

SEAT BELT AND SHOULDER STRAP USE AMONG URBAN TRAVELERS

A Comparison of Results From 1974 and 1975 Surveys

by

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(The opinions, findings, and conclusions expressed in this
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ABSTRACT

During nine consecutive days in late January 1974, four major metropolitan areas of the state of Virginia were surveyed in an effort to determine seat belt use by urban travelers. Observer-data collectors were stationed at selected signalized intersections. Motorists in the lane adjacent to the curb were shown a clipboard lettered with the question "Are you wearing seat belts?" The observer then approached the vehicle and visually verified the response given, and recorded whether seat belts and/or shoulder straps were being used. The observer also recorded the age category of the vehicle and the sex and approximate age of each occupant.

Approximately one year later the survey was repeated, using the same intersection locations, days of the week, and hours of the day. Although there were intergroup variations between the 1974 and 1975 data, seat belt usage generally was greater during the second year. Driver use increased by 3.5%, from 24% in 1974 to 27.5% in 1975. Right front seat passenger use increased by 4.1%, from 18.2% in 1974 to 22.3% in 1975. There was no real change in use by the remaining passengers.

The most interesting aspect of the study was the association between the driver's use of belts and the right front passenger's use. In vehicles in which the driver was not using a seat belt, neither were over 96% of the right front passengers. When the driver was using only a lap belt, 67% (1974) and 75.4% (1975) of the right front passengers were using either the lap belt or the lap and shoulder belts. When the driver was using both lap and shoulder belts, 77% (1974) and 84.3% (1975) of the right front passengers were using either the lap belt or the lap and shoulder belts. Though no causal effect is assumed from these findings, the association between driver and passenger use is worth noting.

Other changes in the rate of use involved the age of the vehicle, the sex and age of the occupant, and the area of the state surveyed, but there was no consistent change with a relationship to occupant seat position which ran through each of these data categories.

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INTRODUCTION

Numerous efforts have been initiated by state and federal agencies to persuade the motoring public to use the restraining devices in their vehicles. Most drivers are aware of a number of public information campaigns carried out in newspapers and magazines, on posters and billboards, and over radio and television. The public is also familiar with warning buzzers and lights, the interlock system, the three-point belt, and inertial reels. In addition, legislation has been sought by a number of jurisdictions which would require the use of seat belts, and the federal government has even offered incentive grants to those states which pass such legislation.

Much previous research has indicated the safety advantages of wearing seat belts. These advantages were sufficiently well documented by 1963 that Virginia passed a statute requiring that all new cars be equipped with seat belts before they were offered for sale. The availability of seat belts, however, is not an indication of their use by the motoring public.

Investigations have been conducted to determine whether seat belts are actually being used. Early studies relied on questionnaire and interview formats, while later ones used a variety of observational techniques. When motorists responded to questions on the use of seat belts they generally gave the socially acceptable affirmative reply. When motorists were observed, actual belt use was less than their stated use.

The Highway Safety Division of Virginia favors the required use of seat belts and has requested the General Assembly to pass mandatory use legislation. In order to determine what safety advantages would be gained from mandatory use of seat belts by motorists, it is first necessary to determine the rate of belt use under the present voluntary system.

PURPOSE

This study was initiated to determine the extent to which urban travelers, within the state of Virginia, were using available seat belts and shoulder straps during the winters of 1973-74 and 1974-75. A second objective was to determine if changes in use occurred from the first winter to the second.

METHOD

Observer-data collectors surveyed the four major metropolitan areas of the state; namely, Western Virginia (Roanoke-Salem-Vinton), Northern Virginia (Alexandria-Arlington-Fairfax-Belvoir), Central Virginia (Richmond-Henrico-Chesterfield), and Eastern Virginia (Norfolk-Virginia Beach-Hampton). Each day of the week, Sunday through Saturday, was sampled for at least one full day while Thursday and Friday were sampled for two days.

Three sites were used each day of the survey. These sites were chosen because the thoroughfares carried relatively high traffic volumes and provided an adequate and safe vantage point for personal observations. Each day of the survey both primary and secondary routes were sampled. Even though no interstate highways were among the study sites, vehicles within the immediate area going to and from such roadways were surveyed. Three time periods were used: (1) 8:00 a.m. to 10:30 a.m., (2) 11:30 a.m. to 2:00 p.m., and (3) 3:30 p.m. to 6:00 p.m.

The observations were made at signalized intersections and only the lane adjacent to the curb was used to obtain the sample. A clipboard lettered with the question "Are you wearing seat belts?" was displayed by the observer to alert travelers to the purpose of the survey. After the clipboard was presented, the observer approached the car from the front at a 45° angle. Approaching the right front fender the observer walked along the side and past the vehicle while looking in and recording the data. Upon seeing the question most occupants would reply. This reply was acknowledged, but only data personally verified by the observer were recorded. Volunteers were acknowledged, but their responses were not recorded.

At each site the data collectors recorded whether the driver and passengers were using only the lap belt, both the lap and shoulder belts, or no form of restraint. They also recorded the sex and approximate age of the occupants, their seat positions, and the approximate age of the vehicle (see Figure 1). Occupant age was divided into four categories: (1) pre-adults (up to 16 years old), (2) young adults (17-30 years), (3) middle adults (31-60 years), and (4) older adults (over 60 years). Vehicle

1-6445 1.

