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Abstract

The Virginia Transportation Research Council was requested by the Virginia Department of Motor Vehicles to estimate the changes in statewide safety belt use that would occur if the state were to modify its current mandatory use law (MUL) to permit primary enforcement. In carrying out the project, a literature review and a review of all state MUL statutes were conducted. In addition, three sources of data (two national and one state) were used to identify whether there were variations in the rates of safety belt use and the factors influencing any differences found. Several factors relevant to safety belt use were identified. Thirty-seven states and the District of Columbia have an MUL, and 9 provide for primary enforcement. It was found that belt use was generally greater in states with primary enforcement. In addition, belt use was higher in localities with both an active public information campaign and an active enforcement effort. Finally, there was a large increase in belt use by front seat occupants in Virginia after passage of the MUL, whereas belt use by rear seat occupants dropped dramatically during the same period. It was concluded that either of two actions would result in a 6 to 8 percentage point increase in the statewide belt use rate. These two actions are (1) modify the current MUL to provide for primary enforcement, or (2) amend the current MUL to apply to both front and rear seat occupants. Either change would result in a rise to a rate of approximately 62% from the current rate of 54%.

FINAL REPORT

ESTIMATED SAFETY BELT USE RATES UNDER PRIMARY AND SECONDARY ENFORCEMENT STATUTES

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

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

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ABSTRACT

The Virginia Transportation Research Council received a request from the Virginia Department of Motor Vehicles to estimate the changes that would occur in Virginia's safety belt use rates if the state were to modify its mandatory use law (MUL) to permit primary enforcement. Virginia's law permits only secondary enforcement (that is, a police officer may issue a citation for failure to use a safety belt only when a motorist is stopped for another offense).

In carrying out this request, a review of the literature was conducted to determine whether changes in safety belt use rates might have been the result of better public information and education (PI&E) campaigns or more active enforcement. In addition, a review of all state MULs was conducted to determine the differences in their provisions. Data from the National Highway Traffic Safety Administration's (NHTSA) *Federal 19-City Surveys* of safety belt use and its summaries of *Observed Safety Belt Use Statistics by State* were used to determine whether safety belt use rates are higher in states with primary enforcement than in states with secondary enforcement. Finally, data from the series of observational surveys conducted in Virginia were used to show changes in urban and statewide belt use rates subsequent to passage of the MUL.

The literature review identified several factors relevant to safety belt use. The general trend was for safety belt use to increase immediately after the effective date of the MUL, continue to rise to a peak rate, and then decline but remain at a level substantially greater than that prior to the passage of the MUL. In addition, localities with a higher use rate had *both* more active enforcement and better PI&E campaigns; enforcement without PI&E campaigns, or PI&E campaigns without a well-enforced law, did not lead to a high rate of use. Studies that distinguished between primary and secondary enforcement tended to support the superior efficacy of primary enforcement. These studies concluded that there is a relationship between enforcement levels and safety belt use rates: the more strict and more frequent the enforcement activity, the higher the use rate. In addition, it was found that, at any given level of enforcement, the rate of use was higher in states with primary enforcement than in states with secondary enforcement. Research also suggested that the effectiveness of primary enforcement procedures can be increased by implementing them them in phases. A two-step implementation process, i.e., the use of warning citations prior to the beginning of strict enforcement, resulted in a higher use rate in the long run.

A review of all state MULs showed that all states with primary enforcement require only the front seat occupants to use a safety belt whereas 7 of the 29 states with secondary enforcement require both front and rear seat occupants to use a safety belt. When the amount of the fine for violating the MUL is considered, most states have a $25 maximum, but 3 of the 4 that have a $50 maximum are primary enforcement states. Besides being more likely to have a higher fine, primary enforcement states are less likely to forbid by statute the assessment of points for a violation of their MUL. The majority of states require that PI&E efforts be con-

ducted; three-fourths of the primary enforcement states and two-thirds of the secondary enforcement states require these efforts. Only about one-fourth of the states have a requirement in their MUL for an evaluation to assess the effectiveness of the law on safety belt use.

The analysis of data from both NHTSA sources showed that use is higher in states with primary enforcement. The current rate of safety belt use in Virginia is similar to rates in other jurisdictions with secondary enforcement. If it is assumed that Virginians would have a safety belt use rate under a primary enforcement law similar to the rates in other states with primary enforcement, then the statewide safety belt use rate would be expected to increase 6 to 8 percentage points. Thus, if only a change from secondary to primary enforcement were made, it is estimated that safety belt use in Virginia would increase from the current rate of 54% to a rate between 60% and 62%.

The analysis of Virginia's observational data showed that, in the period prior to passage of the MUL, use rates for front and rear seat occupants were nearly the same. Since passage of the MUL, there was an increase in safety belt use by front seat occupants and a large decline in use by rear seat occupants. In 1990, this difference was in excess of 30 percentage points. If the MUL were amended to apply to both front and rear seat occupants, it is estimated that this change would result in a 6 to 8 percentage point increase in the statewide belt use rate.

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INTRODUCTION

Previous research has thoroughly documented that the use of safety belts by automobile occupants reduces injuries and saves lives. Since 1984, 40 states and the District of Columbia have adopted legislation mandating the use of safety belts. Three of these states (Massachusetts, Nebraska, and North Dakota) have rescinded their mandatory use law (MUL). Of the 38 laws that remain in effect, 9 permit primary enforcement; that is, they allow a police officer to stop a motorist solely for a violation of the MUL. The other 29 laws permit only secondary enforcement; that is, they allow a police officer to address an MUL violation only when the motorist has been stopped for some other offense.

