data indicate that this assumption is false. Two recent surveys in Illinois (22) and Michigan (23) both indicate that a majority of respondents actually favor the enactment of seat belt use laws. In the Michigan study (22), respondents who opposed a mandatory law often cited fear of entrapment. As was noted before, this fear is completely unfounded. In addition, people who fail to wear seat belts often claim that this behavior harms no one but themselves. This also is simply not true. First of all, unrestrained motorists pose a great risk to other car occupants in a crash. The force of a collision can turn an unbelted passenger into a lethal projectile. According to one report, restrained motorists in front seats are almost twice as likely to sustain a chest injury when there is an unbelted passenger in the back seat. (24) Second, people who fail to wear seat belts create extra expenses for the Commonwealth. Unrestrained motorists are more likely to be killed or seriously injured in a crash, thus annual costs of ambulances, police investigations, and the like are all increased. In short, the use of seat belts is not just a matter of personal choice.

In sum, the evidence suggests that most people already favor a mandatory seat belt law, and that much of the opposition is based upon false perceptions of reality. Presumably, many of the people who are presently against a restraint law would change their minds in the face of an effective public education program.

Based on the above information, mandatory restraint legislation does not appear to intrude substantially on personal freedom. There is only a slight imposition on motorists, most of whom probably favor the enactment of a seat belt law anyway. In return, such a law would save hundreds of lives, reduce many more injuries, and save millions of dollars in state funds each year. Indeed, mandatory restraint legislation can be said to promote personal freedom, since it protects the lives of individuals and reduces the need for taxes.

SEAT BELT LEGISLATION

Mandatory restraint acts have taken a number of forms around the world. The following two bills were proposed in Virginia in the 1983 and 1984 sessions of the General Assembly.

House Bill No. 642

Be it enacted by the General Assembly of Virginia:

1. That the Code of Virginia is amended by adding a section numbered 46.1-309.2 as follows:

§46.1-309.2 Motor vehicle operators required to use lap belts and shoulder harnesses: penalty. -- A. The driver of every motor vehicle required to be equipped with lap belts, shoulder harnesses, combinations thereof, or similar devices shall wear such belt, harness, combination, or similar device at all times while such motor vehicle is in operation on any public highway.

B. Where any physician licensed to practice medicine in this Commonwealth or any other state determines, through accepted medical procedures, that use of such belt, harnesses, combination or similar device by a particular person would be impractical by reason of such person's weight, physical fitness, or other medical reason, such person shall be exempt from the provisions of this section.

C. Any person, including persons subject to jurisdiction of juvenile and domestic relations district courts, found guilty of violating this section shall be subject to a civil penalty in the amount of twenty-five dollars.

D. The provisions of this section shall apply to persons actually driving motor vehicles and shall not apply to passengers in such motor vehicles.

House Bill No. 324

Be it enacted by the General Assembly of Virginia:

1. That the Code of Virginia is amended by adding a section numbered 46.1-309.2 as follows:

§46.1-309.2 Occupants of front seats of motor vehicles required to use lap belts and shoulder harnesses; penalty. --A. Each person at least sixteen years of age and occupying the front seat of a motor vehicle registered in Virginia and required to be equipped with lap belts, shoulder harnesses, combinations thereof, or similar devices shall wear the appropriate belt, harness, combination, or similar device at all times while such motor vehicle is in operation on any public highway, except that a child under the age of four years

shall be protected as required by the provisions of Article 9.1 of Chapter 4 of Title 46.1.

B. Each driver of a motor vehicle registered in Virginia and required to be equipped with lap belts, shoulder harnesses, combinations thereof, or similar devices who is transporting a child at least four years of age, but less than sixteen years of age, in the front seat of such motor vehicle shall cause such child to wear the appropriate lap belt, shoulder harness, combination thereof, or similar device.

C. Whenever any physician licensed to practice medicine in this Commonwealth or any other state determines, through accepted procedures, that use of such belts, harnesses, combinations, or similar devices by any particular person would be impractical by reason of such person's weight, physical fitness, or other medical reason, such person shall be exempt from the provisions of this section.

D. Any person who violates this section shall be subject to a civil penalty of not less than ten dollars nor more than twenty-five dollars.

E. Failure to wear a safety belt system, in violation of this section, shall not be considered evidence of negligence nor limit the liability of an insurer, nor diminish recovery for damages arising out of the ownership, maintenance, or operation of a motor vehicle. Also, in no event shall failure to wear a safety seat belt system be considered as contributory negligence, nor shall the failure to wear a safety belt system be admissible as evidence in the trial or any civil action for damages.

2. That this act shall become effective on January 1, 1985.

In general, the differences between these two bills have little bearing on their effectiveness. House Bill No. 642 covers only drivers, while Bill No. 324 regulates all front seat passengers; however, this distinction is not practically important. The average car in the Commonwealth contains approximately 1.5 occupants. (13) After deducting one or two tenths for passengers not covered by either of these bills (for example, children under four), the expected real-world differences between the proposals is even further minimized. Additionally, many passengers will buckle up along with their drivers even if the law is limited to drivers only. This phenomenon has been noted among Virginia motorists.

Both of the above proposals allow for medical exemptions. In practice, this will not be a substantial loophole in the law. The American

Medical Association has stated that all motorists, including pregnant women, should wear safety belts. (25) Given these clear professional standards, physicians will be unlikely to issue unwarranted exemptions.

Also, both Bill No. 642 and Bill No. 342 provide fines of up to \$25 for violators. This civil penalty is low enough to be enforced (in jurisdictions with severe sanctions, police refuse to issue citations).⁽¹⁾ At the same time, the inclusion of a small penalty will make the bill much more effective. In West Germany, a seat belt law with no sanctions failed to raise wearing rates to the levels attained in Canada, Australia, and Sweden.⁽¹⁾ The General Assembly may wish to reduce the fine to \$20, so that the law will not count towards rescission of Federal Motor Vehicle Safety Standard 208.

Should Virginia enact a seat belt use law in the near future, it would be one of the the first states in the country to do so. (Just this past year, New York and New Jersey became the first states to pass mandatory restraint laws.) Therefore, it may be advisable to exempt out-of-state motorists, as was done with the Commonwealth's recent child restraint legislation. This exemption would circumvent the legal and administrative problems involved in prosecuting drivers from other states for nonuse of seat belts.