SAFETY BELT USAGE SURVEY FORM

Day _____ Form No. _____ Start _____ Stop _____ Location _____
 At _____

FRONT SEATS

Veh. Age	Veh.	Driver			Center			Window		
		Belts	Sex	Occ. Age	Belts	Sex	Occ. Age	Belts	Sex	Occ. Age
1 2 3	1	L S N	M F	P Y M O	L S N	M F	P Y M O	L S N	M F	P Y M O
1 2 3	2	L S N	M F	P Y M O	L S N	M F	P Y M O	L S N	M F	P Y M O
1 2 3	3	L S N	M F	P Y M O	L S N	M F	P Y M O	L S N	M F	P Y M O
1 2 3	4	L S N	M F	P Y M O	L S N	M F	P Y M O	L S N	M F	P Y M O
1 2 3	5	L S N	M F	P Y M O	L S N	M F	P Y M O	L S N	M F	P Y M O
1 2 3	6	L S N	M F	P Y M O	L S N	M F	P Y M O	L S N	M F	P Y M O
1 2 3	7	L S N	M F	P Y M O	L S N	M F	P Y M O	L S N	M F	P Y M O
1 2 3	8	L S N	M F	P Y M O	L S N	M F	P Y M O	L S N	M F	P Y M O
1 2 3	9	L S N	M F	P Y M O	L S N	M F	P Y M O	L S N	M F	P Y M O
1 2 3	10	L S N	M F	P Y M O	L S N	M F	P Y M O	L S N	M F	P Y M O

REAR SEATS

Veh. Age	Veh.	Window			Center			Window		
		Belts	Sex	Occ. Age	Belts	Sex	Occ. Age	Belts	Sex	Occ. Age
1	1	L S N	M F	P Y M O	L S N	M F	P Y M O	L S N	M F	P Y M O
2	2	L S N	M F	P Y M O	L S N	M F	P Y M O	L S N	M F	P Y M O
3	3	L S N	M F	P Y M O	L S N	M F	P Y M O	L S N	M F	P Y M O
4	4	L S N	M F	P Y M O	L S N	M F	P Y M O	L S N	M F	P Y M O
5	5	L S N	M F	P Y M O	L S N	M F	P Y M O	L S N	M F	P Y M O
6	6	L S N	M F	P Y M O	L S N	M F	P Y M O	L S N	M F	P Y M O
7	7	L S N	M F	P Y M O	L S N	M F	P Y M O	L S N	M F	P Y M O
8	8	L S N	M F	P Y M O	L S N	M F	P Y M O	L S N	M F	P Y M O
9	9	L S N	M F	P Y M O	L S N	M F	P Y M O	L S N	M F	P Y M O
10	10	L S N	M F	P Y M O	L S N	M F	P Y M O	L S N	M F	P Y M O

Vehicle Age
 1 = Pre 1963
 2 = 1963-1971
 3 = 1972-Present

Restraint Use
 L = Lap
 S = Shoulder
 N = None

Occupant Age
 P = Pre Adult (0-16 Yrs.)
 Y = Young Adult (17-30 Yrs.)
 M = Middle Adult (31-60 Yrs.)
 O = Older Adult (61 and Up)

age was recorded by three categories: (1) pre-1963 automobiles, for which seat belts were not required to be installed in cars sold in Virginia, (2) 1963-1971, and (3) 1972 to present, which includes vehicles equipped with buzzer systems, interlocks, etc.

ANALYSES

During the nine-day survey period in 1974, data were collected on the occupants of 3,440 vehicles. One year later 6,150 vehicles were surveyed in the same areas of the state and on the same days of the week. Data on the number of individuals by time period, vehicle age, location, and age and sex of occupants are presented in the Appendixes. In each case, more people were sampled during the second year of the study, but there were some variations in the percentages of the totals of the several subgroups. In 1975 there were slight changes in the percentages of people surveyed by time of day (see Appendix Table A-1), by age of the automobile (Appendix Table A-2), by area of the state (Appendix Table A-3), and by sex of the occupant (Appendix Table A-4). Also during the second survey, the age groups of pre, young, and older adults each had an increase in the percentage of the total sample (see Appendix Table A-5).

In Table 1 the percentages of occupants using seat belts during each of the surveys are shown. There was an increase of 3.5% in belt use between 1974 and 1975 for drivers, from 24% to 27.5% ($p < .01$); and an increase of 4.1% for right front passengers, from 18.2% to 22.3% ($p < .01$). See Appendix Table B-1 for the number of individuals using seat belts, the chi-square values and the significance levels. The overall increase in use was primarily due to an increase in the use of lap and shoulder belts. There was no change in belt use in the category defined as "other passengers."

One interesting aspect of the study concerns the association between driver and passenger seat belt use. If the driver uses his seat belts, does his action influence the passengers to also use theirs? Table 2 presents percentages of use data that can be used in answering this question, and Appendix Table B-2 contains the number of individuals in each category, the chi-square values, and the significance levels. When the driver was found not to be using the seat belts, more than 96% of the passengers likewise were not using seat belts. If the driver was found to be using only lap belts in the 1974 survey more than 67% of the right front passengers and 33% of the remaining passengers were using seat belts. Corresponding data for the 1975 survey showed that more than 75% of the right front passengers and 34% of the remaining passengers were using seat belts. In the 1974 survey, if the driver was using both

lap and shoulder belts, more than 77% of the right front passengers and 41% of the remaining passengers were using seat belts. During the 1975 survey, if the driver was using both lap and shoulder belts more than 84% of the right front passengers and 30% of the remaining passengers were using seat belts. It can be seen that there is a significant association between driver and passenger use of seat belts, especially in the case of the right front passenger.

Table 1

Percentage Usage of Seat Belts — 1974 vs. 1975

Occupant Seat Position	Restraint Used	1974 Use	1975 Use
Driver	Lap Only	19.4	17.5
	Lap and Shoulder	4.6	10.0
	None	76.0	72.5
Right Front Passengers	Lap Only	13.3	13.5
	Lap and Shoulder	4.9	8.8
	None	81.7	77.6
Remaining Passengers	Lap Only	9.9	8.7
	Lap and Shoulder	0.2	1.6
	None	89.9	89.6

Statistical differences in the usage figure for 1974 and 1975 occurred only in the case of right front seat passengers in automobiles where the driver was using only lap belts. There was an increase from 67% in 1974 to slightly over 75% in 1975 ($p < .05$). These data seem to indicate that if the driver uses seat belts a high proportion of the right front seat passengers also use their seat belts, and, to a lesser degree, so do the other passengers. The data do not permit a determination of the cause of this association. It is not known whether driver use causes the passenger to use his seat belt, or whether it is the passenger who causes the driver to buckle up, or whether it is a case of both driver and passenger being predisposed toward seat belt use. It is only known that when one buckles up, a high percentage of the other also use seat belts.