Virginia is one of the states that permit only secondary enforcement of its safety belt law. However, Virginia's law mandating the use of child safety seats has a primary enforcement provision. Although Virginia requires the use of a safety device by all front seat occupants and all occupants under the age of 4 or weighing less than 40 pounds, the statewide use rate barely exceeded 50% in the most recent survey (June 1990). State safety officials and other interested groups believe that this level of safety belt use is too low and seek methods of increasing it.

One method of increasing the use rate would be to amend the safety belt law to allow for primary enforcement. The possibility of effecting an increase through such a change is suggested by two facts. First, Virginia's child safety seat law, which permits primary enforcement, has resulted in a use rate close to 66% (Stoke, 1989). Second, most of the states that have primary enforcement have achieved a higher use rate than those that permit only secondary enforcement.

However, the wide variation among states in the baseline use rates (the percentage of the state population wearing safety belts prior to the passage of the MUL) suggests that there may be no causal connection between a high use rate and primary enforcement. Likewise, it is possible that there is no causal link between primary enforcement and a high rate of child restraint usage. Among the other factors that might explain the different rates of safety belt and child restraint use is the difference in the enforcement and publicity efforts made by the states and individual communities and the magnitude of the fines imposed.

PURPOSE

The purpose of this study was to review the data available concerning safety belt use rates and to estimate what changes might occur if Virginia modified its current MUL to provide for primary enforcement.

METHOD

A review of the literature was conducted to determine whether changes in safety belt use rates resulted from changes in law, PI&E campaigns, or enforcement levels. In addition, all state MUL statutes were reviewed to identify any differences in their provisions. Three sources of data were used to ascertain changes in safety belt use patterns as a result of the enactment of MULs. Data from the National Highway Traffic Safety Administration's (NHTSA) *Federal 19-City Surveys* of safety belt use (Appendix A) and from the NHTSA's summaries of *Observed Safety Belt Use Statistics by State* (Appendix B) were used to determine whether the rates of safety belt use in states with primary enforcement are different than those in states with secondary enforcement. Data from the longitudinal observational surveys in Virginia (Stoke, 1989) were used to show changes in safety belt use rates in urban areas for a 6-year period; 3 years prior and 3 years subsequent to the effective date of the state law (January 1, 1988). Statewide safety belt use rates, which were available for only a 4-year period (the year prior to the MUL and for 3 years after) were also used to track changes in the safety belt–wearing habits of Virginia residents.

RESULTS

Literature Review

Because experience with MULs is limited to the second half of the last decade, the literature comparing safety belt use under primary and secondary enforcement procedures is limited. The studies that do exist, however, provide important insights.

The general change in the pattern of safety belt use in states that have enacted an MUL is for the rate to increase immediately after the effective date of the law, continue to rise to a peak rate, and then decline but remain at a level substantially greater than that prior to passage of the statute.

Early assessments of the reductions in fatalities following the implementation of MULs have reported poor results. In effect, the reductions have been small

or nonexistent. One explanation, supported by the data, is that high-risk drivers, those most likely to be involved in crashes, are the least likely to wear a safety belt. Preusser, Lund, Williams, and Blomberg (1988) reported that these high-risk drivers are not as responsive to MULs as are other segments of the driving population. Drivers who are young, who have been drinking, and who drive the fastest are statistically underrepresented among safety belt users.

In NHTSA's *Third Annual Report to Congress* (Smith, 1990), it is stated that well-publicized enforcement of the law is the key to greater safety belt use. The report further stated that localities with higher use rates have had more active enforcement and better PI&E campaigns; enforcement without PI&E, or PI&E without a well-enforced law, will not achieve high rates of use. During 1990, NHTSA funded 28 community programs to increase safety belt use. Four of the 6 that had either enforcement or PI&E campaigns, but not both, reported reduced or unchanged use. Seventeen of the 22 communities with both types of activities reported an increase in safety belt use.

Those studies that distinguished between primary and secondary enforcement tended to support the superior efficacy of primary enforcement (Campbell, 1987; Campbell, Stewart, & Campbell, 1987; Campbell, Stewart, & Campbell, 1988). These studies compared the use rate in states with different levels of enforcement (measured in terms of citations for violation of the safety belt use law) and concluded that there is a relationship between higher enforcement levels and higher use rates. These studies also reported that, at any given level of enforcement, the rate of use was higher in states with primary enforcement than in states without primary enforcement. In addition, the difference between the level of safety belt use in primary enforcement states and secondary enforcement states, at the same level of enforcement activity, could be as great as 17 percentage points (Campbell, 1987). The magnitude of the difference depended on the prelaw level of use in each of the two groups—a large difference when baseline use was low and a smaller difference when baseline use was high.

In assessing the efficacy of primary enforcement, it is important to note the extent to which other factors play a role in safety belt use. Several studies noted that the perception of enforcement may be at least as significant as the actual means and level of enforcement. Lund, Pollner, and Williams (1987) concluded that primary enforcement and stiff penalties must be well publicized in order to be effective in increasing safety belt use. They suggested that the PI&E campaigns should be aimed at creating public support for the policy, not just awareness of the penalties.

