SEAT BELT AND SHOULDER STRAP USE AMONG URBAN TRAVELERS
A Comparison of Survey Results From 1974, 1975, and 1976

by

Charles B. Stoke
Research Analyst

A report prepared by the Virginia Highway and Transportation Research Council under the sponsorship of the Highway Safety Division of Virginia.

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

Charlottesville, Virginia
January 1977
VHTRC 77-R35

ABSTRACT

During nine 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, in February 1975, the survey was repeated, using the same intersection locations, days of the week, and hours of the day. Seat belt usage generally was greater during the second survey. Driver use increased by 3.5% and right front seat passenger use increased by 4.1%. There was no real change in use by the remaining passengers.

A third survey was conducted during February 1976. The same days of the week, hours of the day, and intersection locations were used for this survey as were used for the first two surveys. Occupant use was found to be lower than for either of the preceeding two surveys. In 1976 the use of restraints was 18.2% by drivers, 12.4% by right front passengers, and 5.5% by the remaining passengers.

An association between the driver's use of belts and the right front passenger's use was noted during all three surveys. In vehicles in which the driver was not using a seat belt, 97.2% (1974), 96.3% (1975), and 98.3% (1976) of the right front passengers were not using a seat belt. When the driver was using only a lap belt, 67.0% (1974), 75.4% (1975), and 61.9% (1976) 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, 77.0% (1974), 84.3% (1975), and 73.7% (1976) of the right front passengers were using either the lap belt or the lap and shoulder belts.

It is interesting to note that when the driver was wearing only the lap belt the majority of the right front passengers also were using the lap belt only. When the driver was wearing both the lap and shoulder belts the majority of the right front passengers also were using the lap and shoulder belts (see Table 2). Although no causal effect is assumed from these findings, the high degree of association of use between driver and right front passenger is worth noting.

SEAT BELT AND SHOULDER STRAP USE AMONG URBAN TRAVELERS
A Comparison of Survey Results From 1974, 1975, and 1976

by

Charles B. Stoke
Research Analyst

INTRODUCTION

The safety advantages of wearing seat belts were sufficiently well documented by 1963 that through a statute Virginia began 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.

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 which have been carried out. 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.

A number of investigations have been conducted to determine whether seat belts in motor vehicles are actually being used. Early studies relied on questionnaire and interview formats, while later ones have used a variety of observational techniques. When motorists respond to questions on the use of seat belts they generally give the socially acceptable affirmative reply. When motorists are observed, however, the belt use is found to be less than their stated use.

PURPOSE

This study was inititated to determine the extent to which urban travelers, within the state of Virginia, were using available seat belts and shoulder straps. A second objective was to determine if changes in use occurred over a period of several years.

The information obtained is being used by the Highway Safety Division of Virginia in its programming and planning to increase belt use in the state.

METHOD

In 1974, 1975, and 1976 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, and Thursday and Friday were sampled for two days.

Three sites were used each day. 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 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^{o} angle. Approaching at 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 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 age was recorded by three categories: (1) pre-1963, for which seat belts were not required to be installed in cars sold in Virginia, (2) 1963-1971, and (3) 1972 to present, which included vehicles equipped with buzzer systems, interlocks, etc.

Two changes were made in the collection of data for the 1976 survey. A fourth classification, approved child seat, was added to the category of restraint use; and the pre-adult occupant age category of the 1974 and 1975 surveys was divided into two categories; infants (up to 3 years) and pre-adults (4-16 years).

Figure 1

SAFETY BELT USAGE SURVEY FORM

Date ______________ Start Time ______________ Location ____________________
Sheet No. ______________ Stop Time ______________ At ____________________

Veh. Age	Driver Belts	Driver Sex	Driver Age	Mid Front Belts	Mid Front Sex	Mid Front Age	Rt. Front Belts	Rt. Front Sex	Rt. Front Age	Lt. Rear Belts	Lt. Rear Sex	Lt. Rear Age	Mid Rear Belts	Mid Rear Sex	Mid Rear Age	Rt. Rear Belts	Rt. Rear Sex	Rt. Rear Age
1 2	L S	M	P Y	L S	M	I P Y	L S	M	I P Y	L S	M	I P Y	L S	M	I P Y	L S	M	I P Y
3	N	F	M O	N A	F	M O	N A	F	M O	N A	F	M O	N A	F	M O	N A	F	M O
1 2	L S	M	P Y	L S	M	I P Y	L S	M	I P Y	L S	M	I P Y	L S	M	I P Y	L S	M	I P Y
3	N	F	M O	N A	F	M O	N A	F	M O	N A	F	M O	N A	F	M O	N A	F	M O
1 2	L S	M	P Y	L S	M	I P Y	L S	M	I P Y	L S	M	I P Y	L S	M	I P Y	L S	M	I P Y
3	N	F	M O	N A	F	M O	N A	F	M O	N A	F	M O	N A	F	M O	N A	F	M O
1 2	L S	M	P Y	L S	M	I P Y	L S	M	I P Y	L S	M	I P Y	L S	M	I P Y	L S	M	I P Y
3	N	F	M O	N A	F	M O	N A	F	M O	N A	F	M O	N A	F	M O	N A	F	M O
1 2	L S	M	P Y	L S	M	I P Y	L S	M	I P Y	L S	M	I P Y	L S	M	I P Y	L S	M	I P Y
3	N	F	M O	N A	F	M O	N A	F	M O	N A	F	M O	N A	F	M O	N A	F	M O
1 2	L S	M	P Y	L S	M	I P Y	L S	M	I P Y	L S	M	I P Y	L S	M	I P Y	L S	M	I P Y
3	N	F	M O	N A	F	M O	N A	F	M O	N A	F	M O	N A	F	M O	N A	F	M O
1 2	L S	M	P Y	L S	M	I P Y	L S	M	I P Y	L S	M	I P Y	L S	M	I P Y	L S	M	I P Y
3	N	F	M O	N A	F	M O	N A	F	M O	N A	F	M O	N A	F	M O	N A	F	M O
1 2	L S	M	P Y	L S	M	I P Y	L S	M	I P Y	L S	M	I P Y	L S	M	I P Y	L S	M	I P Y
3	N	F	M O	N A	F	M O	N A	F	M O	N A	F	M O	N A	F	M O	N A	F	M O
1 2	L S	M	P Y	L S	M	I P Y	L S	M	I P Y	L S	M	I P Y	L S	M	I P Y	L S	M	I P Y
3	N	F	M O	N A	F	M O	N A	F	M O	N A	F	M O	N A	F	M O	N A	F	M O
1 2	L S	M	P Y	L S	M	I P Y	L S	M	I P Y	L S	M	I P Y	L S	M	I P Y	L S	M	I P Y
3	N	F	M O	N A	F	M O	N A	F	M O	N A	F	M O	N A	F	M O	N A	F	M O

Vehicle Age

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

Restraint Use

L = Lap
S = Shoulder
N = None
A = Approved Child Seat

Occupant Age

I = Infant (0-3 Yrs.)
P = Pre Adult (4-16 Yrs.)
Y = Young Adult (17-30 Yrs.)
M = Middle Adult (31-60 Yrs.)
O = Older Adult (61 and Up)

An "approved child seat" was defined as those models distributed by the automobile industry, such as the "Love Seat" and "Tot Guard", as well as models sold by other retailers that have the same design characteristics. This category did not include models which hook over the seat or those inadequately anchored, or not anchored at all, to the vehicle.

ANALYSES

During the nine-day survey period in 1974, data were collected on the occupants of 3,440 vehicles. Approximately one year later, in February 1975, 6,150 vehicles were surveyed in the same areas of the state and on the same days of the week. For Phase III (February 1976) of the study, 4,495 vehicles were surveyed at the same locations used in the previous years. Data on the number and percentages of individuals surveyed by time period (Appendix Table A-1), by age of the automobile (Appendix Table A-2), by area of the state (Appendix Table A-3), by sex of the occupant (Appendix Table A-4), and by age of the occupant (Appendix Table A-5) are presented for all three phases of the study.