Table 2

Association Between Driver and Passenger Use
by Percentage of Use

Occupant Position	Occupant Use of Belts	When Driver Not Using Belts		When Driver Using Only Lap Belts		When Driver Using Lap and Shoulder Belts	
		1974	1975	1974	1975	1974	1975
Percent Right Front Passengers Using	Lap Only	2.0	2.5	66.5	71.2	4.9	7.8
	Lap and Shoulder	0.8	1.3	0.6	4.2	72.1	76.5
	None	97.2	96.3	32.9	24.6	23.0	15.7
Percent Remaining Passengers Using	Lap Only	4.1	2.5	33.8	32.2	33.3	22.1
	Lap and Shoulder*	—	0.7	—	2.7	8.3	8.1
	None	95.9	96.8	66.2	65.1	58.3	69.8

*Child seats.

The percentages of belt use according to the age of the vehicle are presented in Table 3 (see Appendix Table B-3 for numbers, chi-square values, and significance levels). The 1975 survey data showed increases in belt use by drivers in all three vehicle age groups: Pre-1963, from 4.3% to 12.7%, ($p < .05$); 1963-1971, from 13.5% to 17.9% ($p < .01$); and post-1971, from 33.6% to 37.4% ($p < .01$). Also in relation to vehicle age, there were increases in use by right front passengers in the 1963-1971 category, from 9.9% to 15.1% ($p < .05$), and the post-1971 category, from 25.2% to 30.9% ($p < .05$). There was no change, at the .05 level, in belt use by the category designated "other passengers."

Percentages of belt use by the sex of the occupant are presented in Table 4 (see also Appendix Table B-4 for the complete data, chi-square values, and significance levels). There was an increase in belt use by male drivers, from 21.1% to 26.8% ($p < .01$); and by male right front passengers from 11.3% to 18.4% ($p < .01$). There was no change, at the .05 level, in female driver and passenger use of seat belts. For both years of the survey, female drivers and right front passengers used available seat belts at a higher rate than did their male counterparts.

Table 3

Percentage of Belt Usage by Vehicle Age

Occupant Seat Position	Vehicle Age	1974 Use	1975 Use
Driver	Pre-'62	4.3	12.7
	'63-'71	13.5	17.9
	Post-'71	33.6	37.5
Right Front Passenger	Pre-'62	4.8	5.2
	'63-'71	9.9	15.1
	Post-'71	25.2	30.9
Remaining Passengers	Pre-'62	—	3.1
	'63-'71	6.1	9.1
	Post-'71	14.7	12.6

Table 4

Percentage of Belt Use by Sex of Occupant

Occupant Seat Position	Sex of Occupant	1974 Use	1975 Use
Driver	Male	21.1	26.8
	Female	29.7	28.7
Right Front Passenger	Male	11.3	18.4
	Female	22.8	24.3
Remaining Passengers	Male	11.0	10.1
	Female	8.9	10.4

In Table 5, the percentages of belt use by the approximate age of the occupants are shown. Appendix Table B-5 contains the data belt use, the chi-square values, and the significance levels. There was an increase in belt use by young adult drivers, from 25.4% to 29.8% ($p < .01$); and an increase from 19% to 25% ($p < .05$) by middle adult right front passengers. There were no other changes ($p < .05$) in seat belt use by drivers or passengers in the other occupant age categories.

Table 5

Percentages of Belt Use by Age of Occupant

Occupant Seat Position	Age of Occupant	1974 Use	1975 Use
Driver	Pre-Adult	—	20.0
	Young Adult	25.4	29.8
	Middle Adult	23.3	25.7
	Older Adult	21.6	26.1
Right Front Passenger	Pre-Adult	16.1	17.2
	Young Adult	17.8	22.3
	Middle Adult	19.0	25.0
	Older Adult	20.0	19.2
Remaining Passengers	Pre-Adult	13.6	10.8
	Young Adult	—	8.6
	Middle Adult	10.7	11.9
	Older Adult	6.3	7.0

The percentages of belt use during the three daily time periods are contained in Table 6; and the number of occupants using seat belts, the chi-squares values, and the significance levels are contained in Appendix Table B-6. There was an increase in driver belt use during the midday period, from 23.1% to 27.6% ($p < .01$); and during the afternoon period, from 22.9% to 26.9% ($p < .01$). There was no change ($p < .05$) in belt use by drivers during the morning period or by passengers during any of the survey time periods. For each category of occupant seat position the rate of use was relatively consistent for each of the time periods of the day.

Table 6

Percentages of Belt Use by Time Periods

Occupant Seat Position	Time Period	1974 Use	1975 Use
Driver	A.M.	27.2	28.3
	MID	23.1	27.6
	P.M.	22.9	26.9
Right Front Passenger	A.M.	18.9	21.8
	MID	19.1	23.5
	P.M.	17.4	21.3
Remaining Passengers	A.M.	15.5	12.4
	MID	9.2	12.1
	P.M.	8.8	7.9

Table 7 presents the percentages of belt use according to the area of the state surveyed, and Appendix Table B-7 contains the use data and statistical information. In the Western area, there was a decrease in driver use from 21.5% to 17.4% ($p < .05$). There were increases in driver use in the Northern area, from 27.3% to 36.1% ($p < .01$); and in the Central area, from 23.6% to 27.9% ($p < .05$). There also was an increase in right front passenger use in the Northern area, from 23.1% to 33.6% ($p < .01$). There was no statistically significant change in driver or passenger use in the Eastern area.