As important as public support is, other studies highlight the need to develop support among law enforcement officers. Even in states that permit primary enforcement, some officers will not stop motorists solely on the basis of a safety belt violation (Reinfurt, Campbell, Stewart, & Stutts, 1988). Some local police departments discourage their officers from issuing safety belt citations because the departments must pay overtime for the court time involved for the officers (Reinfurt et al., 1988). Some law enforcement officers have the opinion that warning citations may

be more appropriate and more effective than stiff penalties. This belief causes some officers to be reluctant to issue a citation for an MUL violation (Hunter, Stutts, Stewart, & Rodgman, 1988).

Campbell et al. (1988) suggested that the effectiveness of primary enforcement procedures can be increased by implementing the procedures in phases. Many states have allowed a grace period between the effective date of an MUL and the beginning of enforcement. Sometimes, warning citations are issued in the interim. Data show that this two-step implementation process results in a higher use rate in the long run. The figures show an increase in safety belt use when the law becomes effective and a second increase, sometimes quite steep, when fines begin to be assessed. Researchers have hypothesized that this results from the increase in the time the issue is before the public.

This phenomenon raises the interesting possibility that, by moving from a secondary enforcement regime to a primary enforcement regime, Virginia might experience a similar second increase in the level of safety belt use.

Review of State Statutes

In assessing the relative merits of primary and secondary enforcement, it is necessary to consider other factors that might affect use rates. Tables 1 and 2 provide information about the various laws in existence, with special attention being given to factors with the potential to affect safety belt use rates. These factors include whether the law requires only front or both front and rear seat occupants to use belts; the amount of the fine; whether the law specifically forbids the accrual of points for violations; whether the law provides for efforts to educate the public about the law and the benefits of belt use; and whether the law provides for an evaluation of its effectiveness.

Table 1
Characteristics of MULs with a Primary Enforcement Provision

State	Applies to Front/Rear	Fine Amount ($)	Assessment of Points Forbidden by Law	Education Required by Law	Evaluation Required by Law
Connecticut	F	15	Y[1]	N	N
Hawaii	F	20	Y	N	N
Iowa	F	10	N	Y	N
Mississippi	F	0	Y	Y	N
New Mexico	F	25–50	N	Y	Y
New York	F	50	N	Y	N
North Carolina	F	25	Y	Y	Y
Oregon[2]	—	—	—	—	—
Texas	F	25–50	N	Y	N

[1]Y = yes; N = no.
[2]New law; data not yet available.

Table 2
Characteristics of MULs with a Secondary Enforcement Provision

State	Applies to Front/Rear	Fine Amount ($)	Assessment of Points Forbidden by Law	Education Required by Law	Evaluation Required by Law
Alaska	F/R	15	Y[1]	N	N
Arizona[2]	F	10/25[3]	Y	Y	N
California	F/R	20/50	Y	N	N
Colorado	F	11	Y	Y	N
D.C.	F	15	Y	Y	N
Florida	F	20	N	Y	N
Georgia	F	15	Y	N	N
Idaho	F	5	Y	Y	N
Illinois	F	25	N	N	N
Indiana	F	25	Y	Y	Y
Kansas	F	10	N	Y	Y
Louisiana	F	25	N	Y	N
Maryland	F	25	Y	Y	Y
Michigan	F	25	Y	Y	N
Minnesota	F	10	Y	N	N
Missouri	F	10	Y	Y	Y
Montana	F/R	20	Y	Y	N
Nevada	F/R	25	Y	N	Y
New Jersey	F	20	Y	Y	N
Ohio	F	10/30	Y	Y	N
Oklahoma	F	25	N	Y	Y
Pennsylvania	F	10	Y	Y	N
S. Carolina[4]	—	—	—	—	—
Tennessee	F/R	25	Y	Y	N
Utah	F	10	Y	N	N
Virginia	F	25	Y	N	N
Washington	F/R	*	Y	Y	N
Wisconsin	F/R	10	N	Y	N
Wyoming	F	**	Y	N	N

[1]Y = yes; N = no.
[2]Arizona's law will be automatically repealed in January of 1993 if use rates are not significantly higher.
[3]Fine amounts separated by a slash represent the amounts for first and subsequent offenses, respectively.
[4]Not available.
* Set by rule of the court.
**No fine, but the fine for the primary offense is reduced by $5 if the driver was wearing a belt.

These data show that all states with primary enforcement require only front seat occupants to use a safety belt, whereas 7 states that have secondary enforcement require both front and rear seat occupants to use a safety belt. There is a significant variation in the amount of the fine imposed for violating an MUL. Although most states have a $25 maximum, it is notable that 3 of the 4 states allowing fines up to $50 are primary enforcement states.

Besides being more likely to have higher fines, primary enforcement states are less likely to forbid by statute the assessment of points for a violation. Fifty

percent of the states with primary enforcement forbid the assessment of points, and 75% of the states with secondary enforcement forbid the assessment of points.

Seventy-five percent of the states with primary enforcement require public education efforts. Slightly less than 67% of the states with secondary enforcement require public education efforts. Only about 25% of states in either category have a requirement in their statute for periodic evaluation to assess the effect of the law on safety belt use.

Federal 19-City Surveys

In 1978, the NHTSA began a long-term survey of safety belt use by drivers in 19 cities (see Table 3). The NHTSA prepared a table of safety belt use rates for the period January 1985 through December 1989 (see Appendix A). These data were used to prepare Table 4, which summarizes the range of rates in each city for the period since January 1987. The data are categorized into four groups: cities without an MUL (N), cities with primary enforcement (P), cities with secondary enforcement (S), and cities that had an MUL that was rescinded (R).