A review of Appendix Tables A-1 through A-5 reveals a general consistency in survey data across the three years of the study, although there were some variations in several categories of the sampled data. For the time period data, there was a moderate increase each year in the percentage of the morning sample using the restraints accompanied by a decrease in the percentage of the afternoon sample doing so. During 1976 a larger percentage of post-1971 cars and a smaller percentage of 1963-1971 cars were sampled than during the preceding two surveys, but there was an increase in the population of newer cars to be sampled because of new car sales.

The location data were more evenly divided among the four areas of the state during the 1976 survey. This situation resulted in decreases in the percentages of vehicles sampled from the Northern and Central areas, with corresponding increases in the Western and Eastern areas. Also, over the three years of the study there was an increase in the proportion of female drivers and right front passengers sampled. The percentages of the occupant age samples remained nearly constant over the three years of the study.

Seat belt usage declined over the three years of the study (see Table 1). In the 1976 survey there was a decrease from 1975 levels in belt use by all three occupant seat

position categories. The 1976 rates of use, in all but two categories, were even lower than the rates of use in 1974. In one category, driver use of lap and shoulder belts, the 1976 use was higher than the 1974 use, and in the other category, remaining passengers use of lap and shoulder belts, the 1974 and 1976 rates were the same. This is explainable by the larger percentage of post-1971 cars sampled during the third survey. See Appendix Table B-1 for the number of individuals using seat belts, the chi-square values, and the significance levels.

One interesting aspect of the study concerns the association between driver and passenger seat belt use. Table 2 presents percentages of use data 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 not using seat belts most of the passengers also were not using seat belts. The rates of nonuse for right front passengers were 97.2% (1974), 96.3% (1975), and 98.3% (1976), while the nonuse rates for the remaining passengers were 95.9% (1974), 96.8% (1975), and 99.1% (1976). If the drivers were using the lap belt only, right front passengers tended to also use lap belts only: 66.5% (1974), 71.2% (1975), and 60.1% (1976). Total belt use for right front passengers riding with lap belted drivers was 67.1% (1974), 75.4% (1975), and 61.9% (1976); and total belt use for the remaining passengers was 33.8% (1974), 34.9% (1975), and 26.3% (1976). If the driver was using the lap and shoulder belts, right front passengers tended to also use the lap and shoulder belts: 72.1% (1974), 76.5% (1975), and 67.4% (1976). In cars with lap and shoulder belted drivers, total belt use for right front passengers was 77.0% (1974), 84.3% (1975), and 73.7% (1976); and total belt use for remaining passengers was 41.6% (1974), and 30.2% (1975), and 34.8% (1976).

These data show that there is a significant association between the driver use and passenger use of seat belts, especially in the case of the right front passenger. Not only does the right front passenger use belts if the driver uses belts, but he also uses the same belt arrangements, i.e., the lap or the lap and shoulder, as the driver.

Table 1

Percentages of Belt Use by Restraint Used

Occupant Seat Position	Restraint Used	1974 Use	1975 Use	1976 Use
Driver	Lap Only	19.4	17.5	11.2
	Lap and Shoulder	4.6	10.0	7.0
	None	76.0	72.5	81.7
Right Front Passenger	Approved Child Seat	–	–	0.5
	Lap Only	13.3	13.5	7.4
	Lap and Shoulder	4.9	8.8	4.5
	None	81.7	77.6	87.6
Remaining Passengers	Approved Child Seat	–	–	1.4
	Lap Only	9.9	8.7	3.9
	Lap and Shoulder	0.2	1.6	0.2
	None	89.9	89.6	94.5

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	1976	1974	1975	1976	1974	1975	1976
Percentage Right Front Passenger Using	Lap Only	2.0	2.5	0.8	66.5	71.2	60.1	4.9	7.8	6.3
	Lap and Shoulder	0.8	1.3	0.9	0.6	4.2	1.8	72.1	76.5	67.4
	None	97.2	96.3	98.3	32.9	24.6	38.1	23.0	15.7	26.3
Percentage Remaining Passengers Using	Lap Only	4.1	2.5	0.5	33.8	32.2	17.9	33.3	22.1	28.3
	Lap and Shoulder*	–	0.7	0.4	–	2.7	8.4	8.3	8.1	6.5
	None	95.9	96.8	99.1	66.2	65.1	73.7	58.3	69.8	65.2

*Child Seats

Statistical differences in usage rates for the three years of the study occurred in three sets of data (see Appendix Table B-2). In the case of both the right front passengers and the remaining passengers in automobiles in which the driver was not using belts, the use rate for 1976 was lower than for the preceding two years. Only 1.7% of the right front passengers and 0.9% of the remaining passengers were using seat belts during the 1976 survey. When the driver was using only a lap belt, the use rate for right front passengers was lower in 1976 than for the first two surveys. The use rate in 1976 was 61.9%, and although this appears to be a favorably high rate of use, it is lower than the rates in 1974 and 1975.

For two of the remaining sets of data, right front passengers in vehicles with lap and shoulder belted drivers and remaining passengers in vehicles with lap belted drivers, the use rate in 1976 was lower than in 1974 or 1975, but was not statistically different ($p < .05$). The sixth set of data, remaining passengers in vehicles with lap and shoulder belted drivers, showed a nonstatistically significant ($p < .05$) increase in use. The sample size of this set of data was too small to have even a practical significance in belt use results.

The percentages of belt use according to the age of the vehicle and occupant seat position are presented in Table 3. The number of occupants using seat belts, the computed chi-square values, and the significance levels are contained in Appendix Table B-3. The data from the 1976 survey indicate that belt use by drivers of pre-1963 (7.5%), 1963-1971 (11.3%), and post-1971 (22.7%) cars was lower than for the previous years. Belt use by right front passengers in 1963-1971 cars was 7.1% and in post-1971 cars it was 15.6% during the 1976 survey. Belt use by the remaining passengers in 1963-1971 cars was 4.2% and in post-1971 cars it was 6.3% in the third survey. Each of these use rates was lower than that for the earlier surveys. The small belt use sample sizes of the remaining two categories of data preclude statements on variations in use over the three surveys.

Percentages of belt use by the sex of the occupant are presented in Table 4, while Appendix Table B-4 contains the number of belts used, the chi-square values, and the significance levels. In each case the 1976 rate of belt use was lower than that in 1975. The 1975 vs. 1976 belt use data are male drivers, 26.8% vs. 17.2%; female drivers, 28.7% vs. 19.6%; male right front passengers, 18.4% vs. 12.3%; female right front passengers, 24.3% vs. 12.4%; male remaining passengers, 10.1% vs. 7.5%; and female remaining passengers, 10.4% vs. 3.4%. In all but one case the 1976 data were significantly lower ($p < .01$). In the case of male remaining passengers, 1976 belt use results were lower, but not beyond the level

Table 3

Percentage of Belt Use by Vehicle Age

Occupant Seat Position	Vehicle Age	1974 Use	1975 Use	1976 Use
Driver	Pre-'63	4.3	12.7	7.5
	'63-'71	13.5	17.9	11.3
	Post-'71	33.6	37.5	22.7
Right Front Passenger	Pre-'63	4.8	5.2	6.0
	'63-'71	9.9	15.1	7.1
	Post-'71	25.2	30.9	15.6
Remaining Passengers	Pre-63'	–	3.1	–
	'63-'71	6.1	9.1	4.2
	Post-'71	14.7	12.6	6.3

Table 4

Percentage of Belt Use by Sex of Occupant

Occupant Seat Position	Sex of Occupant	1974 Use	1975 Use	1976 Use
Driver	Male	21.1	26.8	17.2
	Female	29.7	28.7	19.6
Right Front Passenger	Male	11.3	18.4	12.3
	Female	22.8	24.3	12.4
Remaining Passengers	Male	11.0	10.1	7.5
	Female	8.9	10.4	3.4

set for statistical signifance. Only in one set of data, male right front passengers, was the 1976 rate of use higher than the 1974 rate and this difference was not statistically significant at $p < .05$.