REFERENCES

1. Fisher, Franklin C., Jr., Effectiveness of Safety Belt Usage Laws, Department of Transportation, National Highway Traffic Safety Administration, May 1980.
2. Joubert, P. N., "Development and Effects of Seat Belt Laws in Australia." International Symposium on Occupant Restraint, American Association for Automotive Medicine, June 1981.
3. Trinca, Gordon W., "The Medical Significance of Occupant Restraint on Road Crash Victims and Those Who Treat Them," International Symposium on Occupant Restraint, American Association for Automotive Medicine, June 1981.
4. Simpson, H. M., and Warren, R. A., "Seat Belts and Traffic Safety: The Canadian Experience," International Symposium on Occupant Restraint, American Association for Automotive Medicine, June 1981.
5. Lonero, Lawrence, P., and Pierce, Janace A., "History and Evaluation of Seat Belt Legislation in Ontario," International Symposium on Occupant Restraint, American Association for Automotive Medicine, June 1981.
6. Dagnone, L. E., and Siu, T. O., "The Effects of Seat Belt Use on the Demand for Medical Services," International Symposium on Occupant Restraint, American Association for Automotive Medicine, June 1981.
7. Lonero, Lawrence P., Statement before the Subcommittee on Investigations and Review of the House Committee on Public Works and Transportation Hearings on Safety Belt Usage, June 6, 1978.
8. Pinero, Jose A., Statement before the Subcommittee on Investigations and Review of the House Committee on Public Works and Transportation Hearings on Safety Belt Usage, January 5, 1978.
9. Oliver-Cintron, Elmer, and Serrano, Elvin T., Statement before the Subcommittee on Investigations and Review of the House Committee on Public Works and Transportation Hearings on Safety Belt Usage, January 4, 1978.
10. Mendez Castro, Herman F. and Silva, Jose Enrique, Statement before the Subcommittee on Investigations and Review of the House Committee on Public Works and Transportation Hearings on Safety Belt Usage, January 5, 1978.

11. Pulley, Charles H., Statement before the Subcommittee on Investigations and Review of the House Committee on Public Works and Transportation Hearings on Safety Belt Usage, June 6, 1978.
12. Stoke, Charles B., Seat Belt and Shoulder Strap Use Among Urban Travelers, Virginia Highway and Transportation Research Council, Charlottesville, Va., August 1978.
13. _____, Child Safety Seat and Safety Belt Use Among Urban Travelers, Virginia Highway and Transportation Research Council, Charlottesville, VA., September, 1984.
14. Department of State Police, Virginia Traffic Crash Facts, Richmond, Va., Years 1978 through 1983.
15. Claybrook, Joan, and Dugoff, Howard J., Statement before the Subcommittee on Investigations and Review of the House Committee on Public Works and Transportation Hearings on Safety Belt Usage, June 6, 8, 1978.
16. Bragg, BWE and Finn, P., Young Driver Risk-Taking Research, ABT Associates, Inc., National Highway Traffic Safety Administration, July 1982.
17. Wilson, William B., Occupant Restraint Legislation Handbook: A Guide for Proponents, Department of Transportation, National Highway Traffic Safety Administration, February 1979.
18. Huelke, D. F., "Effectiveness of Occupant Restraints in Reducing Serious Injuries and Fatalities," International Symposium on Occupant Restraint, American Association for Automotive Medicine, June 1981.
19. Zollinger, U., "Frequencies and Circumstances of Adverse Consequences of Seat Belts: Abridged Version of Dissertation," Verkehrsunfall, Vol. 16, No. 4., April 1978.
20. Estimate from the Virginia Department of Transportation Safety, Public Information Office, June 1983.
21. Brittain, Douglas, B., and Sheffi, Yosef, "Automobile-Restraint Controversy: Analysis and Recommendations," Transportation Research Record 844, National Academy of Sciences, 1982.

22. Mortimer, R. G., "Public Opinion About Seatbelts and Seatbelt Law in Illinois," American Association for Automotive Medicine Quarterly Journal Vol. 5, No. 2, April 1983.
23. Review of Telephone Survey of Michigan Residents on Seat Belt Usage and Attitudes, Fall 1982, Michigan University, Ann Arbor Transportation Research Institute, Ann Arbor, Michigan.
24. Roberts, A.K., The Effects of Rear Seat Passengers on Front Seat Occupants in Frontal Impacts, Laboratory Report, Transport and Road Research Laboratory, 1983.
25. Committee on Medical Aspects of Automotive Safety, "Automobile Safety Belts During Pregnancy," Journal of the American Medical Association, Vol. 221, No. 1., July 3, 1972.

APPENDIX

This section of the report examines some of the most recent data available on fatal automobile accidents in Virginia. The statistics cited here are taken from the 1982-1983 Fatal Accident Reporting System (FARS) data base. A total of 1,387 accident-related deaths form the sample. All of the 1,387 people in this sample were driving or riding in an automobile at the time of their fatal crash. Table A-1 breaks these deaths down according to the geographic location of the accident. Table A-2 lists the counties and cities which experienced 15 or more automobile fatalities in 1982 and 1983, and Figures A-1 through A-8 graphically illustrate the impact of automobile fatalities and seat belt use across the Commonwealth. Table A-2 and Figures A-1 through A-8 combine accident statistics for different political jurisdictions in the same geographic area. For example, the figures for Falls Church are included in those of Fairfax County. The reader may find the statistics for a given political entity by referring to Table A-2. Note that areas experiencing no traffic fatalities in 1982 or 1983 have been excluded from the tables.

Tables A-1 and A-2, and Figures A-1 through A-8 show by the sheer force of numbers that seat belts can save lives and that restraints are used all too infrequently. Earlier, this report estimated that approximately 16% of Virginia's motorists used seat belts. Table A-1 indicates that less than 3% of the motorists in the FARS sample were wearing seat belts when they died. Although other factors help to account for this disparity, and despite the fact that a mandatory seat belt law will by no means end automobile fatalities altogether, the following tables offer dramatic proof that seat belts can save lives.