There are a number of factors that might influence the use rate in each city and thus prevent the computation of a simple group average rate. Among these factors are those associated with the absence of data showing the number of vehicles observed and the number of drivers using safety belts in each city. In addition, the data do not account for variations in pre-MUL use rates among the various cities. Although as few as 19 cities could represent a statistically valid sample, a subcategorization into groups may not provide a statistically representative sample for each group. Finally, no accounting was made for variations in enforcement or publicity in the cities.

Although there is considerable variability in the upper and lower limits of use among the 19 communities, generally, the data show that driver use rates are lowest in cities where an MUL was not in effect and are highest in cities where

Table 3
Cities in NHTSA Survey

City	Type MUL	City	Type MUL
Atlanta	S[1]	Minneapolis/St. Paul	S
Baltimore	S	New Orleans	S
Birmingham	N	New York	P
Boston	R	Phoenix	S
Chicago	S	Pittsburgh	S
Dallas	P	Providence	N
Fargo/Moorhead	R	San Diego	S
Houston	P	San Francisco	S
Los Angeles	S	Seattle	S
Miami	S		

[1]S = secondary enforcement; N = no MUL; R = MUL was rescinded; P = primary enforcement.

Table 4
Driver Use Rates—NHTSA 19-City Survey

Cities	Range of Rates (1/87–12/89)
No-MUL Cities	
Birmingham	23.6 (06/87)–39.8 (01/88)
Boston (R)[1]	22.3 (01/88)–37.6 (10/88)
Fargo/Moorhead (R)	19.1 (06/87)–39.2 (12/88)
Providence	11.9 (01/88)–25.4 (12/89)
Primary Enforcement Cities	
Dallas	60.0 (08/88)–71.6 (12/89)
Houston	51.9 (06/87)–68.9 (01/88)
New York	21.9 (10/87)–29.6 (12/89)
Secondary Enforcement Cities	
Atlanta	31.7 (10/88)–50.8 (12/89)
Baltimore	41.5 (01/88)–54.5 (06/87)
Chicago	23.4 (01/88)–41.3 (12/89)
Los Angeles	43.0 (08/87)–52.7 (10/88)
Miami	38.8 (12/89)–71.0 (06/87)
Minneapolis/St. Paul	46.7 (01/88)–67.5 (10/88)
New Orleans	30.2 (06/87)–43.3 (05/88)
Phoenix	38.7 (08/87)–54.4 (12/88)
Pittsburgh	28.1 (05/88)–54.6 (12/88)
San Diego	49.0 (12/89)–59.4 (05/88)
San Francisco	50.8 (10/87)–58.4 (12/89)
Seattle	59.9 (10/87)–62.7 (12/88)
Total Cities	41.2 (01/88)–48.3 (12/88)
MUL Cities	48.3 (05/88)–52.2 (12/88)
No-MUL Cities	27.1 (06/87)–37.1 (12/88)

[1]R = law rescinded.

primary enforcement was in operation. The use rates in cities with secondary enforcement are similar to the rates in the urban areas of Virginia; upper limit rates ranging from mid-40% to upper 60%.

It is assumed that, if Virginia had primary enforcement applicable to front seat occupants, Virginia drivers would use safety belts at a rate similar to those for drivers in the three NHTSA survey cities that have primary enforcement. This seems to be a reasonable assumption since urban driver use rates in Virginia are currently similar to urban driver use rates for the NHTSA survey cities with secondary enforcement. If the assumed change in use occurred, then, based on the NHTSA figures, there should be an increase in safety belt use in Virginia's urban areas of 6 to 8 percentage points. A change of this magnitude is estimated to result in an increase of approximately 6 percentage points in the statewide rate. Further, it is expected that primary enforcement would result in an increase in safety belt use in the nonurban areas of 6 to 8 percentage points. A change of this magnitude

is projected to result in an increase of approximately 2 percentage points in the statewide rate. The combined increase would result in an 8-point increase in the statewide rate.

The enactment of an MUL with a primary enforcement provision applicable only to front seat occupants (those covered by the current Virginia statute) is expected to result in an increase in safety belt use in the urban areas of Virginia from the current rate of nearly 58% to a rate of 64% to 66%. In addition, safety belt use in the nonurban areas of the state is expected to increase from nearly 44% to from 50% to 52%. The combined effect of these two increases would be a rise in statewide use from the current rate of 54% to a rate of nearly 62%.

Safety Belt Use Rates in States with an MUL

The NHTSA serves as a clearinghouse for the dissemination of data on safety belt use collected by the states. It publishes semiannual reports on *Observed Safety Belt Use Statistics by State* (see Appendix B). These reports include safety belt use rates, by state, prior to the effective date of the MUL and the lowest, highest, and most recent rates subsequent to the implementation of the law.

The safety belt use data provided by the states are collected during different times of the year using survey procedures that vary from state to state. In addition, these data do not account for differences in enforcement and PI&E efforts among the states. The effects of enforcement and PI&E efforts have been shown to influence safety belt use rates greatly. For these reasons, the use rates are not strictly comparable from state to state. Although not all state rates are strictly comparable, the data can be discussed comparing Virginia's rate of use as a function of the relative rank order of all state rates. This would show whether Virginia's rate is above, below, or similar to the rates of other states.