Table 5 presents the percentages of belt use according to the approximate age of the occupant and Appendix Table B-5 contains the number of belt users and the statistical information. Belt use was lower, in each of the occupant seat positions, during the 1976 survey than during the 1974 and 1975 surveys. In six sets of data, young and middle adult drivers, young and middle adult right front passengers, and pre- and young adult remaining passengers, the rates of use in 1976 were significantly different ($p < .01$) from those of the preceding surveys. These six age/seat position categories make up the majority of occupants in vehicles, and their lower rate of seat belt use is especially significant. For four sets of data, older adult drivers, pre- and older adult right front passengers, and middle adult remaining passengers, the 1976 rates, although lower, did not reach statisitcal signifance at $p < .05$. In two data sets, pre-adult drivers and older adult remaining passengers, the numbers of seat belt users were too small for the computation of chi-squares.

For the 1976 survey, the original pre-adult age category was divided into two categories: infants (0-3 years) and pre-adults (4-16 years). This was done to provide data on belt use for the "Mother Knows Best" campaign being carried out by the Virginia Association of Women Highway Safety Leaders. The rate of use for infant right front passengers was 25.8% and that for infant remaining passengers was 11.9%. There are no data from previous years for making longitudinal comparisons, but comparisons can be made within each seat position category. Infant use rates for right front and remaining passengers are approximately twice those for the other age groups. In interpreting these results, it must be kept in mind that only "approved" devices were counted for the infant use figures. It was felt that because of the negative aspects of some of the devices marketed as child restraints they should not be counted in the "use" figures.

During 1976, driver use rates were 19.0% for young adults, 17.6% for middle adults, and 20.1% for older adults. These values compare to 29.8%, 25.7%, and 26.1% in 1975 and 25.4%, 23.3%, and 21.6% in 1974 for the same age categories. Right front passenger use in 1976 was 14.1% for pre-adults (infants plus pre-adults), 10.8% for young adults, 12.5% for middle adults, and 15.8% for older adults. For the same age categories, rates in 1975 were 17.2%, 22.3%, 25.0%, and 19.2%; and use rates in 1974 were 16.1%, 17.8%, 19.0%, and 20.0%. The use rates by the remaining passengers followed the same downward trend in 1976 as was exhibited by drivers and right front passengers.

Table 5

Percentage of Belt Use by Age of Occupant

Occupant Seat Position	Age of Occupant	1974 Use	1975 Use	1976 Use	
Driver	Pre-Adult	–	20.0	–	
	Young Adult	25.4	29.8	19.0	
	Middle Adult	23.3	25.7	17.6	
	Older Adult	21.6	26.1	20.1	
Right Front Passenger	Infant	–	–	25.8	} 14.1[1]
	Pre-Adult	16.1	17.2	12.2	
	Young Adult	17.8	22.3	10.8	
	Middle Adult	19.0	25.0	12.5	
	Older Adult	20.0	19.2	15.8	
Remaining Passengers	Infant	–	–	11.9	} 6.5[1]
	Pre-Adult	13.6	10.8	5.0	
	Young Adult	–	8.6	2.2	
	Middle Adult	10.7	11.9	5.6	
	Older Adult	6.3	7.0	5.0	

[1]Combined rate of use (infant plus pre-adult).

The percentages of belt use during the three daily time periods are contained in Table 6. The number of occupants using restraints, the chi-square values, and the significance levels are presented in Appendix Table B-6. Belt use during the 1976 survey was significantly lower ($p < .01$) than that for 1974 and 1975 in eight of the nine data categories. These categories include all the driver and passenger groups except for remaining passengers during the afternoon period. Restraint use in 1976 was lower than during the previous two years for this ninth category, but not at the level set for statistical significance ($p < .05$).

In 1976 the rates of driver use were consistent for each of the survey time periods: 18.5% in the morning, 18.0% at midday, and 18.4% in the afternoon. The rates of right front passenger use were 10.8% in the morning, 12.9% at midday, and 12.7% in the afternoon. The rates of use by the remaining passengers were 3.9% in the morning and 5.9% at midday and in the afternoon. In general, the rates of use during the 1974 and 1975 surveys also were relatively consistent throughout the day for each classification of seat position, although these rates were different than the rates for the 1976 survey.

Table 6

Percentages of Belt Use by Time Periods

Occupant Seat Position	Time Period	1974 Use	1975 Use	1976 Use
Driver	A.M.	27.2	28.3	18.5
	MID	23.1	27.6	18.0
	P.M.	22.9	26.9	18.4
Right Front Passenger	A.M.	18.9	21.8	10.8
	MID	19.1	23.5	12.9
	P.M.	17.4	21.3	12.7
Remaining Passengers	A.M.	15.5	12.4	3.9
	MID	9.2	12.1	5.9
	P.M.	8.8	7.9	5.9

Table 7 presents the percentages of belt use according to the area of the state surveyed, and Appendix Table B-7 contains the number of restraints used and the statistical information. The rates of use in 1976 were lower for drivers and right front passengers in all four areas of the state. Remaining passenger use rates in 1976 were lower in the Northern, Western, and Central areas and higher in the Eastern area, but were not statistically different at $p < .05$ in the last three named areas.

The highest rates of use for drivers and passengers during all three surveys were in the Northern area. In 1976 the lowest rates of use by drivers and passengers were in the Western area. In 1975 the lowest rates of use by drivers and right front passengers were also in the Western area, but the lowest use by remaining passengers was in the Eastern area. In 1974 the Western area had the lowest rates of use by drivers and remaining passengers, while the Eastern area had the lowest rate by right front passengers.

The rates of restraint use for drivers during the 1976 survey were 13.5% in the Western area, 25.0% in the Northern area, 16.2% in the Central area, and 18.6% in the Eastern area. Corresponding use rates in 1975 were 17.4%, 36.1%, 27.9%, and 22.8%; rates in 1974 were 21.5%, 27.3%, 23.6%, and 21.7%. Right front passenger use rates in 1976 were 6.9%, 19.8%, 9.7%, and 12.5%; and for the same survey areas, rates were 10.5%, 33.6%, 19.6%, and 16.9% in 1975 and 15.6%, 23.1%, 16.7%, and 13.1% in 1974. Over the three years of the study, only in the Northern area did use rates by remaining passengers vary at a statistically significant level. In this case the rate was 8.2% in 1976, 15.6% in 1975, and 13.5% in 1974.

The data presented in Table 8 show the percentages of belt use while the figures in Appendix Table B-8 show the number of restraints used according to the sex of the occupant and the age of the vehicle and the statistical information. Survey data from 1976 indicate that restraint use by male drivers of 1963-1971 and post-1971 vehicles were lower than in previous years. Belt use rates by male right front passengers of all vehicle age groups and by male remaining passengers of pre-1963 and 1963-1971 age vehicles were the highest during the 1975 survey. For male remaining passengers of post-1971 vehicles, the highest use rate was during the 1974 survey. Rates for the use of restraints by male right front passengers in pre-1963 and 1963-1971 cars and by male remaining passengers in 1963-1971 cars were the lowest during the 1974 survey. Use rates for male right front passengers and male remaining passengers in post-1971 cars were lowest during the 1976 survey. In other categories of data, differences were either not significant or observed uses were too few for statistical computations.