Table A-1

Automobile Fatalities and Safety Belt Use 1982-1983

<u>County</u>	<u>Seat Belt Users Killed</u>	<u>Nonusers Killed</u>
Accomack		12
Albemarle	1	27
Alleghany		8
Amelia		2
Amherst		12
Appomattox		11
Arlington		14
Augusta	1	33
Bath		2
Bedford	1	15
Bland		1
Botetourt	1	10
Brunswick		10
Buchanan		12
Buckingham		4
Campbell		17
Caroline		14
Carroll	1	11
Charles City		4
Charlotte		4
Chesterfield	1	30
Clarke		5
Craig		4
Culpeper		10
Cumberland		3
Dickenson		7
Dinwiddie		11
Essex		6
Fairfax	4	73
Fauquier		19
Floyd		5
Fluvanna		3
Franklin		9
Frederick		14
Giles		12

Table A-1 (Continued)

<u>County</u>	<u>Seat Belt Users Killed</u>	<u>Nonusers Killed</u>
Gloucester		15
Goochland		9
Grayson		6
Greene		1
Greensville		18
Halifax		7
Hanover	2	24
Henrico	1	25
Henry		25
Highland		3
Isle of Wight		3
James City		13
King and Queen		4
King George		13
King William		0
Lancaster		3
Lee		9
Loudoun	2	20
Louisa	1	10
Lunenburg		2
Madison		8
Mathews		2
Mecklenburg	1	10
Middlesex		1
Montgomery		14
Nelson		5
New Kent		6
Northampton	1	8
Northumberland		2
Nottoway		3
Orange		8
Page		4
Patrick		5
Pittsylvania		22
Powhatan		4

Table A-1 (Continued)

<u>County</u>	<u>Seat Belt Users Killed</u>	<u>Nonusers Killed</u>
Prince Edward		8
Prince George	1	11
Prince William	2	34
Pulaski		12
Rappahannock	1	4
Richmond	1	7
Roanoke	1	20
Rockbridge	1	12
Rockingham	1	27
Russell		11
Scott		6
Shenandoah		17
Smyth		13
Southampton		8
Spotsylvania		21
Stafford		17
Surry		3
Sussex	1	8
Tazewell		11
Warren		6
Washington		17
Westmoreland		6
Wise		9
Wythe		9
York		23
<u>City</u>	<u>Seat Belt Users Killed</u>	<u>Nonusers Killed</u>
Alexandria		4
Bristol (in Washington County)		4
Charlottesville (in Albemarle County)		5
Chesapeake	2	32
Colonial Heights (in Chesterfield County)		1
Covington (In Alleghany County)		1
Danville (in Pittsylvania County)		3

Table A-1 (Continued)

<u>City</u>	<u>Seat Belt Users Killed</u>	<u>Nonusers Killed</u>
Emporia (in Greensville County)		1
Fairfax (in Fairfax County)		1
Falls Church (in Fairfax County)		2
Galax		1
Hampton	2	16
Harrisonburg (in Rockingham County)		2
Hopewell (in Prince George County)		2
Lynchburg (in Campbell County)		9
Martinsville (in Henry County)		3
Newport News	1	16
Norfolk		27
Petersburg		12
Portsmouth		14
Radford (in Montgomery County)		1
Richmond		33
Roanoke (in Roanoke County)	1	14
Salem (in Roanoke County)		2
South Boston (in Halifax County)	1	1
Staunton (in Augusta County)		3
Suffolk	1	26
Virginia Beach		48
Winchester (in Frederick County)		2
Total Killed	35 (2.52%)	1,352 (97.48%)

Table A-2

Automobile Fatalities and Safety Belt Use
1982-1983

Cities and Counties With 15 or More Fatalities

<u>City/County</u>	<u>Seat Belt Users</u> <u>Killed</u>	<u>Nonusers</u> <u>Killed</u>
1. Fairfax County (Including Fairfax City & Falls Church)	4	76
2. Virginia Beach		48
3. Roanoke County (Including Roanoke City and Salem)	2	36
4. Augusta (Including Staunton)	1	36
5. Prince William	2	34
6. Chesapeake	2	32
7. Albemarle (Including Charlottesville)	1	32
8. Richmond City		33
9. Chesterfield (Including Colonial Heights)	1	31
10. Rockingham (Including Harrisonburg)	1	29
11. Henry (Including Martinsville)		28
12. Norfolk		27
13. Suffolk	1	26

Table 2 (Continued)

<u>City/County</u>	<u>Seat Belt Users Killed</u>	<u>Nonusers Killed</u>
14. Campbell (Including Lynchburg)		26
15. Hanover	2	24
16. Henrico	1	25
17. Pittsylvania (Including Danville)		25
18. York		23
19. Loudoun	2	20
20. Spotsylvania		21
21. Washington (Including Bristol)		21
22. Fauquier		19
23. Greensville (Including Emporia)		19
24. Hampton	2	16
25. Newport News	1	16
26. Shenandoah		17
27. Stafford		17
28. Bedford	1	15
29. Frederick (Including Winchester)		16
30. Gloucester		15
31. Montgomery (Including Radford)		15
Totals	24 (2.85%)	818 (97.15%)