As of December 1990, 9 states had an MUL with a primary enforcement provision and 28 states and the District of Columbia had an MUL with a secondary enforcement provision. When the safety belt use data collected in Virginia are compared with those reported by other states that have secondary enforcement, several broad generalizations can be made (see Table 5). For data obtained prior to the implementation of a state's MUL, the belt use rate in Virginia (32.5%) was higher than that in all other states, with the exception of Alaska and Montana. This high prelaw rate is most likely due to the fact that it took several years to get an MUL enacted in Virginia, and with the accompanying publicity associated with the efforts, state residents gradually changed their use habits. This scenario is verified by the Virginia belt use data collected from 1983 through 1987 (Stoke, 1989).

When considering the low, high, and most recent post-MUL rates, the rate of safety belt use in Virginia was one of the highest of all the states with a secondary enforcement provision. The lowest postlaw rate in Virginia (51.1%) was higher than the lowest rate observed in every state that has data except for Maryland. When peak safety belt use rates are considered, the peak in Virginia (63.1%) was higher

than that of all the other states with secondary enforcement, with the exception of California, Maryland, and Montana. When the most recent safety belt use rates are considered, the rate in Virginia (54.2%) is higher than that for the other states with a similar MUL, with the exception of California, Florida, Maryland, Montana, and Washington. In fact, only the current rates in California, Maryland, and Montana are higher than the current rate in Virginia. These data show that use rates in Virginia are in the upper range of rates among all the states with secondary enforcement; Virginia is one of the top 3 or 4 states in safety belt use among these states.

Virginia safety belt use data are also compared with use rates reported by states with primary enforcement (see Table 6). The pre-MUL safety belt use rate in Virginia (32.5%) was greater than that in all the primary enforcement states except Hawaii. In the postlaw period, the lowest rate for Virginia (51.1%) was higher than the lowest rates in the primary enforcement states with the exception of Hawaii and Texas. The peak rate in Virginia (63.1%) exceeded the peak rate only for

Table 5
Rates of Safety Belt Use in States with Secondary Enforcement

State	Pre-MUL Rate	Post-MUL Rate		
		Low	High	Recent
Alaska	45.0	N/A[1]	N/A	N/A
Arizona	N/A	N/A	N/A	N/A
California	25.8	45.3	67.8	67.8
Colorado	18.0	47.0	51.0	47.0
D.C.	N/A	30.0	55.0	48.7
Florida	28.1	40.8	60.5	55.2
Georgia	27.8	38.8	41.0	41.0
Idaho	15.6	21.3	36.1	36.1
Illinois	15.9	27.6	47.0	40.5
Indiana	9.5	42.6	52.0	47.4
Kansas	10.7	23.2	52.0	52.0
Louisiana	12.0	35.0	40.6	38.8
Maryland	28.0	60.0	73.5	67.0
Michigan	25.8	43.0	58.4	50.5
Minnesota	19.8	32.0	46.7	44.1
Missouri	12.2	19.2	54.1	54.0
Montana	33.0	46.0	63.6	63.6
Nevada	21.1	38.4	42.1	38.4
New Jersey	18.2	35.1	44.1	44.1
Ohio	28.0	33.4	48.2	44.4
Oklahoma	15.7	30.5	41.0	37.0
Pennsylvania	N/A	43.9	49.5	49.5
South Carolina	N/A	37.9	37.9	37.9
Tennessee	N/A	19.2	43.0	43.0
Utah	17.7	22.1	44.2	44.2
Virginia	**32.5**	**51.1**	**63.1**	**54.2**
Washington	N/A	36.0	55.4	55.4
Wisconsin	26.2	48.7	56.0	52.0
Wyoming	N/A	N/A	N/A	N/A

[1]N/A = Not available.

Table 6
Rates of Safety Belt Use in States with Primary Enforcement

State	Pre-MUL Rate	Post-MUL Rate		
		Low	High	Recent
Connecticut	25.0	46.1	58.5	58.5
Hawaii	33.0	63.5	80.5	80.5
Iowa	27.4	46.0	63.0	59.0
Mississippi	18.6	N/A[1]	N/A	N/A
New Mexico	28.2	42.7	64.7	58.7
New York	15.9	45.9	64.0	60.0
North Carolina	24.1	38.9	75.8	62.0
Oregon	N/A	N/A	N/A	N/A
Texas	13.3	54.1	67.6	67.6

[1]N/A = Not available.

Connecticut. The most recent rate in Virginia (54.2%) was lower than the most recent rates in all 8 primary enforcement states that reported use rates.

Although belt use rates in Virginia were higher than those in nearly all states with secondary enforcement, the peak and recent use rates were below those for states with primary enforcement. Recent rates in primary enforcement states vary from 58.5% to 80.5%, with 5 states reporting a rate around 60%, 1 state reporting a rate of nearly 68%, and 1 state reporting a rate just over 80%. If it is assumed that Virginia residents would increase their safety belt use upon passage of an MUL with a primary enforcement provision and that the new use rate would be similar to the rates of use in the majority of the states with such a statute, then it would be expected that the statewide belt use rate in Virginia would increase to a rate between 58% and 62%.

Use Rates in Virginia

Safety belt use rates in urban areas of the state are shown in Table 7. In 1985 and 1986, there was virtually no difference in rates of use by occupants of the front and rear seats of automobiles. However, the 1987 survey, which was conducted prior to the effective date of the MUL but after the legislature had passed the bill and the governor had signed it, showed that a smaller percentage of rear seat occupants used belts than did those in the front seats. Both the print and electronic media had given the law much publicity in its progress through the legislature. It is possible that state residents had begun to change their safety belt use habits by the time the 1987 survey was conducted. In each of the surveys after the effective date of the law, the use rates for front seat occupants were significantly higher. These differences were 32.2 percentage points in 1988, 29.9 points in 1989, and 32.4 points in 1990. Each year in the post-MUL period, the belt use rate for front seat occupants was at least double that for rear seat occupants.