The information presented in Table 8 and Appendix Table B-8 show there were increases in belt use by male drivers of 1963-1971 cars, from 12% to 17% ($p < .01$); and of post-1971 cars, from 31.1% to 37.2% ($p < .01$). Increases in seat belt use by male right front passengers also occurred in 1963-1971 model cars, from 4.8% to 11.3% ($p < .05$); and in post-1971 cars, from 18.2% to 27% ($p < .05$). There were no differences ($p < .05$) in belt use between the 1974 and 1975 surveys for the other male/vehicle age categories. Additionally, for all female/vehicle age categories there were no differences in belt use ($p < .05$) between the two surveys. The data does indicate that for both males and females the trend of seat belt use increased in direct relationship to the age of the vehicle; the newer the age category, the greater the use of seat belts.

Survey data on the percentage of belt use by the sex and age of the occupants are presented in Table 9, while Appendix Table B-9 contains the use figures and statistical information. There were two significant changes in the rate of use. The first was by male, young adult drivers, from 20.6% to 30.3% ($p < .01$); and the second by male, middle adult, right front passengers, from 12.6% to 27.4% ($p < .01$). While there were variations in the percentages of use between the two surveys in other categories, no change occurred which exceeded the .05 level of significance, which was the standard set for data differences.

Table 7

Percentages of Belt Use by Area Surveyed

Occupant Seat Position	Survey Area	1974 Use	1975 Use
Driver	Western	21.5	17.4
	Northern	27.3	36.1
	Central	23.6	27.9
	Eastern	21.7	22.8
Right Front Passenger	Western	15.6	10.5
	Northern	23.1	33.6
	Central	16.7	19.6
	Eastern	13.1	16.9
Remaining Passengers	Western	6.2	8.8
	Northern	13.5	15.6
	Central	11.1	10.5
	Eastern	8.3	4.1

Table 8
 Percentages of Belt Use By
 Sex of Occupant and Vehicle Age

	Occupant Seat Position	Age of Vehicle	1974 Use	1975 Use
MALE	Driver	Pre-'62	1.1	14.5
		'63-'71	12.0	17.0
		Post-'71	31.1	37.2
	Right Front Passenger	Pre-'62	4.8	8.2
		'63-'71	4.8	11.3
		Post-'71	18.2	27.0
Remaining Passengers	Pre-'62	—	3.7	
	'63-'71	6.5	9.4	
	Post-'71	16.2	11.5	
FEMALE	Driver	Pre-'62	18.2	9.9
		'63-'71	17.2	19.4
		Post-'71	37.5	37.6
	Right Front Passenger	Pre-'62	5.0	3.5
		'63-'71	14.2	17.2
		Post-'71	28.8	32.7
	Remaining Passengers	Pre-'62	—	2.6
		'63-'71	5.6	8.5
		Post-'71	12.5	13.5

Table 9

Percentage of Belt Use by
Sex and Age of Occupants

	Occupant Seat Position	Age of Occupant	1974 Use	1975 Use
MALE	Driver	Pre-Adult	—	50.0
		Young Adult	20.6	30.3
		Middle Adult	21.4	23.9
		Older Adult	20.5	26.3
	Right Front Passenger	Pre-Adult	14.9	16.8
		Young Adult	9.0	14.4
		Middle Adult	12.6	27.4
		Older Adult	6.7	13.0
	Remaining Passengers	Pre-Adult	14.1	10.4
		Young Adult	—	7.3
		Middle Adult	14.6	14.3
		Older Adult	—	—
FEMALE	Driver	Pre-Adult	—	12.5
		Young Adult	33.3	29.1
		Middle Adult	27.3	28.9
		Older Adult	24.1	25.8
	Right Front Passenger	Pre-Adult	18.2	17.9
		Young Adult	23.7	26.5
		Middle Adult	22.5	24.2
		Older Adult	23.6	21.1
	Remaining Passengers	Pre-Adult	13.0	11.2
		Young Adult	—	9.5
		Middle Adult	5.6	10.6
		Older Adult	12.5	7.9

The statistically significant changes in the percentages of seat belt use according to vehicle and occupant ages are contained in Table 10. The complete data on the percentages of use are presented in Appendix Table C-1, while the number of occupants using seat belts, the chi-square values, and the significance levels are in Appendix Table B-10. For pre-1963 vehicles, the number of observations from the 1974 survey were too few to permit the computation of chi-square values to test the significance between the two years' data. In those vehicle age categories in which computations could be carried out, significant differences occurred in five cases. For 1963-1971 cars, there were increases in belt use by middle adult drivers, from 12.7% to 17.9%, ($p < .01$); and by middle adult right front passengers, from 10.6% to 18.4% ($p < .05$). For post-1971 cars, there were increases in belt use among young adult drivers, from 36.3% to 41% ($p < .05$); young adult right front passengers, from 26.2% to 33.7% ($p < .05$); and middle adult right front passengers, from 24.8% to 32.9% ($p < .05$).

The statistically significant changes in the percentages of seat belt use by vehicle age and area of the state surveyed are presented in Table 11. The reader is referred to Appendixes Tables B-11 and C-2 for the full data on percentages and numbers of occupants who were observed wearing seat belts. Too few pre-1963 cars were observed during the 1974 survey to allow computation of the chi-square values between the two years' data. However, chi-square computations were carried out for comparisons in the 1963-71 and post-1971 vehicle age categories, and significant differences were found in 10 categories. For 1963-1971 model cars, there was a decrease in belt use by Western drivers, from 15.7% to 10.5% ($p < .05$). There were increases in belt use in all occupant seat categories in the Northern area 1963-1971 cars: drivers, from 14.2% to 25% ($p < .01$); right front passengers, from 13.4% to 28.2% ($p < .01$); and remaining passengers, from 6.1% to 16.3% ($p < .05$). Increases in belt use in 1963-1971 cars in the Central area occurred for drivers, from 11% to 20.3% ($p < .01$); and right front passengers, from 5.3% to 12.7% ($p < .05$).