Table 7

Percentages of Belt Use by Area Surveyed

Occupant Seat Position	Survey Area	1974 Use	1975 Use	1976 Use
Driver	Western	21.5	17.4	13.5
	Northern	27.3	36.1	25.0
	Central	23.6	27.9	16.2
	Eastern	21.7	22.8	18.6
Right Front Passenger	Western	15.6	10.5	6.9
	Northern	23.1	33.6	19.8
	Central	16.7	19.6	9.7
	Eastern	13.1	16.9	12.5
Remaining Passengers	Western	6.2	8.8	1.1
	Northern	13.5	15.6	8.2
	Central	11.1	10.5	6.4
	Eastern	8.3	4.1	5.7

Table 8

Percentages of Belt Use By Sex of Occupant and Vehicle Age

Occupant Seat Position		Age of Vehicle	1974 Use	1975 Use	1976 Use
MALE	Driver	Pre-'63	1.1	14.5	3.8
		'63-'71	12.0	17.0	10.0
		Post-'71	31.1	37.2	21.9
	Right Front Passenger	Pre-'63	4.8	8.2	6.5
		'63-'71	4.8	11.3	6.7
		Post-'71	18.2	27.0	15.8
	Remaining Passengers	Pre-'63	–	3.7	–
		'63-'71	6.5	9.4	6.9
		Post-'71	16.2	11.5	8.1
FEMALE	Driver	Pre-'63	18.2	9.9	14.5
		'63-'71	17.2	19.4	12.9
		Post-'71	37.5	37.6	23.7
	Right Front Passenger	Pre-'63	5.0	3.5	5.6
		'63-'71	14.2	17.2	7.3
		Post-'71	28.8	32.7	15.5
	Remaining Passengers	Pre-'63	–	2.6	–
		'63-'71	5.6	8.5	1.9
		Post-'71	12.5	13.5	4.4

Restraint use rates in 1976 by female drivers and female right front passengers of 1963-1971 and post-1971 cars and female remaining passengers in post-1971 cars were lower ($p < .01$) than the use rates observed during the first two surveys. Female drivers and right front passengers in pre-1963 vehicles had the lowest rates of use during the 1975 survey, while female remaining passengers in 1963-1971 vehicles had the lowest rate of use during 1976, but these differences either were not statistically different or the observed uses of restraints were too few for chi-square computations.

For each set of sex vs. vehicle age data, with the exception of female drivers of 1963-1971 vehicles during the 1974 and 1976 surveys and male right front passengers of 1963-1971 vehicles during the 1974 survey, the use of restraints increased as the age of the vehicle decreased. The rate of use by drivers, except for males in pre-1963 cars during the 1974 and 1976 surveys, was greater than that in any of the other occupant seat positions. Female drivers had a higher rate of use than male drivers during each year of the survey and for each vehicle age, with the exception of pre-1963 cars during the 1975 survey. For the other occupant seat positions, there was no pattern of use by sex and year of survey. In general, restraint use rates were greater for newer cars, drivers, and for females. The highest rate of use was by female drivers of new cars.

Survey data on the percentages of belt use by sex and age of the occupants are presented in Table 9, while Appendix Table B-9 contains the use figures and statistical information. In all but three cases where data exist for comparisons, restraint use rates during the third survey were lower than those for either of the two previous surveys. In the first two cases, those of older adult male right front passengers and older adult female drivers, the rates in 1974 and 1976 were the same but lower than during 1975. In the third case, male pre-adult (infants plus pre-adults) right front passengers, the use rate was highest during the 1976 survey.

For male drivers and right front passengers the highest rates of restraint use occurred during the 1975 survey. There were significantly higher ($p < .01$) rates of use in two sets of data: young adult drivers and middle adult right front passengers. For male pre- and middle adult remaining passengers, the highest rates of use were in 1974. There was little difference in the 1974 and 1976 rates of restraint use by the other categories of male drivers and right front passengers. For male remaining passengers there was a decrease in use during 1976 but this lower rate did not reach statistical significance ($p < .05$).

Table 9

Percentage of Belt Use by Sex and Age of Occupants

	Occupant Seat Position	Age of Occupant	1974 Use	1975 Use	1976 Use	
MALE	Driver	Pre-Adult	–	50.0	–	
		Young Adult	20.6	30.3	18.3	
		Middle Adult	21.4	23.9	16.6	
		Older Adult	20.5	26.3	17.7	
	Right Front Passenger	Infant	–	–	33.3	}18.3[1]
		Pre-Adult	14.9	16.8	16.0	
		Young Adult	9.0	14.4	8.9	
		Middle Adult	12.6	27.4	12.4	
		Older Adult	6.7	13.0	6.7	
	Remaining Passengers	Infant	–	–	16.1	}10.2[1]
		Pre-Adult	14.1	10.4	8.6	
		Young Adult	–	7.3	–	
		Middle Adult	14.6	14.3	5.8	
		Older Adult	–	–	–	
FEMALE	Driver	Pre-Adult	–	12.5	–	
		Young Adult	33.3	29.1	19.9	
		Middle Adult	27.3	28.9	19.1	
		Older Adult	24.1	25.8	24.1	
	Right Front Passenger	Infant	–	–	18.8	} 9.8[1]
		Pre-Adult	18.2	17.9	8.3	
		Young Adult	23.7	26.5	11.7	
		Middle Adult	22.5	24.2	12.6	
		Older Adult	23.6	21.1	16.9	
	Remaining Passengers	Infant	–	–	7.1	} 2.4[1]
		Pre-Adult	13.0	11.2	1.0	
		Young Adult	–	9.5	4.0	
		Middle Adult	5.6	10.6	5.5	
		Older Adult	12.5	7.9	6.7	

[1]Combined rate of use (infant plus pre-adult).

For females, middle and older adult drivers, young and middle adult right front passengers, and young and middle adult remaining passengers the highest rates of use were during the 1975 survey, while young adult drivers, pre- and older adult right front passengers, and pre- and older adult remaining passengers had the highest use rates in 1974. There were five significantly lower ($p < .01$) rates of use in 1976 as compared to 1974 and 1975. These were: young and middle adult drivers, young and middle adult right front passengers, and pre-adult (infant plus pre-adult) remaining passengers. In each of the other female/age categories, with the exception of older adult drivers, for which the 1974 and 1976 rates were the same but lower than the 1975 rate, the 1976 rate was lower than in the first two surveys but was not significantly lower at $p < .05$.

Driver use of restraints was greater than that for right front passengers, which in turn was greater than that for remaining passengers. These findings held for each year of the survey and for every occupant age except for male middle adult right front passengers in 1974 and 1975. Over the three years of the study, a higher rate of restraint use did not occur in any category when the comparisons were based on the combination of sex, age, and occupant seat position. For example, male middle adult drivers had the highest use rate in 1974, but the lowest rates in 1975 and 1976; and male middle adult right front passengers had the highest rate of use in 1975 but not in 1974 or 1976.

As was discussed in a previous section of this report, the pre-adult category of 1974 and 1975 was divided into two categories, infant and pre-adult, for 1976. There are no previous data for making comparisons over time for infant use of restraint systems. The data do indicate that the rate of use by male infants is nearly double that of the other male occupant ages, while the use rate by female infants exceeds those of the other female age groups. Even though the infant rates are relatively high, the numbers of users are too few for meaningful comparisons to be made when based on the combination of age, sex, and occupant seat position.

The statistically significant changes in restraint use according to the vehicle and occupant ages are contained in Table 10. The number of occupants using seat belts and the statistical data are in Appendix Table B-10, and the complete data on the percentages of use are presented in Appendix Table C-1. For pre-1963 vehicles, the numbers of observations during all three surveys were too few to permit the computation of chi-square values to test the significance of most of the categories of data. Computations were possible for both young and middle adult drivers, but differences in observed use were not statistically different ($p < .05$).