BRISTOL DISTRICT

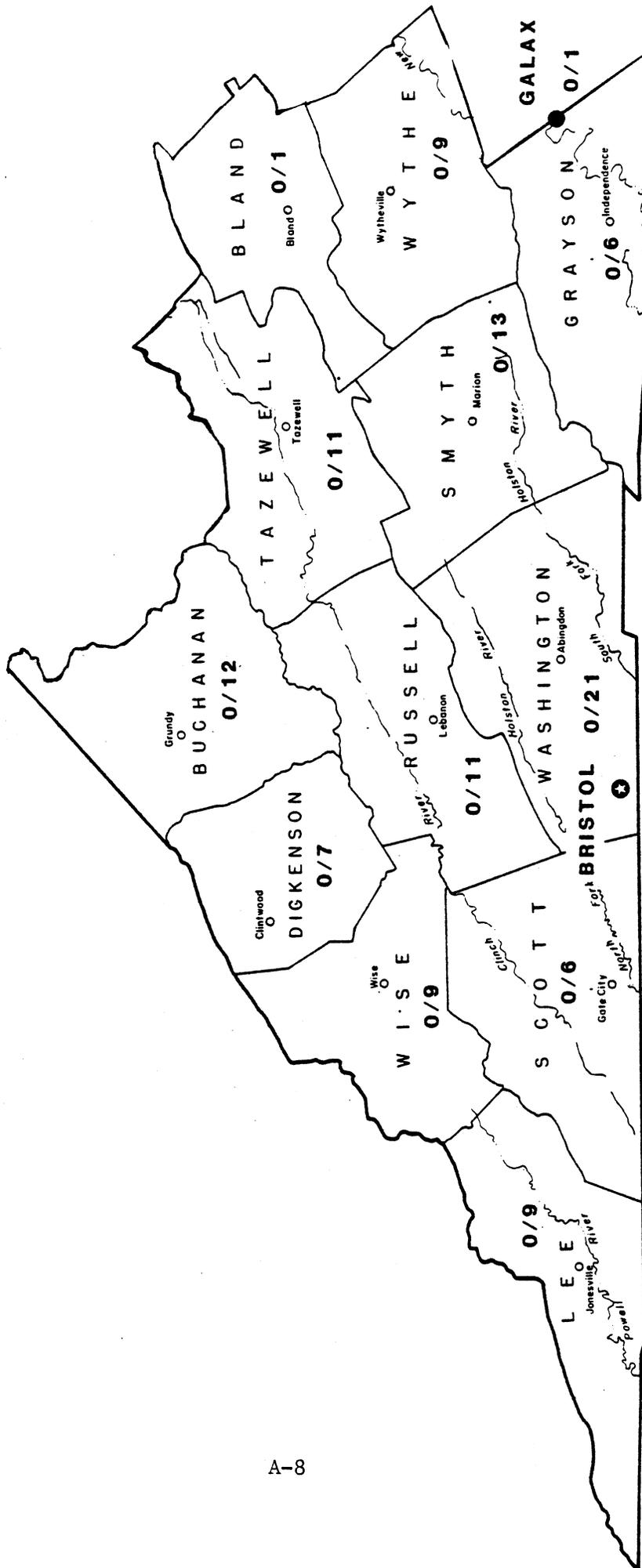


Figure A-1. Automobile Fatalities and Seat Belt Use 1982 -- 1983 FARS Data
Seat Belt Users Killed/Nonusers Killed

FREDERICKSBURG DISTRICT

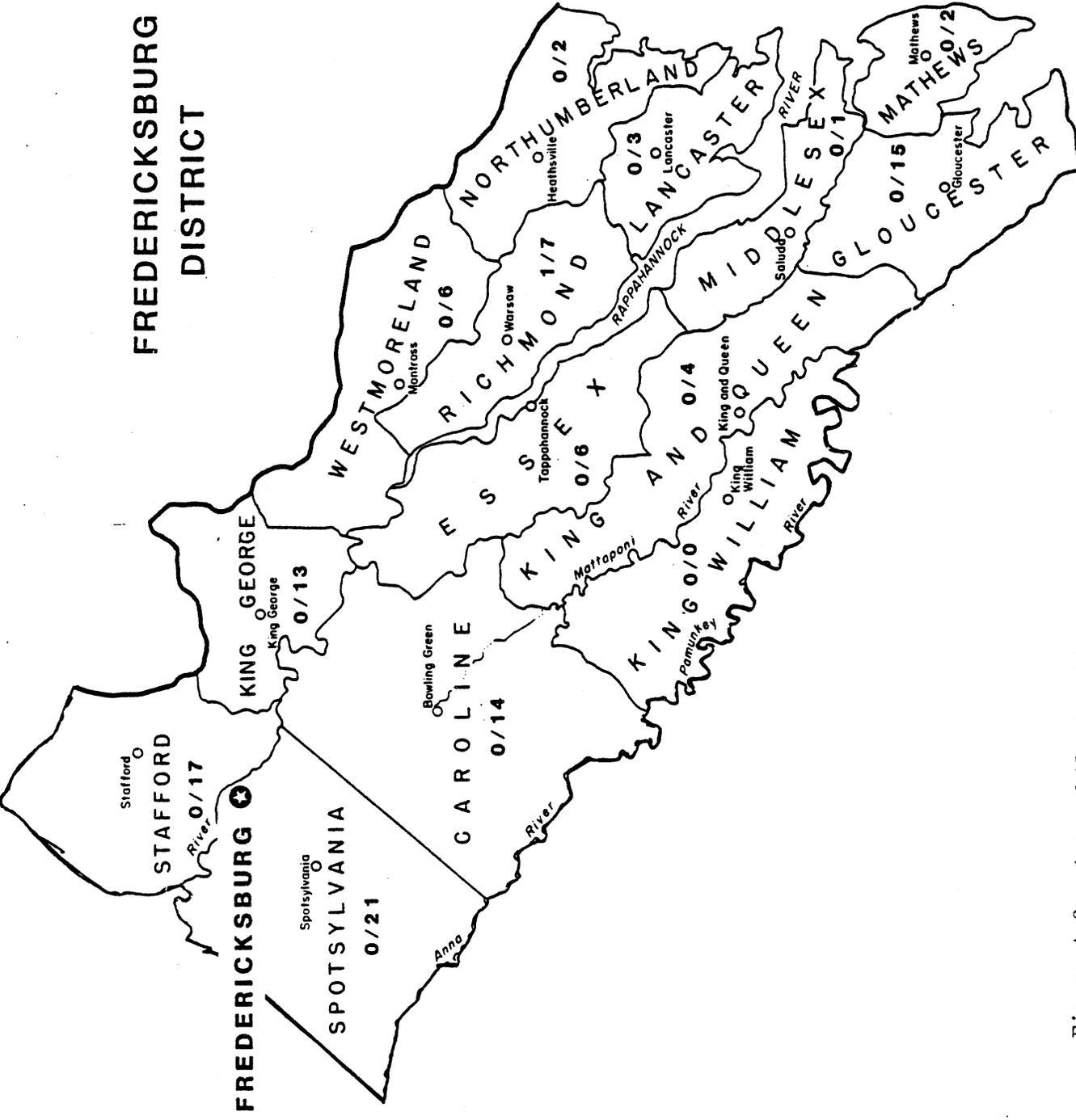


Figure A-2. Automobile Fatalities and Seat Belt Use 1982 - 1983 FARS Data
 Seat Belt Users Killed/Nonusers Killed