There was a decrease in belt use among Western drivers of post-1971 cars, from 36% to 26.7% ($p < .01$). Increases did occur for both Northern and Central drivers, from 37.5% to 47.3% ($p < .01$) and from 31.1% to 36% ($p < .05$), respectively; and for Northern right front passengers, who were occupants of post-1971 model cars from 29.9% to 42.3% ($p < .01$). Any other differences that occurred did not reach the set level for statistical significance ($p < .05$).

Table 10

Percentage of Belt Use by
Vehicle and Occupant Ages
(Statistically Significant Changes Only)

Vehicle Age	Occupant Seat Position	Age of Occupant	1974 Use	1975 Use
1963 to 1971	Drivers	Middle Adult	12.7	17.9
	Right Front Passengers	Middle Adult	10.6	18.4
Post-1971	Drivers	Young Adult	36.3	41.0
	Right Front Passengers	Young Adult	26.2	33.7
		Middle Adult	24.8	32.9

Table 11

Percentage of Belt Use by
Vehicle Age and Area Surveyed
(Statistically Significant Changes Only)

Vehicle Age	Occupant Seat Position	Survey Area	1974 Use	1975 Use
1963 to 1971	Drivers	Western	15.7	10.5
		Northern	14.2	25.0
		Central	11.0	20.3
	Right Front Passengers	Northern	13.4	28.2
		Central	5.3	12.7
	Remaining Passengers	Northern	6.1	16.3
Post-1971	Drivers	Western	36.0	26.7
		Northern	37.5	47.3
		Central	31.1	36.0
	Right Front Passengers	Northern	29.9	42.3

SUMMARY AND CONCLUSIONS

During the 1974 survey 3,440 passenger cars containing 4,944 occupants were surveyed. Seat belts were used by 21.5% of all of the occupants. Driver use was 24% and passenger use was 15.7%. Of the 2,939 males, 18.7% were using seat belts; and of the 2,005 females, 25.5% were using them.

The 1975 survey included 6,150 passenger cars containing 9,297 occupants. Seat belt use increased to 24.5% of all of the occupants. Driver use increased to 27.5%, and passenger use increased to 18.6%. Of the 4,989 males surveyed, 24.1% were using seat belts. This was an increase in use over the first rate. Of the 4,308 females surveyed, 25% were using seat belts. Practically speaking, this figure represents no change over the first year's rate.

There are several findings which can be generalized from the results of the two years of the study.

1. There was a higher rate of use of seat belts in 1975 than in 1974.
2. Less than 25% of all occupants and 28% of all drivers were using seat belts.
3. The rate of use in post-1971 cars was higher than in the other vehicle age categories.
4. Lap belts only were used more often than lap and shoulder belts, even in cars equipped with shoulder belts.
5. There was a significant association between driver and passenger use of seat belts.
6. The rate of use by females was higher than that for males, although in 1975 the differences were small.
7. The categories of young and middle adults, the ages of 17 to 60 years, had a higher rate of use than the categories of pre- and older adults.
8. Use of seat belts was greater in the Northern Virginia survey area than in the other areas of the state.

In addition to the above general findings, there are a number of specific instances in which there was a statistically significant

change in seat belt use by vehicle occupants. Decreases in use ($p < .05$) occurred in the Western survey area for drivers of 1963-1971 and post-1971 model cars. All other changes ($p < .05$) in use rates were increases. These included:

1. Total drivers in all vehicle age categories;
2. right front passengers in 1963-1971 and post-1971 cars;
3. male drivers and male right front passengers;
4. young adult drivers and middle adult right front passengers;
5. drivers during the midday and afternoon time periods;
6. Northern and Central area drivers and Northern right front passengers;
7. male drivers and male right front passengers in both the 1963-1971 and post-1971 categories of vehicles;
8. male, young adult drivers and male, middle adult right front passengers;
9. middle adult drivers and right front passengers in 1963-1971 cars and young adult drivers, right front passengers, and middle adult right front passengers in post-1971 cars; and
10. all occupant categories (driver and passengers) of Northern area 1963-1971 cars, drivers and right front passengers of Central area 1963-1971 cars, Northern and Central area drivers of post-1971 cars, and Northern area right front passengers in post-1971 cars.

Changes in belt use also occurred in a number of other categories, but when chi-square tests were run, none met the standard set for significance ($p < .05$). Some of the changes in rate of use appear large, but the size of the survey sample was so small that a statistical analysis could not be carried out on the data.

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Appendix Table A-1

1974 vs. 1975 Time Period Data

Time Periods	1974		1975	
	No.	% Total	No.	% Total
Morning	887	25.8	1,613	26.2
Midday	1,122	32.6	2,348	38.2
Afternoon	1,431	41.6	2,189	35.6

Appendix Table A-2

1974 vs. 1975 Vehicle Age Data

Vehicle Age	1974		1975	
	No.	% Total	No.	% Total
Pre-1962	117	3.4	330	5.4
1963-1971	1,467	42.7	2,693	43.8
Post-1971	1,856	53.9	3,127	50.9

Appendix Table A-3

1974 vs. 1975 Location Data

Location	1974		1975	
	No.	% Total	No.	% Total
Western	776	22.6	1,136	18.5
Northern	1,111	32.3	1,952	31.7
Central	1,059	30.8	1,820	29.6
Eastern	494	14.4	1,242	20.2

Appendix Table A-4

1974 vs. 1975 Sex of Occupants Data

Occupant Seat Position	Sex of Occupant	1974		1975	
		No.	%	No.	%
Driver	Female	1,180	34.3	2,329	37.9
	Male	2,260	65.7	3,821	62.1
Right Front Passengers	Female	628	60.7	1,441	66.6
	Male	407	39.3	722	33.4
Remaining Passengers	Female	192	42.2	537	54.6
	Male	263	57.8	447	45.4