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	1976 Use
1963 to 1971	Driver	Young Adult	14.0	17.5	10.4
		Middle Adult	12.7	17.9	11.4
	Right Front Passenger	Young Adult	9.7	10.8	4.3
		Middle Adult	10.6	18.4	7.7
	Remaining Passengers	Pre-Adult	8.8	8.6	3.4
Post 1971	Driver	Young Adult	36.3	41.0	24.1
		Middle Adult	31.9	34.3	21.3
	Right Front Passenger	Young Adult	26.2	33.7	14.6
		Middle Adult	24.8	32.9	15.4
	Remaining Passengers	Pre-Adult	18.8	13.6	7.5
		Middle Adult	17.4	14.0	5.2

In the 1963-1971 vehicle age categories, for which chi-square computations could be carried out, use during the 1976 survey was the lowest of any for the three years of the study. Statistically significant differences occurred in five categories of data: young and middle adult drivers, young and middle adult right front passengers, and pre-adult remaining passengers. The rates of use of restraints by these drivers and right front passengers were the highest in 1975 and the lowest in 1976. For remaining passengers, the use was highest in 1974 and lowest in 1976. The 1976 use rates for these groups of vehicle occupants were even lower than the rates during the 1974 survey.

For post-1971 automobiles, use of restraints by each category of occupant was lower during the 1976 survey than during the earlier surveys. There were statistically significant differences in use in six categories: young and middle adult drivers, young and middle adult right front passengers, and pre- and middle adult remaining passengers. The rates of use by these drivers and right front passengers were the highest during 1975, while the rate for remaining passengers was highest in 1974. In the 1976 survey, use rates by the occupants of the newer cars, although greater than those for the other age classes of vehicles, did not exceed 30% for drivers, 22% for right front passengers, or 15% for the remaining passengers. The highest rate of use was in the group with the fewest members, older adults.

The statistically significant changes in seat belt use by vehicle age and area of the state surveyed are presented in Table 11. The reader is referred to Appendix Tables B-11 and C-2 for the full data on the number and percentage of occupants who were observed wearing seat belts.

For pre-1963 automobiles, the numbers of users during all three surveys were too few for chi-square computations to be carried out. Because of the very small numbers, a misclassification of restraint use by one case affects the outcome to such a degree that variations in rates of use are not comparable.

In the 1963-1971 vehicle age category, chi-squares were computed for all but one set of data, remaining passengers in the Eastern area. As a result of these computations, six categories of data were found to be statistically different. For Western and Central drivers and Northern right front passengers, use of restraint systems in 1976 was lower than in 1974 or 1975. For Northern drivers, Central right front passengers, and Northern remaining passengers, the use of seat belts in 1976 was higher than the use in 1974 but significantly lower than that in 1975. In five other categories of data, differences in use did exist over the three years of the survey, but were not significant beyond $p < .05$, which was the standard set for statistical significance.

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	1976 Use
1963 to 1971	Driver	Western	15.7	10.5	6.9
		Northern	14.2	25.0	18.0
		Central	11.0	20.3	9.6
	Right Front Passenger	Northern	13.4	28.2	8.8
		Central	5.3	12.7	6.8
	Remaining Passengers	Northern	6.1	16.3	6.8
Post-1971	Driver	Western	36.0	26.7	17.6
		Northern	37.5	47.3	27.8
		Central	31.1	36.0	23.5
		Eastern	28.9	32.5	21.8
	Right Front Passenger	Western	25.9	16.7	8.8
		Northern	29.9	42.3	23.6
		Central	23.2	27.4	13.7
		Eastern	17.2	25.5	14.5
	Remaining Passengers	Northern	19.8	17.1	8.8

In the post-1971 vehicle age category, chi-squares were computed for all but one set of data, remaining passengers in the Western area. The use rates by drivers and right front passengers of this age category of vehicle were lower in all four areas of the state during the 1976 survey than the use rates during both of the preceding two surveys. The use of seat belts by remaining passengers in the Northern area also was lower in 1976 than in 1974 or 1975. Western, Central, and Eastern area remaining passengers had variations in use over the three years, but these differences did not reach the level set for statistical significance ($p < .05$). The highest rates of use for Northern, Central, and Eastern area drivers and right front passengers and for Western area remaining passengers occurred during the 1975 survey. For all the other area seat position categories, the highest use rates were in 1974.

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 24.0% and passenger use was 15.7%. Of the 2,939 male occupants, 14.7% used a lap belt and an additional 4.1% used lap and shoulder belts. Total belt use by males was 18.7%. Of the 2,005 female occupants, 20.9% used a lap belt and an additional 4.5% used lap and shoulder belts. Total belt use by females was 25.5%.

The 1975 survey included 6,150 passengers 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, 14.7% used a lap belt and an additional 9.3% used lap and shoulder belts. Total belt use by males was 24.1% and was an increase in use over the 1974 rate. Of the 4,308 females surveyed, 16.7% used a lap belt and an additional 8.3% used lap and shoulder belts. Total belt use by females was 25.0%, and practically speaking, this figure represents no change over the 1974 rate.

In the 1976 survey, 4,495 passenger cars containing 6,957 occupants were surveyed. Seat belt use fell to 15.3% of all occupants. Driver use decreased to 18.3% and passenger use decreased to 9.9%. Of the 3,525 males surveyed, 8.5% used a lap belt and an additional 6.9% used lap and shoulder belts. Total restraint use by males decreased to 15.3%. Of the 3,432 females surveyed, 10.4% used a lap belt and an additional 4.9% used lap and shoulder belts. Total restraint use by females decreased to 15.3%. For both males and females, lap belt use was lower in 1976 than in either 1974 or 1975, while 1976 lap and shoulder belt use was higher than in 1974 but lower than in 1975.

There are a number of findings which can be generalized from the results of the three years of the study.

1. There was a significant association between driver and passenger use of restraints, with the right front passenger tending to use the same belt arrangement as the driver.

2. The rates of restraint use generally were lower for all classifications of data during the 1976 survey.

3. Lap belts were used more often than lap and shoulder belts.

4. Within vehicle age classifications, the rates of belt use were highest for the newest cars during all three surveys and at each occupant seat position.

5. In the 1976 survey, the only one with an infant classification, infants were using restraints at a higher rate than were the other occupant age groups, but less than 15% (22 out of 149) of all infants were so restrained in "approved child seats".

6. There was little difference in restraint use when classified by time of day.

7. Restraint use was highest in the Northern area and generally lowest in the Western area.

8. For each vehicle age classification, female drivers tended to have a slightly higher rate of use than did male drivers.

9. Driver use of restraints was generally greater than use by right front passengers, who in turn used restraints more than did remaining passengers.

Changes in belt use occurred in a number of other categories throughout the three years of the study, but when the chi-square was computed the results did not meet the minimum standard set for significance ($p < .05$). In some data sets the changes in rates of use appear large, but the numbers of observed users were too few for statistical analyses to be carried out on the data.

Most of the categories of data for which statistics could be computed had chi-square values which indicated significant differences at $p < .01$. In the great majority of these cases, the rate of use in 1976 was lower than the use levels of 1974 and 1975. In some others, the 1976 rate was lower than that for 1975 but higher than that for 1974; and in a few sets, the 1975 rate was higher than those for 1974 or 1976.

ACKNOWLEDGEMENTS

Appreciation is expressed to Dave Hill, Rob Jordan, Harriett Toms, and Joyce Furrow, who, along with the author, served as data collectors during the third year of the study. Thanks are expressed to personnel in the Research Council's Data Section, especially to Sarah Kelley who did the keypunching and Joe Blair who updated and ran the program. Also the author appreciates the efforts of Toni Thompson, who typed the several drafts of the report and the other members of the Safety Section for their editorial review and comments and general assistance. Acknowledgement is made of the role of Harry Craft, the Council editor, and his staff in the preparation of the final report.