LYNCHBURG DISTRICT

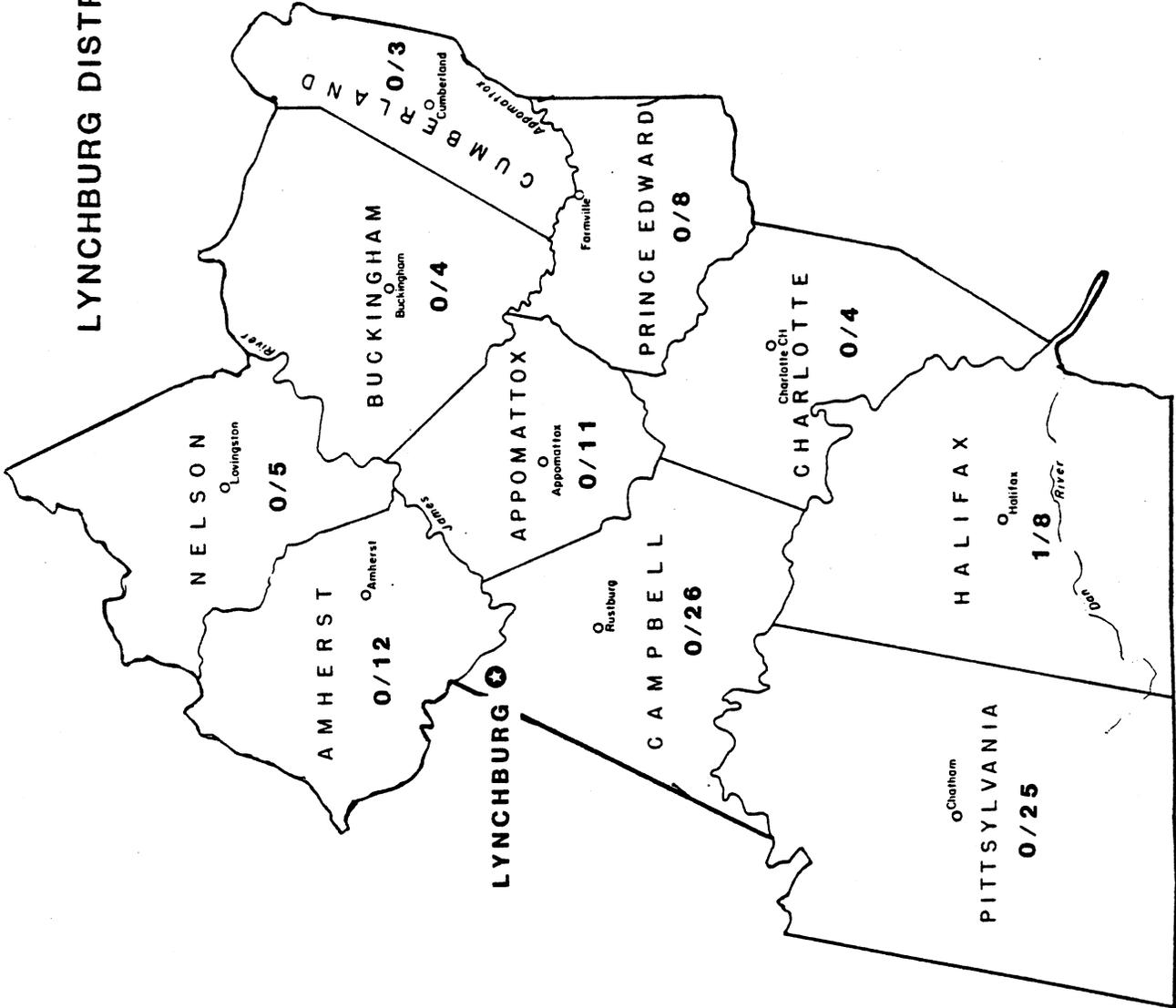


Figure A-3. Automobile Fatalities and Seat Belt Use 1982 - 1983 FARS Data
Seat Belt Users Killed/Nonusers Killed