Appendix Table A-5

1974 vs. 1975 Age of Occupant Data

Occupant Seat Position	Age of Occupant	1974		1975	
		No.	%	No.	%
Driver	Pre-Adult	0	—	10	0.2
	Young Adult	1,334	38.8	2,663	43.3
	Middle Adult	1,930	56.1	3,060	49.8
	Older Adult	176	5.1	417	6.8
Right Front Passengers	Pre-Adult	118	11.4	290	13.4
	Young Adult	416	40.2	912	42.2
	Middle Adult	431	41.6	763	35.3
	Older Adult	70	6.8	198	9.2
Remaining Passengers	Pre-Adult	264	58.0	574	58.3
	Young Adult	91	20.0	233	23.7
	Middle Adult	84	18.5	135	13.7
	Older Adult	16	3.5	43	4.4

Appendix Table B-1

1974 vs. 1975 Use of Seat Belts

Occupant Seat Position	Restraint Used	1974 No.	1975 No.	chi-square
Driver	Lap Only	668	1,076	87.52 p < .01
	Lap and Shoulder	159	616	
	None	2,613	4,458	
Right Front Passengers	Lap Only	138	293	15.55 p < .01
	Lap and Shoulder	51	191	
	None	846	1,681	
Remaining Passengers	Lap Only	45	86	0.02
	Lap and Shoulder	1	16	
	None	409	883	

Appendix Table B-2

Association Between the Number of Drivers and Passengers Using Seat Belts

Occupant Position	Occupant Use of Belts	Driver Not Using Belts		Driver Using Only Lap Belts		Driver Using Lap And Shoulder Belts	
		1974	1975	1974	1975	1974	1975
Number Right Front Passengers Using	Lap Only	16	40	119	237	3	16
	Lap and Shoulder	6	21	1	14	44	156
	None	773	1,567	59	82	14	32
chi-square		1.88		4.05 p < .05		1.73	
Number Remaining Passengers Using	Lap Only	15	19	26	48	4	19
	Lap and Shoulder	0	5*	0	4*	1*	7*
	None	351	726	51	97	7	60
chi-square		0.59		0.03		0.64	

*child seat

Appendix Table B-3

Number of Belts Used by Vehicle Age

Occupant Seat Position	Vehicle Age	1974 Number		1975 Number		chi-square
		Used	Not Used	Used	Not Used	
Driver	Pre-'62	5	112	42	288	6.56 p <.05
	'63-'71	198	1,269	481	2,212	13.24 p <.01
	Post-'71	624	1,232	1,169	1,958	7.16 p <.01
Right Front Passenger	Pre-'62	2	40	7	128	*
	'63-'71	41	372	144	810	6.58 p <.05
	Post-'71	146	434	333	743	6.11 p <.05
Remaining Passengers	Pre-'62	0	26	2	63	*
	'63-'71	12	185	41	410	1.64
	Post-'71	34	198	59	410	0.58

*One sample size too small to compute chi-square.

Appendix Table B-4

Number of Belts Used by Sex of Occupant

Occupant Seat Position	Sex of Occupant	1974 Number		1975 Number		chi-square
		Used	Not Used	Used	Not Used	
Driver	Male	476	1,784	1,022	2,798	24.78 p <.01
	Female	351	829	669	1,660	0.40
Right Front Passenger	Male	46	361	133	589	9.89 p <.01
	Female	143	485	350	1,091	0.56
Remaining Passengers	Male	29	234	45	402	0.16
	Female	17	175	56	481	0.39

Appendix Table B-5

Number of Belts Used by Age of Occupant

Occupant Seat Position	Age of Occupant	1974 Number		1975 Number		chi-square
		Used	Not Used	Used	Not Used	
Driver	Pre-Adult	0	0	2	8	*
	Young Adult	339	995	794	1,869	8.49 p < .01
	Middle Adult	450	1,480	786	2,273	3.59
	Older Adult	38	138	109	308	1.37
Right Front Passenger	Pre-Adult	19	99	50	240	0.08
	Young Adult	74	342	203	709	3.46
	Middle Adult	82	349	191	572	5.64 p < .05
	Older Adult	14	56	38	160	0.02
Remaining Passengers	Pre-Adult	36	228	62	512	1.41
	Young Adult	0	91	20	213	*
	Middle Adult	9	75	16	118	0.08
	Older Adult	1	15	3	40	*

*One sample size too small to compute chi-square.

Appendix Table B-6

Number of Belts Used by Time Periods

Occupant Seat Position	Time Period	1974 Number		1975 Number		chi-square
		Used	Not Used	Used	Not Used	
Driver	A.M.	241	646	456	1,157	0.34
	MID	259	863	647	1,701	7.87 p < .01
	P.M.	327	1,104	589	1,600	7.53 p < .01
Right Front Passenger	A.M.	38	163	87	312	0.68
	MID	65	275	220	716	2.77
	P.M.	86	408	177	653	2.98
Remaining Passengers	A.M.	13	71	19	134	0.43
	MID	12	119	50	364	0.84
	P.M.	21	219	33	385	0.15

Appendix Table B-7

Number of Belts Used by Area Surveyed

Occupant Seat Position	Survey Area	1974 Number		1975 Number		chi- square
		Used	Not Used	Used	Not Used	
Driver	Western	167	609	198	938	5.00 p < .05
	Northern	303	808	704	1,248	24.81 p < .01
	Central	250	809	507	1,313	6.24 p < .05
	Eastern	107	387	283	959	0.26
Right Front Passenger	Western	34	184	37	314	3.15
	Northern	87	289	253	499	13.14 p < .01
	Central	48	240	104	427	1.05
	Eastern	20	133	90	441	1.32
Remaining Passengers	Western	8	121	17	177	0.71
	Northern	22	141	53	286	0.40
	Central	13	104	22	187	0.03
	Eastern	3	33	10	233	1.26