Appendix Table A-1

1974, 1975, and 1976 Time Period Data

Time Periods	1974		1975		1976	
	No.	% Total	No.	% Total	No.	% Total
Morning	887	25.8	1,613	26.2	1,302	29.0
Midday	1,122	32.6	2,348	38.2	1,662	37.0
Afternoon	1,431	41.6	2,189	35.6	1,531	34.0

Appendix Table A-2

1974, 1975, and 1976 Vehicle Age Data

Vehicle Age	1974		1975		1976	
	No.	% Total	No.	% Total	No.	% Total
Pre-1963	117	3.4	330	5.4	160	3.6
1963-1971	1,467	42.7	2,693	43.8	1,529	34.0
Post-1971	1,856	53.9	3,127	50.9	2,806	62.4

Appendix Table A-3

1974, 1975, and 1976 Location Data

Location	1974		1975		1976	
	No.	% Total	No.	% Total	No.	% Total
Western	776	22.6	1,136	18.5	1,165	25.9
Northern	1,111	32.2	1,952	31.7	1,078	24.0
Central	1,059	30.8	1,820	29.6	1,002	22.3
Eastern	494	14.4	1,242	20.2	1,250	27.8

Appendix Table A-4

1974, 1975, and 1976 Sex of Occupant Data

Occupant Seat Position	Sex of Occupant	1974		1975		1976	
		No.	%	No.	%	No.	%
Driver	Female	1,180	34.3	2,329	37.9	1,914	42.6
	Male	2,260	65.7	3,821	62.1	2,581	57.4
Right Front Passenger	Female	628	60.7	1,441	66.6	1,077	68.0
	Male	407	39.3	722	33.4	506	32.0
Remaining Passengers	Female	192	42.2	537	54.6	441	50.2
	Male	263	57.8	447	45.4	438	49.8

Appendix Table A-5

1974, 1975, and 1976 Age of Occupant Data

Occupant Seat Position	Age of Occupant	1974		1975		1976	
		No.	%	No.	%	No.	%
Driver	Pre-Adult	0	–	10	0.2	2	0.04
	Young Adult	1,334	38.8	2,663	43.3	1,698	37.8
	Middle Adult	1,930	56.1	3,060	49.8	2,561	57.0
	Older Adult	176	5.1	417	6.8	234	5.2
Right Front Passenger	Infant	–	–	–	–	31	2.0
	Pre-Adult	118	11.4	290	13.4	196	12.4
	Young Adult	416	40.2	912	42.2	585	37.0
	Middle Adult	431	41.6	763	35.3	638	40.3
	Older Adult	70	6.8	198	9.2	133	8.4
Remaining Passengers	Infant	–	–	–	–	118	13.4
	Pre-Adult	264	58.0	574	58.3	419	47.7
	Young Adult	91	20.0	233	23.7	180	20.5
	Middle Adult	84	18.5	135	13.7	142	16.2
	Older Adult	16	3.5	43	4.4	20	2.3

Appendix Table B-1

Number of Belts Used by Restraint Used

Occupant Seat Position	Restraint Used	1974 No.	1975 No.	1976[1] No.	Chi-Square
Driver	Lap Only	668	1,076	505	214.13
	Lap and Shoulder	159	616	316	$p < .01$
	None	2,613	4,458	3,674	
Right Front Passenger	Approved Child Seat	–	–	8	
	Lap Only	138	293	117	71.55
	Lap and Shoulder	51	191	71	$p < .01$
	None	846	1,681	1,387	
Remaining Passengers	Approved Child Seat	–	–	12	
	Lap Only	45	86	34	18.28[2]
	Lap and Shoulder	1	16	2	$p < .01$
	None	409	883	831	

[1]For 1976, child seat data combined with lap and shoulder data in computation of chi-square.

[2]1974 data not used in computation.

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	1976	1974	1975	1976	1974	1975	1976
Number Right Front Passengers Using	Lap Only	16	40	10	119	237	101	3	16	6
	Lap and Shoulder	6	21	12	1	14	3	44	156	64
	None	773	1,567	1,298	59	82	64	14	32	25
	Chi-Square	14.43 $p < .01$			10.54[1] $p < .01$			4.78[2]		
Number Remaining Passengers Using	Lap Only	15	19	4	26	48	17	4	19	13
	Lap and Shoulder	0	5*	3	0	4*	8	1*	7*	3
	None	351	726	731	51	97	70	7	60	30
	Chi-Square	12.72[1] $p < .01$			2.09[1]			0.77[1]		

[1]Belt use combined for computation of chi-square.
[2]1975 vs. 1976.
*Child seat.

Appendix Table B-3

Number of Belts Used by Vehicle Age

Occupant Seat Position	Vehicle Age	1974 Number		1975 Number		1976 Number		Chi-Square
		Used	Not Used	Used	Not Used	Used	Not Used	
Driver	Pre-'63	5	112	42	288	12	148	8.25 $p < .05$
	'63-'71	198	1,269	481	2,212	173	1,356	36.22 $p < .01$
	Post-'71	624	1,232	1,169	1,958	636	2,170	156.03 $p < .01$
Right Front Passenger	Pre-'63	2	40	7	128	4	63	0.05 [1]
	'63-'71	41	372	144	810	37	483	22.36 $p < .01$
	Post-'71	146	434	333	743	155	841	67.96 $p < .01$
Remaining Passengers	Pre-'63	0	26	2	63	0	24	*
	'63-'71	12	185	41	410	12	273	6.71 $p < .05$
	Post-'71	34	198	59	410	36	534	17.39 $p < .01$

*One sample size too small for computation of chi-square.
[1]1975 vs. 1976.

Appendix Table B-4

Number of Belts Used by Sex of Occupant

Occupant Seat Position	Sex of Occupant	1974 Number		1975 Number		1976 Number		Chi-Square
		Used	Not Used	Used	Not Used	Used	Not Used	
Driver	Male	476	1,784	1,022	2,798	445	2,136	83.41 $p < .01$
	Female	351	829	669	1,660	376	1,538	57.96 $p < .01$
Right Front Passenger	Male	46	361	133	589	62	444	14.10 $p < .01$
	Female	143	485	350	1,091	134	943	58.17 $p < .01$
Remaining Passengers	Male	29	234	45	402	33	405	2.85
	Female	17	175	56	481	15	426	17.78 $p < .01$

Appendix Table B-5

Number of Belts Used by Age of Occupant

Occupant Seat Position	Age of Occupant	1974 Number		1975 Number		1976 Number		Chi-Square
		Used	Not Used	Used	Not Used	Used	Not Used	
Driver	Pre-Adult	0	0	2	8	0	2	*
	Young Adult	339	995	794	1,869	323	1,375	63.50 $p < .01$
	Middle Adult	450	1,480	786	2,273	451	2,110	53.92 $p < .01$
	Older Adult	38	138	109	308	47	187	3.49
Right Front Passenger	Infant	–	–	–	–	8 [1]	23 [1]	0.95
	Pre-Adult	19	99	50	240	24	172	
	Young Adult	74	342	203	709	63	522	32.19 $p < .01$
	Middle Adult	82	349	191	572	80	558	34.89 $p < .01$
	Older Adult	14	56	38	160	21	112	0.80
Remaining Passengers	Infant	–	–	–	–	14 [1]	104 [1]	11.70 $p < .01$
	Pre-Adult	36	228	62	512	21	398	
	Young Adult	0	91	20	213	4	176	7.51[2] $p < .01$
	Middle Adult	9	75	16	118	8	134	3.61
	Older Adult	1	15	3	40	1	19	*

*One sample size too small for computation of chi-square.
[1]Infant and pre-adult 1976 data combined for computation of chi-square.
[2]1975 vs. 1976.