NORTHERN VIRGINIA DISTRICT

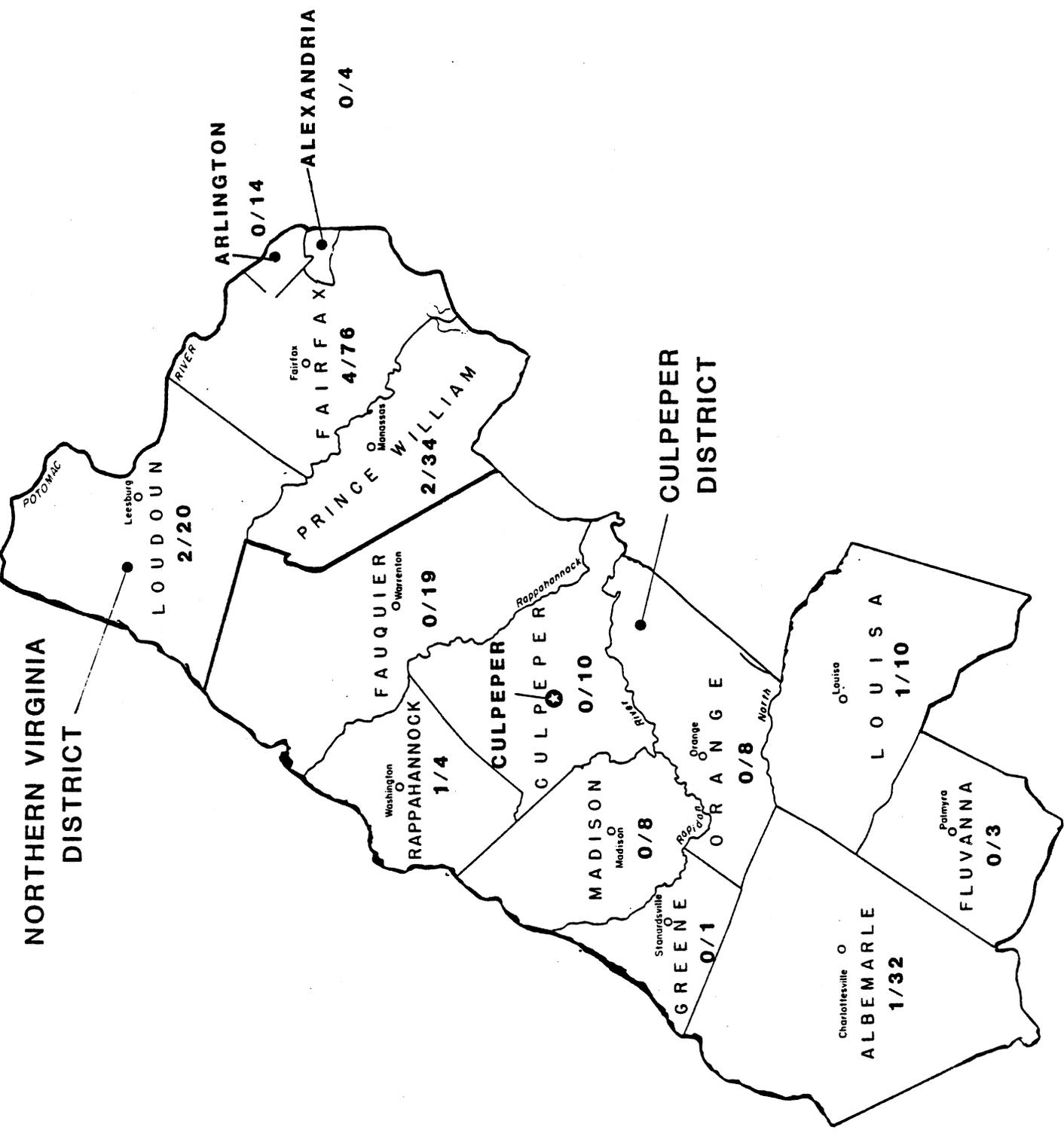
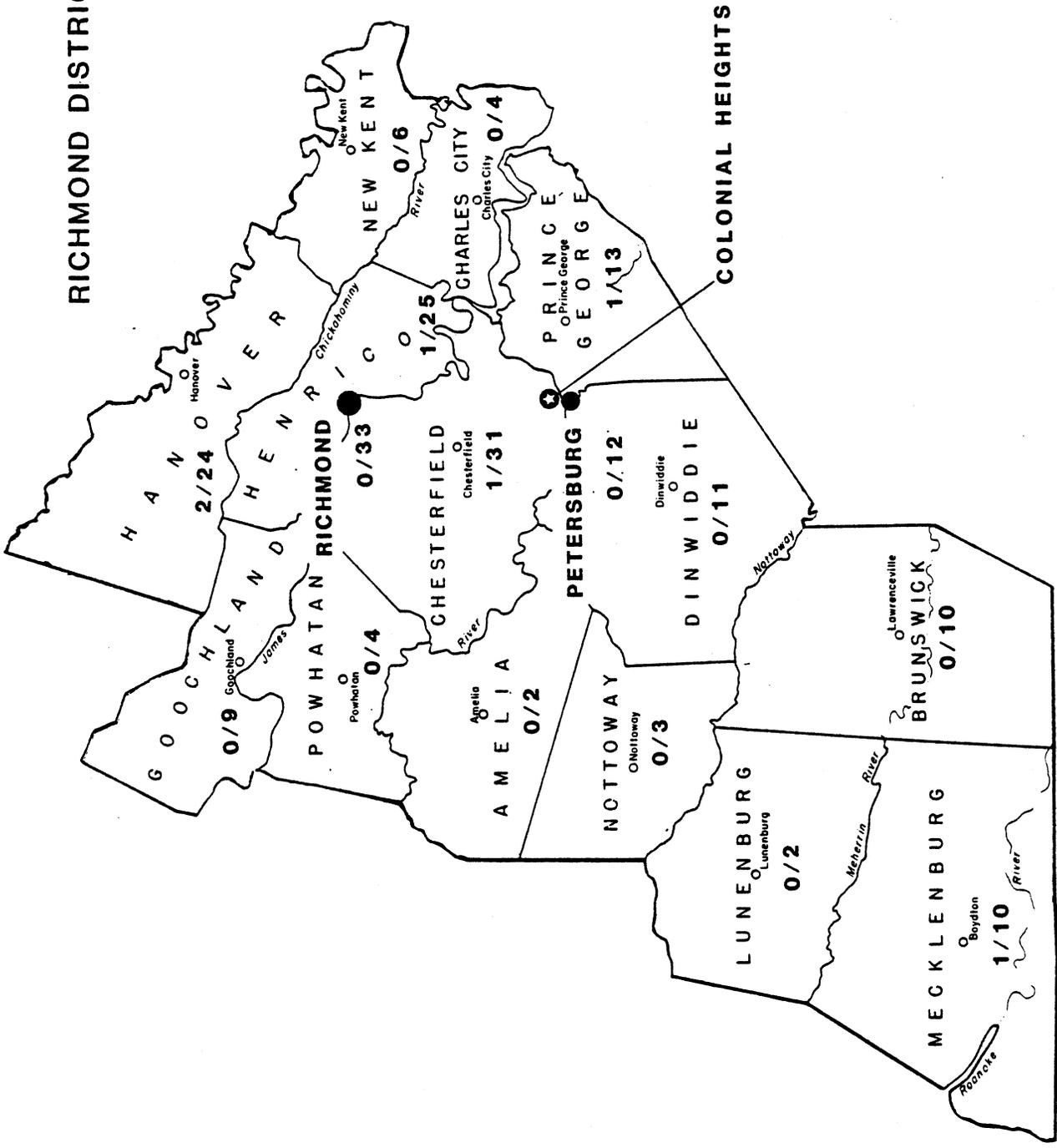


Figure A-4. Automobile Fatalities and Seat Belt Use 1982 - 1983 FARS Data
Seat Belt Users Killed/Nonusers Killed