When the urban data are considered over time rather than by differences during each year data were collected, a significant use pattern emerges. In the 3-year pre-MUL period, front seat belt use increased from 27.5% in 1985 to 39.3% in 1987. After the effective date of the MUL, there was a sharp increase in use to 66.9%. In the past 2 years, use rates by urban front seat occupants were 58.9% (1989) and 60.4% (1990); these rates are below the 1988 peak, but they are much higher than the rates in the pre-MUL period.

Safety belt use by back seat occupants rose from 27.4% in 1985 to 34.8% in 1986, then dropped to 29.1% in 1987. In 1988, urban area back seat belt use was 34.7%, a rate the same as that in 1986. In 1989, back seat belt use had dropped to 29.0%, and the rate dropped to 28.0% in 1990, rates lower than those in 1986 and 1987 prior to passage of Virginia's MUL.

Statewide safety belt use rates are shown in Table 8. Statewide data are available for only 1 year prior to the passage of the MUL (1987) and for 3 years after (1988, 1989, and 1990). The statewide front seat use rates followed the same pattern as that for urban occupants—a sharp increase in usage in 1988, followed by a modest drop in 1989 and 1990. Front seat belt use rose from 33.3% in 1987 to 63.4% in 1988. In 1989 and 1990, the front seat rates were 55.7% and 57.2%; these rates were lower than the peak but much higher than the pre-MUL rate. There was a minimal increase in belt usage by rear seat occupants between 1987 and 1988; the rate rose from 27.3% to 29.9%. Over the three post-MUL surveys, rear seat belt use dropped to 25.8% in 1989 and to 25.3% in 1990; these rates are lower than those in the pre-MUL period.

From these data, two things are clearly shown: (1) rear seat occupants are using safety belts at a rate much lower than that of front seat occupants, and in the past 2 years, the rate has declined to less than 50% of that for the front seat; and (2) since passage of the MUL, belt use by front seat occupants has risen whereas that

Table 7
Rates of Safety Belt Use in Urban Areas

	Pre-MUL			Post-MUL		
Seats	1985	1986	1987	1988	1989	1990
Front	27.5	34.8	39.3	66.9	58.9	60.4
Back	27.4	34.8	29.1	34.7	29.0	28.0

Table 8
Rates of Safety Belt Use Statewide

	Pre-MUL	Post-MUL		
Seats	1987	1988	1989	1990
Front	33.3	63.4	55.7	57.2
Back	27.3	29.9	25.8	25.3

for rear seat occupants has declined to a rate below that in the pre-MUL period. For some reason, after passage of the MUL, rear seat belt use declined.

One option available to the state to increase safety belt use is to amend the current MUL to apply to both front and rear seat occupants. If safety belt use by all occupants in the vehicle follows the same pattern as that for front seat occupants, the statewide belt use rate might increase by 6 to 8 percentage points. A change of this magnitude would result in a statewide belt use rate of from 60% to 62%, up from the current 54%.

FINDINGS

The major findings of this study were as follows:

1. Thirty-seven states and the District of Columbia have an MUL; 29 provide for secondary enforcement.
2. After passage of an MUL, there is a sharp increase in safety belt use.
3. Six to 12 months after the effective date of an MUL, safety belt use falls below the peak rate but remains higher than prelaw rates.
4. Safety belt use is higher in localities that have *both* an active PI&E campaign and increased enforcement activities.
5. Only 8 states have a provision requiring their MUL to be evaluated (2 are primary enforcement states).
6. In all states with primary enforcement, the statute applies only to front seat occupants.
7. Fines for not using a safety belt vary from $50 to the Wyoming practice of providing a $5 discount off the fine for the primary offense if the driver was using a safety belt.
8. Four of the states with primary enforcement and 22 of the states with secondary enforcement do not permit points to be assessed against the offending motorist.
9. Data from NHTSA's nationwide 19-city surveys show that use rates are higher in cities with primary enforcement than in cities with secondary enforcement.
10. Safety belt use rates in Virginia are higher than those in most other states with secondary enforcement.
11. Safety belt use rates in Virginia are lower than those in states with primary enforcement.

12. In Virginia, front seat belt use is much higher in the post-MUL period than in the pre-MUL period.

13. However, rear seat belt use in Virginia is lower in the post-MUL period than in the pre-MUL period.

14. Rear seat occupants in Virginia use a safety belt at a much lower rate than front seat occupants.

15. In Virginia, safety belt use is much higher in urban areas than in non-urban areas.

CONCLUSIONS

The state has a number of options that could result in increased safety belt use by motor vehicle occupants. Among these options are:

1. Increase the level of enforcement and PI&E efforts. These efforts must occur together. The magnitude of the change in safety belt use resulting from this option cannot be computed because it depends on the level of activity. Certain localities in other states have had an increase in safety belt use that varied from 5 to 10 percentage points.

2. Amend the present MUL to have a primary enforcement provision rather than a secondary enforcement provision. This change is projected to result in an increase in statewide safety belt use of 6 to 8 percentage points.