Appendix Table B-6

Number of Belts Used by Time Periods

Occupant Seat Position	Time Period	1974 Number		1975 Number		1976 Number		Chi-Square
		Used	Not Used	Used	Not Used	Used	Not Used	
Driver	A.M.	241	646	456	1,157	241	1,061	40.82 $p < .01$
	MID	259	863	647	1,701	299	1,363	49.68 $p < .01$
	P.M.	327	1,104	589	1,600	281	1,250	37.11 $p < .01$
Right Front Passenger	A.M.	38	163	87	312	35	288	15.43 $p < .01$
	MID	65	275	220	716	88	596	29.03 $p < .01$
	P.M.	86	408	177	653	73	503	17.52 $p < .01$
Remaining Passengers	A.M.	13	71	19	134	7	173	11.75 $p < .01$
	MID	12	119	50	364	23	369	9.41 $p < .01$
	P.M.	21	219	33	385	18	289	1.83

Appendix Table B-7

Number of Belts Used by Area Surveyed

Occupant Seat Position	Survey Area	1974 Number		1975 Number		1976 Number		Chi-Square
		Used	Not Used	Used	Not Used	Used	Not Used	
Driver	Western	167	609	198	938	157	1,008	21.67 $p < .01$
	Northern	303	808	704	1,248	270	808	48.59 $p < .01$
	Central	250	809	507	1,313	162	840	48.86 $p < .01$
	Eastern	107	387	283	959	232	1,018	6.99 $p < .01$
Right Front Passenger	Western	34	184	37	314	26	349	11.26 $p < .01$
	Northern	87	289	253	499	74	300	28.94 $p < .01$
	Central	48	240	104	427	28	262	13.66 $p < .01$
	Eastern	20	133	90	441	68	476	4.58
Remaining Passengers	Western	8	121	17	177	2	188	0.71[1]
	Northern	22	141	53	286	19	213	6.93 $p < .05$
	Central	13	104	22	187	8	117	2.00
	Eastern	3	33	10	233	19	313	0.76[2]

[1]1974 vs. 1975.
[2]1975 vs. 1976.

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		1976 Number		Chi-Square
			Used	Not Used	Used	Not Used	Used	Not Used	
MALE	Driver	Pre-'63	1	94	35	206	4	101	8.39[1] p < .01
		'63-'71	124	913	288	1,409	85	764	27.41 p < .01
		Post-'71	351	777	701	1,183	356	1,271	97.44 p < .01
	Right Front Passenger	Pre-'63	1	20	4	45	2	29	*
		'63-'71	9	179	38	298	11	154	7.52 p < .05
		Post-'71	36	162	91	246	49	261	13.37 p < .05
	Remaining Passengers	Pre-'63	0	19	1	26	0	12	*
		'63-'71	7	101	19	184	9	121	1.06
		Post-'71	22	114	25	192	24	272	6.34 p < .05
FEMALE	Driver	Pre-'63	4	18	9	82	8	47	1.43
		'63-'71	74	356	193	803	88	592	11.99 p < .01
		Post-'71	273	455	467	775	280	899	64.28 p < .01
	Right Front Passenger	Pre-'63	1	19	3	83	2	34	*
		'63-'71	32	193	106	511	26	329	18.58 p < .01
		Post-'71	110	272	241	497	106	580	58.80 p < .01
	Remaining Passengers	Pre-'63	0	8	1	37	0	12	*
		'63-'71	5	84	21	226	3	152	0.76[2]
		Post-'71	12	84	34	218	12	262	14.25 p < .01

*One sample size too small for computation of chi-square.
[1]1975 vs. 1976
[2]1974 vs. 1975

Appendix Table B-9

Number of Belts Used by Sex and Age of Occupants

	Occupant Seat Position	Age of Occupant	1974 Number		1975 Number		1976 Number		Chi-Square
			Used	Not Used	Used	Not Used	Used	Not Used	
MALE	Driver	Pre-Adult	0	0	1	1	0	0	*
		Young Adult	170	656	483	1,110	168	751	55.09 p < .01
		Middle Adult	281	1,031	462	1,474	251	1,264	27.73 p < .01
		Older Adult	25	97	76	213	26	121	4.57
	Right Front Passenger	Infant	–	–	–	–	5 [1]	10 [1]	
		Pre-Adult	11	63	26	129	16 [1]	84 [1]	0.37
		Young Adult	15	152	46	274	17	174	4.91
		Middle Adult	19	132	55	146	23	162	18.77 p < .01
		Older Adult	1	14	6	40	1	14	*
	Remaining Passengers	Infant	–	–	–	–	10 [1]	52 [1]	
		Pre-Adult	22	134	31	266	19 [1]	202 [1]	1.76
		Young Adult	0	51	7	89	0	81	*
		Middle Adult	7	41	7	42	4	65	3.11
		Older Adult	0	8	0	5	0	5	*
FEMALE	Driver	Pre-Adult	0	0	1	7	0	2	*
		Young Adult	169	339	311	759	155	624	32.42 p < .01
		Middle Adult	169	449	324	799	200	846	30.06 p < .01
		Older Adult	13	41	33	95	21	66	0.10
	Right Front Passenger	Infant	–	–	–	–	3 [1]	13 [1]	
		Pre-Adult	8	36	24	110	8 [1]	88 [1]	3.62
		Young Adult	59	190	157	435	46	348	32.34 p < .01
		Middle Adult	63	217	136	426	57	396	23.02 p < .01
		Older Adult	13	42	32	120	20	98	1.25
	Remaining Passengers	Infant	–	–	–	–	4 [1]	52 [1]	
		Pre-Adult	14	94	31	246	2 [1]	196 [1]	18.46 p < .01
		Young Adult	0	40	13	124	4	95	2.55[2]
		Middle Adult	2	34	9	76	4	69	1.36[2]
		Older Adult	1	7	3	35	1	14	*

*One sample size too small for computation of chi-square.
[1]Infant and pre-adult 1976 data combined for computation of chi-square.

Appendix Table B-10

Number of Belts Used by Vehicle and Occupant Ages

Vehicle Age	Occupant Seat Position	Age of Occupant	1974 Number		1975 Number		1976 Number		Chi-Square
			Used	Not Used	Used	Not Used	Used	Not Used	
Pre-1963	Driver	Pre-Adult	0	0	0	0	0	0	*
		Young Adult	2	49	17	141	5	66	0.78[2]
		Middle Adult	2	43	20	121	7	67	0.99[2]
		Older Adult	1	20	5	26	0	15	*
	Right Front Passenger	Infant	–	–	–	–	1 }[1]	1 }[1]	*
		Pre-Adult	1	1	1	13	1	8	*
		Young Adult	0	17	3	57	0	20	*
		Middle Adult	1	17	3	36	1	26	*
		Older Adult	0	5	0	22	1	8	*
	Remaining Passengers	Infant	–	–	–	–	0 }[1]	0 }[1]	*
		Pre-Adult	0	13	2	36	0	7	*
		Young Adult	0	9	0	18	0	14	*
		Middle Adult	0	3	0	6	0	3	*
		Older Adult	0	1	0	3	0	0	*

*One sample size too small for computation of chi-square.
[1]Infant and pre-adult 1976 data combined for computation of chi-square.
[2]1975 vs. 1976.

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		1976 Number		Chi-Square
			Used	Not Used	Used	Not Used	Used	Not Used	
1963-1971	Driver	Pre-Adult	0	0	1	4	0	2	*
		Young Adult	81	496	186	879	57	489	14.49 p < .01
		Middle Adult	102	700	257	1,175	99	766	21.75 p < .01
		Older Adult	15	73	37	154	17	99	1.13
	Right Front Passenger	Infant	–	–	–	–	3 [1]	7 [1]	1.56
		Pre-Adult	3	46	23	117	5	63	
		Young Adult	18	167	41	339	8	179	6.75 p < .05
		Middle Adult	16	135	64	283	15	180	13.78 p < .01
		Older Adult	4	24	15	71	6	54	1.59
	Remaining Passengers	Infant	–	–	–	–	5 [1]	33 [1]	6.39 p < .01
		Pre-Adult	10	103	22	234	3	193	
		Young Adult	0	45	10	94	1	58	*
		Middle Adult	1	34	8	63	3	39	*
		Older Adult	1	3	0	19	0	13	*