RICHMOND DISTRICT



COLONIAL HEIGHTS

Figure A-5. Automobile Fatalities and Seat Belt Use 1982 - 1983 FARS Data
Seat Belt Users Killed/Nonusers Killed

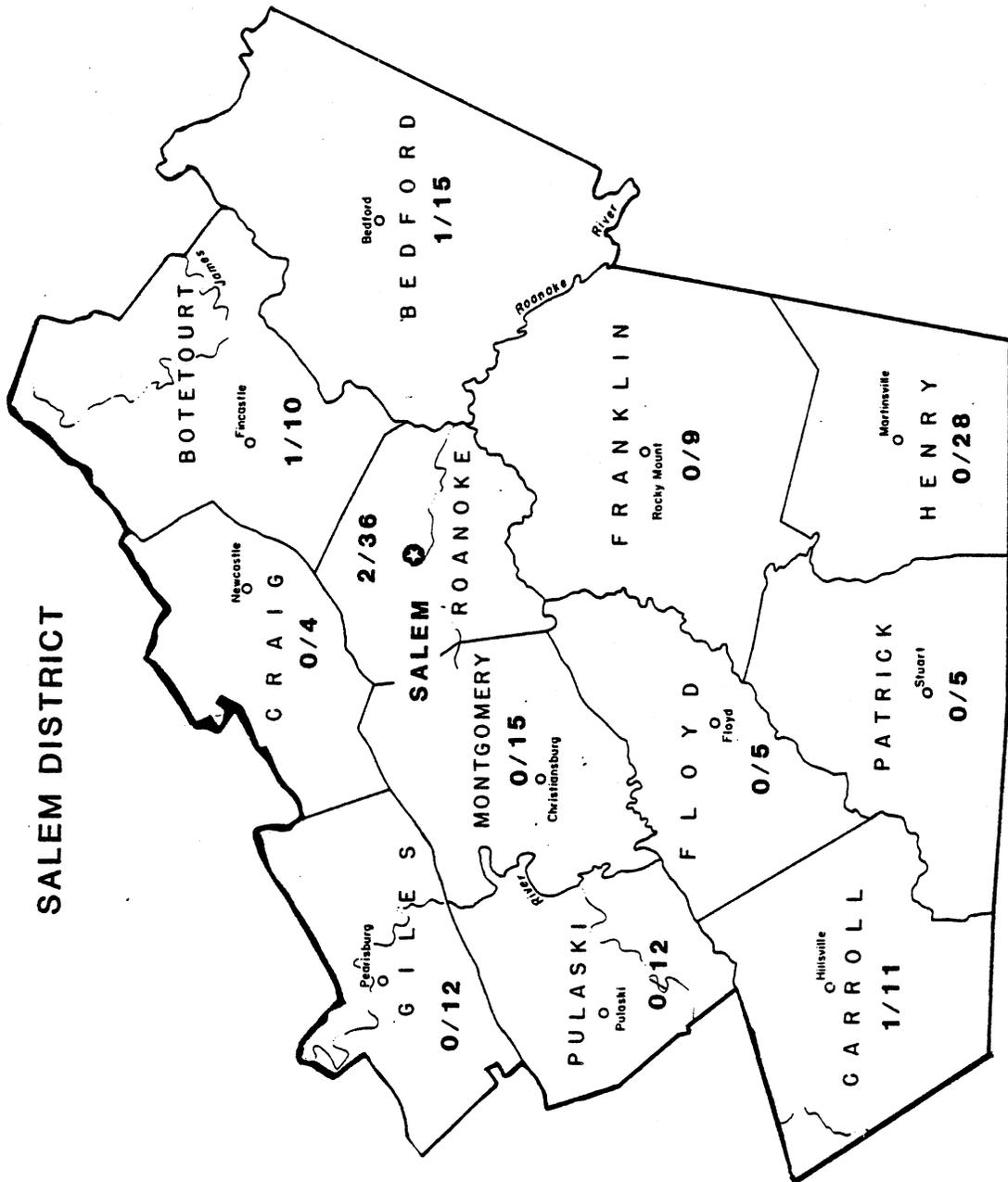


Figure A-6. Automobile Fatalities and Seat Belt Use 1982 - 1983 FARS Data
 Seat Belt Users Killed/Nonusers Killed