Appendix Table B-8

Number of Belts Used By
Sex of Occupant and Vehicle Age

Occupant Seat Position		Age of Vehicle	1974 Number		1975 Number		chi- square
			Used	Not Used	Used	Not Used	
Male	Driver	Pre-'62	1	94	35	206	*
		'63-'71	124	913	288	1,409	12.64 p < .01
		Post-'71	351	777	701	1,183	11.52 p < .01
	Right Front Passenger	Pre-'62	1	20	4	45	*
		'63-'71	9	179	38	298	6.28 p < .05
		Post-'71	36	162	91	246	5.36 p < .05
	Remaining Passengers	Pre-'62	0	19	1	26	*
		'63-'71	7	101	19	184	0.76
		Post-'71	22	114	25	192	1.57
Female	Driver	Pre-'62	4	18	9	82	1.20
		'63-'71	74	356	193	803	0.93
		Post-'71	273	455	467	775	0.002
	Right Front Passenger	Pre-'62	1	19	3	83	*
		'63-'71	32	193	106	511	1.05
		Post-'71	110	272	241	497	1.74
	Remaining Passengers	Pre-'62	0	8	1	37	*
		'63-'71	5	84	21	226	0.76
		Post-'71	12	84	34	218	0.06

*One sample size too small to compute chi-square.

Appendix Table B-9

Number of Belts Used by
Sex and Age of Occupants

Occupant Seat Position		Age of Occupant	1974 Number		1975 Number		chi- square
			Used	Not Used	Used	Not Used	
Male	Driver	Pre-Adult	0	0	1	1	*
		Young Adult	170	656	483	1,110	26.18 p < .01
		Middle Adult	281	1,031	462	1,474	2.65
		Older Adult	25	97	76	213	1.56
	Right Front Passenger	Pre-Adult	11	63	26	129	0.13
		Young Adult	15	152	46	274	2.91
		Middle Adult	19	132	55	146	11.35 p < .01
		Older Adult	1	14	6	40	*
	Remaining Passengers	Pre-Adult	22	134	31	266	1.33
		Young Adult	0	51	7	89	*
		Middle Adult	7	41	7	42	0.002
		Older Adult	0	8	0	5	*
Female	Driver	Pre-Adult	0	0	1	7	*
		Young Adult	169	339	311	759	2.87
		Middle Adult	169	449	324	799	0.44
		Older Adult	13	41	33	95	0.06
	Right Front Passenger	Pre-Adult	8	36	24	110	0.002
		Young Adult	59	190	157	435	0.73
		Middle Adult	63	217	136	426	0.30
		Older Adult	13	42	32	120	0.16
	Remaining Passengers	Pre-Adult	14	94	31	246	0.24
		Young Adult	0	40	13	124	*
		Middle Adult	2	34	9	76	*
		Older Adult	1	7	3	35	*

*One sample size too small to compute chi-square.

Appendix Table B-10

Number of Belts Used By
Vehicle and Occupant Ages

Veh. Age.	Occupant Seat Position	Age of Occupant	1974 Number		1975 Number		chi- square
			Used	Not Used	Used	Not Used	
Pre-1962	Driver	Pre-Adult	0	0	0	0	*
		Young Adult	2	49	17	141	*
		Middle Adult	2	43	20	121	*
		Older Adult	1	20	5	26	*
	Right Front Passenger	Pre-Adult	1	1	1	13	*
		Young Adult	0	17	3	57	*
		Middle Adult	1	17	3	36	*
		Older Adult	0	5	0	22	*
	Remaining Passengers	Pre-Adult	0	13	2	36	*
		Young Adult	0	9	0	18	*
		Middle Adult	0	3	0	6	*
		Older Adult	0	1	0	3	*

*One sample size too small to compute chi-square.

Appendix Table B-10 (continued)

Number of Belts Used By
Vehicle and Occupant Ages

Veh. Age	Occupant Seat Position	Age of Occupant	1974 Number		1975 Number		chi- square
			Used	Not Used	Used	Not Used	
1963-1971	Driver	Pre-Adult	0	0	1	4	*
		Young Adult	81	496	186	879	3.23
		Middle Adult	102	700	257	1,175	10.42 p < .01
		Older Adult	15	73	37	154	0.21
	Right Front Passenger	Pre-Adult	3	46	23	117	*
		Young Adult	18	167	41	339	0.15
		Middle Adult	16	135	64	283	4.81 p < .05
		Older Adult	4	24	15	71	0.15
	Remaining Passengers	Pre-Adult	10	103	22	234	0.01
		Young Adult	0	45	10	94	*
		Middle Adult	1	34	8	63	*
		Older Adult	1	3	0	19	*

*One sample size too small to compute chi-square.

Appendix Table B-10 (Continued)

Number of Belts Used By
Vehicle and Occupant Ages

Veh. Age	Occupant Seat Position	Age of Occupant	1974 Number		1975 Number		chi- square
			Used	Not Used	Used	Not Used	
Post-1971	Driver	Pre-Adult	0	0	1	4	*
		Young Adult	256	450	591	849	4.53 p < .05
		Middle Adult	346	737	509	977	1.50
		Older Adult	22	45	67	128	0.05
	Right Front Passenger	Pre-Adult	15	52	26	110	0.30
		Young Adult	56	158	159	313	3.87 p < .05
		Middle Adult	65	197	124	253	4.85 p < .05
		Older Adult	10	27	23	67	0.03
	Remaining Passengers	Pre-Adult	26	112	38	242	1.98
		Young Adult	0	37	10	101	*
		Middle Adult	8	38	8	49	0.22
		Older Adult	0	11	3	18	*

*One sample size too small to compute chi-square.

Appendix Table B-11

Number of Belts Used by
Vehicle Age and Area Surveyed

Veh. Age	Occupant Seat Position	Survey Area	1974 Number		1975 Number		chi- square
			Used	Not Used	Used	Not Used	
Pre-1962	Driver	Western	2	58	1	25	*
		Northern	3	24	34	132	*
		Central	0	16	6	80	*
		Eastern	0	14	1	51	*
	Right Front Passenger	Western	1	22	0	12	*
		Northern	1	5	6	65	*
		Central	0	8	1	28	*
		Eastern	0	5	0	23	*
	Remaining Passengers	Western	0	17	0	5	*
		Northern	0	6	2	32	*
		Central	0	2	0	11	*
		Eastern	0	1	0	15	*

*One sample size too small to compute chi-square.