*One sample size too small for computation of chi-square.
[1]Infant and pre-adult 1976 data combined for computation of 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		1976 Number		Chi-Square
			Used	Not Used	Used	Not Used	Used	Not Used	
Post-1971	Driver	Pre-Adult	0	0	1	4	0	0	*
		Young Adult	256	450	591	849	261	820	79.68 $p < .01$
		Middle Adult	346	737	509	977	345	1,277	71.83 $p < .01$
		Older Adult	22	45	67	128	30	73	0.84
	Right Front Passenger	Infant	–	–	–	–	4 [1]	15 [1]	1.31
		Pre-Adult	15	52	26	110	18	101	
		Young Adult	56	158	159	313	55	323	40.68 $p < .01$
		Middle Adult	65	197	124	253	64	352	33.38 $p < .01$
		Older Adult	10	27	23	67	14	50	0.42
	Remaining Passengers	Infant	–	–	–	–	9 [1]	71 [1]	13.82 $p < .01$
		Pre-Adult	26	112	38	242	18	261	
		Young Adult	0	37	10	101	3	104	*
		Middle Adult	8	38	8	49	5	92	6.03 $p < .05$
		Older Adult	0	11	3	18	1	6	*

*One sample size too small for computation of chi-square.
[1]Infant and pre-adult 1976 data combined for computation of 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		1976 Number		Chi-Square
			Used	Not Used	Used	Not Used	Used	Not Used	
Pre-1963	Driver	Western	2	58	1	25	5	70	*
		Northern	3	24	34	132	4	13	0.09[1]
		Central	0	16	6	80	3	39	*
		Eastern	0	14	1	51	0	26	*
	Right Front Passenger	Western	1	22	0	12	1	30	*
		Northern	1	5	6	65	2	3	*
		Central	0	8	1	28	1	18	*
		Eastern	0	5	0	23	0	12	*
	Remaining Passengers	Western	0	17	0	5	0	7	*
		Northern	0	6	2	32	0	2	*
		Central	0	2	0	11	0	7	*
		Eastern	0	1	0	15	0	8	*

*One sample size too small for computation of chi-square.
[1]1975 vs. 1976.

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		1976 Number		Chi-Square
			Used	Not Used	Used	Not Used	Used	Not Used	
1963-1971	Driver	Western	72	386	64	548	26	349	16.60 $p < .01$
		Northern	65	393	195	586	53	242	21.98 $p < .01$
		Central	41	331	159	624	46	433	32.75 $p < .01$
		Eastern	20	159	63	454	48	332	0.24
	Right Front Passenger	Western	12	102	14	187	5	113	3.47
		Northern	20	129	82	209	9	93	23.66 $p < .01$
		Central	5	90	30	206	10	137	6.10 $p < .05$
		Eastern	4	51	18	208	13	140	0.09
	Remaining Passengers	Western	6	64	7	95	0	59	0.17[1]
		Northern	4	62	22	113	4	55	6.24 $p < .05$
		Central	1	39	9	92	4	70	0.76[2]
		Eastern	1	20	3	110	4	89	*

*One sample size too small for computation of chi-square.
[1]1974 vs. 1975.
[2]1975 vs. 1976.

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		1976 Number		Chi-Square
			Used	Not Used	Used	Not Used	Used	Not Used	
Post-1971	Driver	Western	93	165	133	365	126	589	38.54 p < .01
		Northern	235	391	475	530	213	553	69.83 p < .01
		Central	209	462	342	609	113	368	23.07 p < .01
		Eastern	87	214	219	454	184	660	22.63 p < .01
	Right Front Passenger	Western	21	60	23	115	20	206	14.97 p < .01
		Northern	66	155	165	225	63	204	26.66 p < .01
		Central	43	142	73	193	17	107	8.97 p < .05
		Eastern	16	77	72	210	55	324	12.99 p < .01
	Remaining Passengers	Western	2	40	10	77	2	122	*
		Northern	18	73	29	141	15	156	7.53 p < .05
		Central	12	63	13	84	4	40	1.14
		Eastern	2	22	7	108	15	216	0.02[2]

*One sample size too small for computation of chi-square.
[2]1975 vs. 1976.

Appendix Table C-1

Percentage of Belts Used by Vehicle and Occupant Ages

Vehicle Age	Occupant Seat Position	Age of Occupant	1974 Use	1975 Use	1976 Use
Pre-1963	Driver	Pre-Adult	–	–	–
		Young Adult	3.9	10.8	7.0
		Middle Adult	4.4	14.2	9.5
		Older Adult	4.8	16.1	–
	Right Front Passenger	Infant	–	–	50.0
		Pre-Adult	50.0	7.1	11.1
		Young Adult	–	5.0	–
		Middle Adult	5.6	7.7	3.7
		Older Adult	–	–	11.1
	Remaining Passengers	Infant	–	–	–
		Pre-Adult	–	5.3	–
		Young Adult	–	–	–
		Middle Adult	–	–	–
		Older Adult	–	–	–
1963-1971	Driver	Pre-Adult	–	20.0	–
		Young Adult	14.0	17.5	10.4
		Middle Adult	12.7	17.9	11.4
		Older Adult	17.0	19.4	14.7
	Right Front Passenger	Infant	–	–	30.0
		Pre-Adult	6.1	16.4	7.4
		Young Adult	9.7	10.8	4.3
		Middle Adult	10.6	18.4	7.7
		Older Adult	14.3	17.4	10.0
	Remaining Passengers	Infant	–	–	13.2
		Pre-Adult	8.8	8.6	1.5
		Young Adult	–	9.6	1.7
		Middle Adult	2.9	11.3	7.3
		Older Adult	25.0	–	–
Post-1971	Driver	Pre-Adult	–	20.0	–
		Young Adult	36.3	41.0	24.1
		Middle Adult	31.9	34.3	21.3
		Older Adult	32.8	34.4	29.1
	Right Front Passenger	Infant	–	–	21.1
		Pre-Adult	22.4	19.1	15.1
		Young Adult	26.2	33.7	14.6
		Middle Adult	24.8	32.9	15.4
		Older Adult	27.0	25.6	21.9
	Remaining Passengers	Infant	–	–	11.3
		Pre-Adult	18.8	13.6	6.5
		Young Adult	–	9.0	2.8
		Middle Adult	17.4	14.0	5.2
		Older Adult	–	14.3	14.3

Appendix Table C-2

Percentage of Belts Used by Vehicle Age and Area Surveyed

Vehicle Age	Occupant Seat Position	Survey Area	1974 Use	1975 Use	1976 Use
Pre-1963	Driver	Western	3.3	3.8	6.7
		Northern	11.1	20.5	23.5
		Central	–	7.0	7.1
		Eastern	–	1.9	–
	Right Front Passenger	Western	4.3	–	3.2
		Northern	16.7	8.5	40.0
		Central	–	3.4	5.3
		Eastern	–	–	–
	Remaining Passengers	Western	–	–	–
		Northern	–	5.9	–
		Central	–	–	–
		Eastern	--	--	–
1963-1971	Driver	Western	15.7	10.5	6.9
		Northern	14.2	25.0	18.0
		Central	11.0	20.3	9.6
		Eastern	11.2	12.2	12.6
	Right Front Passenger	Western	10.5	7.0	4.2
		Northern	13.4	28.2	8.8
		Central	5.3	12.7	6.8
		Eastern	7.3	8.0	8.5
	Remaining Passengers	Western	8.6	6.9	--
		Northern	6.1	16.3	6.8
		Central	2.5	8.9	5.4
		Eastern	4.8	2.7	4.3
Post-1971	Driver	Western	36.0	26.7	17.6
		Northern	37.5	47.3	27.8
		Central	31.1	36.0	23.5
		Eastern	28.9	32.5	21.8
	Right Front Passenger	Western	25.9	16.7	8.8
		Northern	29.9	42.3	23.6
		Central	23.2	27.4	13.7
		Eastern	17.2	25.5	14.5
	Remaining Passengers	Western	4.8	11.5	1.6
		Northern	19.8	17.1	8.8
		Central	16.0	13.4	9.1
		Eastern	8.3	6.1	6.5