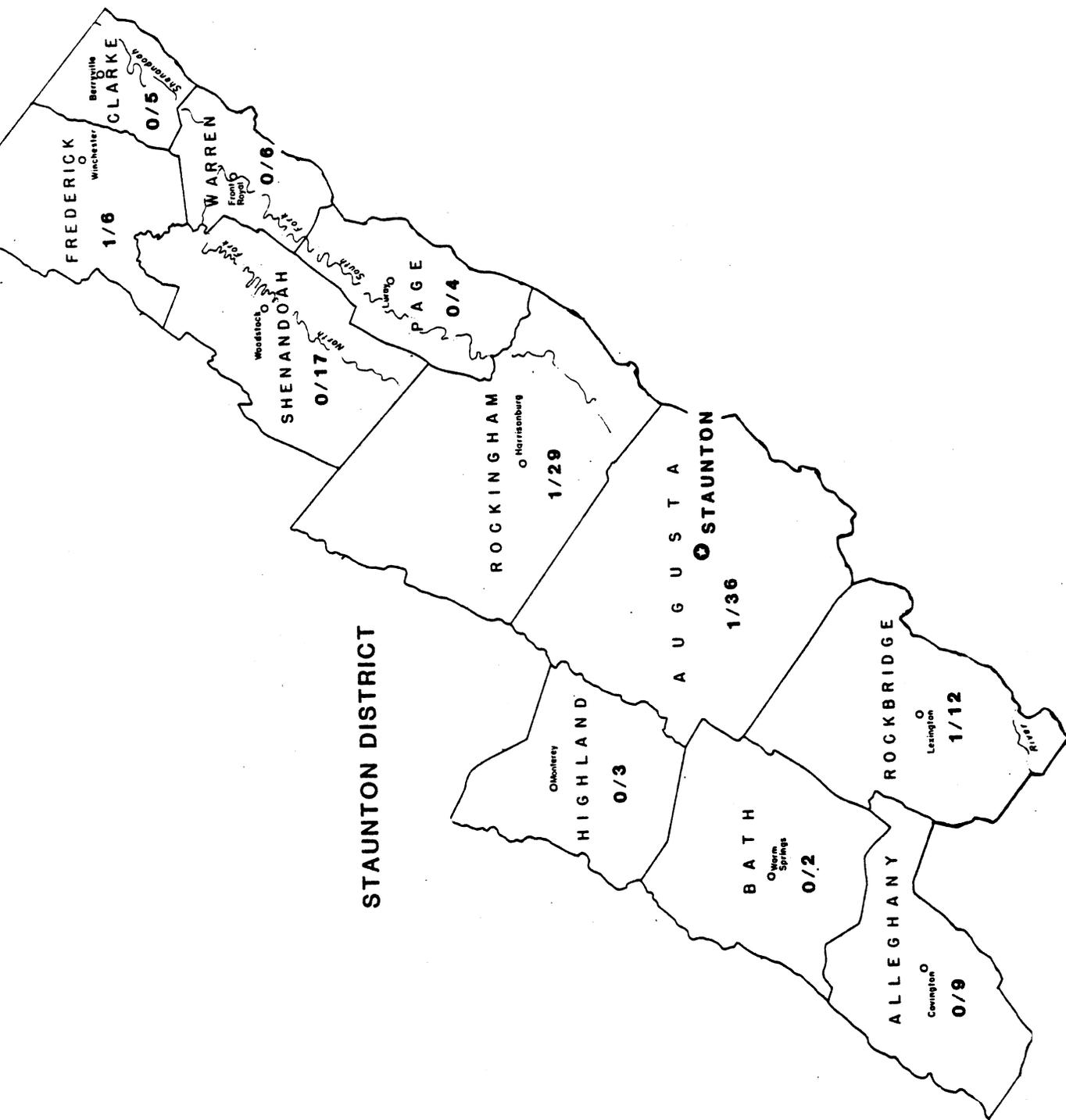


Figure A-7. Automobile Fatalities and Seat Belt Use 1982 - 1983 FARS
 Seat Belt Users Killed/Nonusers Killed

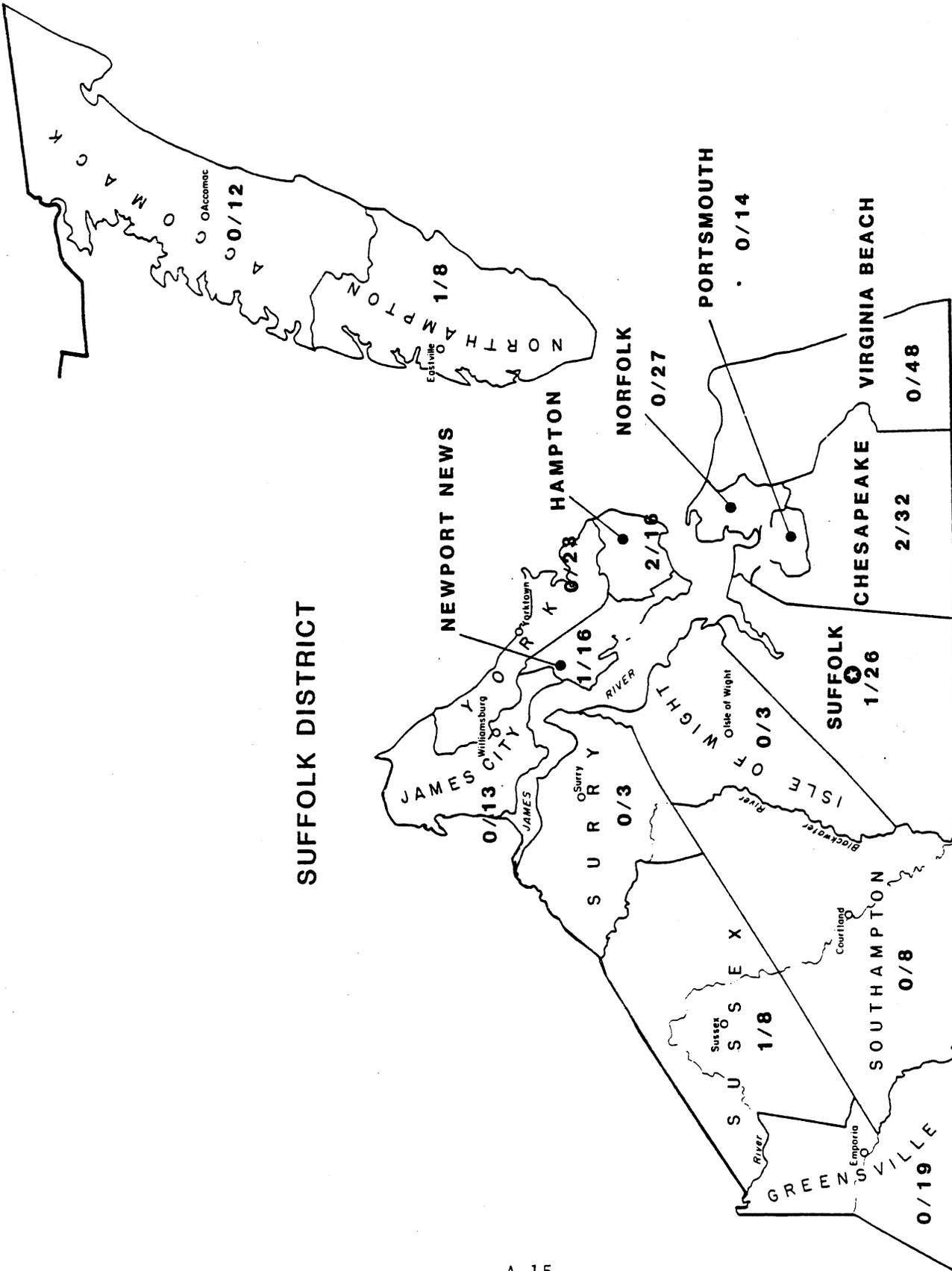


Figure A-8. Automobile Fatalities and Seat Belt Use 1982 - 1983 FARS Data
 Seat Belt Users Killed/Nonusers Killed