3. Amend the present MUL to apply to all vehicle occupants. It is projected that this action would result in an increase in statewide safety belt use of 6 to 8 percentage points.

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APPENDIX A

19-City Belt Use Rates

PERCENT DRIVER USE OF SAFETY BELTS IN 19 CITIES BY PERIOD OF OBSERVATION

CITY	1985 Jan-Jun H1-85	1985 Jul-Dec H2-85	1986 Jan-Jun H1-86	1986 Jul-Dec H2-86	1987 Mar-Jun Q2-87	1987 Jun-Aug Q3-87	1987 Aug-Oct Q3-87	1987 Nov-Jan Q4-87	1988 Feb-May Q1-88	1988 Jun-Aug Q2-88	1988 Aug-Oct Q3-88	1988 Oct-Dec Q4-88	1989 Jan-Jun H1-89	1989 Jul-Dec H2-89
Atlanta	17.3	20.5	19.7	23.8	36.8	42.0	34.4	35.2	36.4	36.5	31.7	44.8	45.1	50.8
Baltimore	20.2	16.3	28.5	60.8	54.5	47.1	47.0	41.5	46.7	50.2	50.7	52.2	48.8	47.0
Birmingham	13.5	18.5	21.1	24.0	23.6	32.7	32.9	39.8	39.5	35.1	35.2	31.0	36.8	28.4
Boston	14.3	19.1	42.3	36.1	24.9	25.9	25.2	22.3	31.2	23.9	37.6	33.0	34.7	33.0
Chicago	15.4	34.5	26.8	25.7	36.7	31.4	33.0	23.4	31.7	34.5	29.8	27.7	32.3	41.3
Dallas	18.7	25.3	70.9	67.1	60.9	67.1	64.2	67.6	71.4	60.0	67.7	69.2	67.0	71.6
Fargo/Moorhead	9.8	12.4	11.8	15.9	19.1	23.7	26.0	23.6	21.7	32.9	35.7	39.2	27.9	37.3
Houston	14.3	18.5	70.1	63.9	51.9	63.8	67.0	68.9	65.6	67.8	61.4	63.1	63.5	59.3
Los Angeles	15.6	25.2	45.2	39.1	44.4	43.0	47.3	47.3	47.3	49.2	52.7	50.8	52.3	51.9
Miami	13.4	15.4	23.7	28.8	71.0	66.0	64.1	40.6	51.9	47.1	54.6	50.4	42.7	38.8
Minneapolis/St. Paul	25.6	25.4	24.6	49.7	51.8	50.2	49.8	46.7	47.8	59.7	67.5	65.0	62.1	58.1
New Orleans	13.8	13.2	18.5	38.7	30.2	40.2	37.6	36.6	43.3	38.3	40.7	39.6	41.8	39.5
New York	53.1	40.3	25.8	35.2	24.7	29.4	21.9	24.1	24.6	28.9	28.4	27.4	25.9	29.6
Phoenix	22.8	29.0	28.7	33.7	40.1	38.7	39.7	39.6	40.6	44.1	52.7	54.4	48.6	41.0
Pittsburgh	18.9	19.9	22.7	26.2	25.5	29.0	30.5	31.5	28.1	46.1	43.9	46.5	47.8	54.6
Providence	13.5	14.3	11.8	17.2	15.0	20.8	18.1	11.9	15.4	17.6	19.9	20.5	20.5	25.4
San Diego	25.6	28.5	50.9	52.1	56.6	55.6	56.0	54.3	59.4	58.9	59.1	56.3	59.6	49.0
San Francisco	21.0	28.0	52.6	52.6	52.6	51.9	50.8	52.9	53.4	58.4	55.0	57.3	56.5	58.4
Seattle	31.3	33.8	35.2	46.5	62.7	60.0	59.9	61.0	60.3	61.4	62.4	62.7	61.0	60.6
Total	19.4	23.3	27.3	32.8	41.7	43.2	42.4	41.2	43.4	45.6	46.5	48.3	46.4	46.0
No Law Cities	18.0	21.6	23.0	23.9	27.1	30.3	29.9	30.6	31.4	32.5	36.3	37.1	34.3	32.5
Law Cities	53.1	37.4	49.0	46.0	50.6	50.5	50.3	48.3	48.3	51.0	51.1	52.2	50.4	50.3
# Cities with Law	1	2	9	13	12	12	12	12	13	13	14	14	14	14
All ASBs							90.4		87.4		86.5		85.0	
2-point Motorized							97.6		98.7		95.8		96.1	
2-point non-motorized							80.3		71.4		78.4		75.3	
Lap-Shoulder							71.9		74.5		75.4		74.3	
# ASB Cars Observed							655		2236		3378		11497	

APPENDIX B

Observed Safety Belt Use Statistics by State

NHTSA • Office of Driver and Pedestrian Research • Research & Development

OBSERVED SAFETY BELT USE STATISTICS BY STATE
October 1990

The following table shows observed safety belt use rates in states with safety belt use laws (SBULs). For each state, the first column describes whether its law provides for primary or secondary enforcement and the second column gives the law's effective date (in some states the law became effective several months before any penalties were enforced). The remaining columns give belt use rates obtained from state observation surveys and the survey dates. The "Before SBUL" column gives the rate in the last survey conducted before the law's effective date. The "After SBUL" columns give the lowest, highest, and most recent use rates after the law became effective.

All data are taken from surveys conducted by the individual states. Some of the state surveys were designed using probability sampling techniques, so that the use rates in those states are statistically valid state estimates.