Appendix Table B-11 (Continued)

Number of Belts Used By
Vehicle Age and Area Surveyed

Veh. Age.	Occupant Seat Position	Survey Area	1974 Number		1975 Number		chi- square
			Used	Not Used	Used	Not Used	
1963-1971	Driver	Western	72	386	64	548	6.54 p < .05
		Northern	65	393	195	586	20.22 p < .01
		Central	41	331	159	624	15.19 p < .01
		Eastern	20	159	63	454	0.13
	Right Front Passenger	Western	12	102	14	187	1.22
		Northern	20	129	82	209	12.05 p < .01
		Central	5	90	30	206	3.97 p < .05
		Eastern	4	51	18	208	0.03
	Remaining Passengers	Western	6	64	7	95	0.17
		Northern	4	62	22	113	4.12 p < .05
		Central	1	39	9	92	*
		Eastern	1	20	3	110	*

*One sample size too small to compute chi-square.

Appendix Table B-11 (Continued)

Number of Belts Used By
Vehicle Age and Area Surveyed

Veh. Age	Occupant Seat Position	Survey Area	1974 Number		1975 Number		chi- square
			Used	Not Used	Used	Not Used	
Post-1971	Driver	Western	93	165	133	365	7.07 p < .01
		Northern	235	391	475	530	14.84 p < .01
		Central	209	462	342	609	4.07 p < .05
		Eastern	87	214	219	454	1.28
	Right Front Passenger	Western	21	60	23	115	2.73
		Northern	66	155	165	225	9.29 p < .01
		Central	43	142	73	193	1.01
		Eastern	16	77	72	210	2.70
	Remaining Passengers	Western	2	40	10	77	*
		Northern	18	73	29	141	0.30
		Central	12	63	13	84	0.23
		Eastern	2	22	7	108	*

*One sample size too small to compute chi-square.

Percent of Belts Used By
Vehicle and Occupant Ages

Vehicle Age	Occupant Seat Position	Age of Occupant	1974 Use	1975 Use
Pre-1962	Driver	Pre-Adult	—	—
		Young Adult	3.9	10.8
		Middle Adult	4.4	14.2
		Older Adult	4.8	16.1
	Right Front Passenger	Pre-Adult	50.0	7.1
		Young Adult	—	5.0
		Middle Adult	5.6	7.7
		Older Adult	—	—
	Remaining Passengers	Pre-Adult	—	5.3
		Young Adult	—	—
		Middle Adult	—	—
		Older Adult	—	—

Appendix Table C-1 (Continued)

Percent of Belts Used By
Vehicle and Occupant Ages

Vehicle Age	Occupant Seat Position	Age of Occupant	1974 Use	1975 Use
1963-1971	Driver	Pre-Adult	—	20.0
		Young Adult	14.0	17.5
		Middle Adult	12.7	17.9
		Older Adult	17.0	19.4
	Right Front Passenger	Pre-Adult	6.1	16.4
		Young Adult	9.7	10.8
		Middle Adult	10.6	18.4
		Older Adult	14.3	17.4
	Remaining Passengers	Pre-Adult	8.8	8.6
		Young Adult	—	9.6
		Middle Adult	2.9	11.3
		Older Adult	25.0	—

Appendix Table C-1 (Continued)

Percent of Belts Used By
Vehicle And Occupant Ages

Vehicle Age	Occupant Seat Position	Age of Occupant	1974 Use	1975 Use
Post-1971	Driver	Pre-Adult	—	20.0
		Young Adult	36.3	41.0
		Middle Adult	31.9	34.3
		Older Adult	32.8	34.4
	Right Front Passenger	Pre-Adult	22.4	19.1
		Young Adult	26.2	33.7
		Middle Adult	24.8	32.9
		Older Adult	27.0	25.6
	Remaining Passengers	Pre-Adult	18.8	13.6
		Young Adult	—	9.0
		Middle Adult	17.4	14.0
		Older Adult	—	14.3

Appendix Table C-2

Percent of Belts Used by
Vehicle Age and Area Surveyed

Vehicle Age	Occupant Seat Position	Survey Area	1974 Use	1975 Use
Pre-1962	Driver	Western	3.3	3.8
		Northern	11.1	20.5
		Central	—	7.0
		Eastern	—	1.9
	Right Front Passenger	Western	4.3	—
		Northern	16.7	8.5
		Central	—	3.4
		Eastern	—	—
	Remaining Passengers	Western	—	—
		Northern	—	5.9
		Central	—	—
		Eastern	—	—

Appendix Table C-2 (Continued)

Percent of Belts Used By
Vehicle Age and Area Surveyed

Vehicle Age	Occupant Seat Position	Survey Area	1974 Use	1975 Use
1963-1971	Driver	Western	15.7	10.5
		Northern	14.2	25.0
		Central	11.0	20.3
		Eastern	11.2	12.2
	Right Front Passenger	Western	10.5	7.0
		Northern	13.4	28.2
		Central	5.3	12.7
		Eastern	7.3	8.0
	Remaining Passengers	Western	8.6	6.9
		Northern	6.1	16.3
		Central	2.5	8.9
		Eastern	4.8	2.7

Appendix Table C-2 (Continued)

Percent of Belts Used By
Vehicle Age and Area Surveyed

Vehicle Age	Occupant Seat Position	Survey Area	1974 Use	1975 Use
Post-1971	Driver	Western	36.0	26.7
		Northern	37.5	47.3
		Central	31.1	36.0
		Eastern	28.9	32.5
	Right Front Passenger	Western	25.9	16.7
		Northern	29.9	42.3
		Central	23.2	27.4
		Eastern	17.2	25.5
	Remaining Passengers	Western	4.8	11.5
		Northern	19.8	17.1
		Central	16.0	13.4
		Eastern	8.3	6.1