OBSERVED SAFETY BELT USE STATISTICS BY STATE
FOR STATES WITH SAFETY BELT USE LAWS
(PERCENTAGE/SURVEY DATE)

State	Primary --- Secondary	Effective Date of SBUL	Before SBUL Use Rate	After SBUL Use Rates		
				Lowest	Highest	Latest
ALASKA	S	09/12/90	45.0 04/89			
CALIFORNIA	S	01/01/86	25.8 11/85	45.3 02/86	67.8 06/90	67.8 06/90
COLORADO	S	07/01/87	18.0 12/86	47.0 01/89	51.0 08/87	47.0 01/89
CONNECTICUT	P	01/01/86	25.0 12/85	46.1 06/88	58.5 06/90	58.5 06/90
DIST. COLUMBIA	S	12/12/85		30.0 04/86	55.0 07/86	48.7 08/89
FLORIDA	S	07/01/86	28.1 02/86	40.8 09/86	60.5 01/87	55.2 08/89
GEORGIA	S	09/01/88	27.8 07/88	38.8 03/89	41.0 02/90	41.0 02/90

OBSERVED SAFETY BELT USE STATISTICS BY STATE
FOR STATES WITH SAFETY BELT USE LAWS
(PERCENTAGE/SURVEY DATE)

State	Primary --- Secondary	Effective Date of SBUL	Before SBUL Use Rate	After SBUL Use Rates		
				Lowest	Highest	Latest
HAWAII	P	12/16/85	33.0 12/85	63.5 11/87	80.5 01/90	80.5 01/90
IDAHO	S	07/01/86	15.6 06/86	21.3 01/87	36.1 06/90	36.1 06/90
ILLINOIS	S	07/01/85	15.9 04/85	27.6 01/86	47.0 06/87	40.5 04/89
INDIANA	S	01/01/87	9.5 05/85	42.6 04/88	52.0 08/87	47.4 07/89
IOWA	P	07/01/86	27.4 06/86	46.0 09/86	63.0 04/87	59.0 09/89
KANSAS	S	07/01/86	10.7 11/85	23.2 10/86	52.0 10/89	52.0 10/89
LOUISIANA	S	07/01/86	12.0 12/85	35.0 12/86	40.6 05/89	38.8 09/90
MARYLAND	S	07/01/86	28.0 05/86	60.0 07/86	73.5 12/86	67.0 07/89
MASSACHUSETTS ***	S	01/01/86	19.8 12/85	23.9 12/86	37.2 02/86	28.0 04/89
MICHIGAN	S	07/01/85	25.8 04/85	43.0 12/85	58.4 07/85	50.5 05/90
MINNESOTA	S	08/01/86	19.8 07/86	32.0 11/86	46.7 08/88	44.1 08/89
MISSISSIPPI	P	03/20/90	18.6 08/89			
MISSOURI	S	09/28/85	12.2 06/85	19.2 10/85	54.1 12/88	54.0 04/90
MONTANA	S	10/01/87	33.0 06/87	46.0 10/87	63.6 06/90	63.6 06/90
NEBRASKA ***	S	09/06/85	23.0 08/85	28.0 10/87	45.0 11/85	32.0 08/89
NEVADA	S	07/01/87	21.1 01/87	38.4 10/88	42.1 11/87	38.4 10/88

OBSERVED SAFETY BELT USE STATISTICS BY STATE
FOR STATES WITH SAFETY BELT USE LAWS
(PERCENTAGE/SURVEY DATE)

State	Primary --- Secondary	Effective Date of SBUL	Before SBUL Use Rate	After SBUL Use Rates		
				Lowest	Highest	Latest
NEW JERSEY	S	03/01/85	18.2 02/85	35.1 02/87	44.1 01/89	44.1 01/89
NEW MEXICO	P	01/01/86	28.2 12/85	42.7 02/88	64.7 09/89	58.7 07/90
NEW YORK	P	12/01/84	15.9 10/84	45.9 09/85	64.0 09/87	60.0 09/89
NORTH CAROLINA	P	10/01/85	24.1 09/85	38.9 08/86	75.8 01/87	62.0 06/89
NORTH DAKOTA ***	S	05/07/89	22.0 10/88			
OHIO	S	05/06/86	28.0 03/86	33.4 12/88	48.2 03/87	44.4 11/89
OKLAHOMA	S	02/01/87	15.7 05/86	30.5 03/89	41.0 03/87	37.0 05/90
PENNSYLVANIA	S	11/23/87		43.9 07/88	49.5 04/89	49.5 04/89
PUERTO RICO	S	01/01/75		17.1 12/88	72.1 12/89	69.6 09/90
SOUTH CAROLINA	S	07/01/89		37.9 10/89	37.9 10/89	37.9 10/89
TENNESSEE	S	04/21/86		19.2 11/86	43.0 04/90	43.0 04/90
TEXAS	P	09/01/85	13.3 06/85	54.1 01/88	67.6 06/90	67.6 06/90
UTAH	S	04/28/86	17.7 04/86	22.1 03/87	44.2 06/89	44.2 06/89
VIRGINIA	S	01/01/88	37.9 06/87	51.1 03/90	63.1 06/88	56.0 09/90
WASHINGTON	S	06/11/86		36.0 10/86	55.4 04/89	55.4 04/89
WISCONSIN	S	12/01/87	26.2 04/87	48.7 10/88	56.0 03/88	52.0 04/90

*** State belt use law has been rescinded.