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1995 SAFETY BELT USAGE SURVEY AND EVALUATION OF EFFECTIVENESS IN KENTUCKY

by

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16. Abstract

The objective of this study was to establish 1995 safety belt and child safety seat usage rates in Kentucky. The 1995 survey documents the continuing results from enacting a statewide mandatory safety belt law in 1994. Data were collected at 100 sites and combined based on vehicle miles travelled for a given type of highway, rural or urban location, and county population category. Also included in this report is an analysis of accident records evaluating the effectiveness of safety belts.

The data show that the dramatic increase in usage rates after enactment of the statewide law has decreased a small amount. Rates still remain significantly above the 1993 level of 42 percent. The usage rates for drivers decreased from 58 percent in 1994 to 54 percent in 1995. While the usage rate for drivers had increased for the past several years, the amount of the increase was decreasing prior to enactment of the statewide law.

The statewide usage rate for children under the age of four was determined to be 66 percent. This represents a decrease from the 72 percent usage determined in the 1994 survey.

Benefits in the reduction of injuries for occupants involved in police-reported accidents wearing a safety belt or in a safety seat were shown through the analysis of accident records. For example, a 59 percent reduction in fatal or incapacitating injuries was determined for drivers wearing a safety belt compared to those who were not restrained.

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INTRODUCTION

The use of safety belts and child safety seats is an effective means of reducing injuries to motor-vehicle occupants involved in a traffic accident. There have been various types of efforts used to increase safety belt and safety seat usage. Past efforts have included public information campaigns and both local and statewide legislation. The most recent legislation in this area was statewide legislation requiring the use of safety belts. This law was passed in 1994 with an effective date in July 1994.

The first legislation in this area was a law enacted by the 1982 Kentucky General Assembly requiring use of a "child restraint system" for children 40 inches or less in height. The 1988 Kentucky General Assembly strengthened the child restraint law to include a $50 fine for violation of the law. Also, prior to the statewide law, local safety belt usage laws were enacted in several local jurisdictions in Kentucky. The first such local law, with an effective date of July 1990, was enacted by the Lexington-Fayette Urban County Government. The second local law, with an effective date of July 1991, was enacted by the city of Louisville. Jefferson County later adopted such a law. Other cities and one county which had local safety belt ordinances prior to the statewide legislation included Murray, Bowling Green, Kenton County, Corbin, Bardstown, and Midway. Prior to the statewide law, the combined population of the counties and cities having a local ordinance represented approximately one-third of the statewide population. The statewide law replaced the various local ordinances.

Statewide observational surveys were first conducted in Kentucky in 1982 with data collected in 19 cities across the state. These surveys have been conducted annually since 1982 (with the exception of 1987) to document safety belt and safety seat usage in Kentucky (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12). The number of sites was increased in 1990 in order to obtain a more representative statewide sample (8).

Statewide usage of child safety seats or safety belts for children under 4 years of age increased from about 15 percent in 1982, before enactment of the mandatory child restraint law, to about 30 percent in 1984 and stayed at this level in 1985 and 1986. After a penalty was added to the law, this percentage increased to almost 50 percent in 1988 and 1989 and to 57 percent in 1990 and 1991. The 1993 survey indicated a usage rate of 61 percent with usage increasing to 72 percent in 1994. Safety belt usage for the driver has increased each survey year from 1982 through 1994. The statewide driver safety belt usage rate was only 4 percent in 1982. It steadily increased to a level of approximately 40 percent in 1991 through 1993. There was a large increase to 58 percent in 1994 after enactment of the statewide law.

The objective of the survey summarized in this report is to establish statewide 1995 safety belt and child safety seat usage rates in Kentucky. These rates may be compared to those determined from previous surveys. The 1995 survey will determine whether the large increase in usage obtained from enacting a statewide mandatory safety belt law in 1994 has been maintained. Another objective of this study is to analyze accident data to evaluate the effectiveness of safety belts in reducing injuries to occupants of motor vehicles involved in traffic accidents.

PROCEDURE

DATA COLLECTION PROCEDURE

The data collection procedure used in the surveys was modified starting with the 1990 survey. The procedure used in the 1990 through 1994 surveys was again used in the 1995 survey. The procedure used for the first several surveys was changed in order to obtain a more representative statewide sample as well as to use a procedure that would be comparable to surveys taken in other states. The data collection form was changed along with the site selection procedure.

The data collection form used in the survey is shown in Figure 1. Safety belt usage was recorded for drivers and front-seat passengers sitting in the outboard position. These positions are equipped with a combination lap belt/shoulder harness which enables observations to be performed more easily. The exception was for children under four years of age for which data were collected for all positions in the front and the rear seats. Drivers were classified into three age categories and were classified by sex. Passengers were classified into several age categories. For drivers and front-seat passengers (over three years of age), usage was classified as either using a harness or belt or no restraint. For children one to three years of age, the categories included safety seat, booster seat, harness or belt, or no restraint. For children under one year of age, the categories were either safety seat or no restraint. When a safety seat was used, an attempt was made to determine if there was an obvious misuse.

Two additional types of information were obtained. This information was collected first in the 1993 survey. Use of motorcycle helmets was noted. Also, usage was determined for minority drivers.

The following list of guidelines for data collection was given to each observer, and each data collector went through a training period.

1. Always include the driver so the number of vehicles included in the sample will be known.

2. Include all vehicles at low-volume locations. When taking data on a multi-lane road, generally include only vehicles in the curb or near lane unless the traffic volume and roadway geometrics allow data to be collected in the next lane.

3. Collect data on only one approach at the intersection.

4. If traffic volume is too heavy to collect data for all vehicles, record data for the next vehicle in view after recording data for the prior vehicle.

5. Obtain a random sample of vehicles independent of whether the occupants are wearing a safety belt. Do not attempt to include all vehicles having an occupant wearing a safety belt at a location where all vehicles cannot be obtained.

6. Attempt to include data for children under four years of age for any vehicle in the sample in which such a child is a passenger.

7. Only include vehicles either stopped or moving so slowly that occupants can be readily observed.

8. Excluding children under four years of age, collect data only for drivers and passengers in the right-front seat (exclude the center front and rear seating positions).

9. Do not include old passenger cars not equipped with a safety belt (those without a head rest).

10. Collect data during daylight hours on weekdays and weekends.

11. Collect data for four hours at each site.

12. Begin and end data collection at a specified time not considering whether the occupants are using a safety belt.

13. Collect data for cars, vans, and light trucks.

14. Do not include a vehicle in the count when use by the driver cannot be determined.

As noted, data were collected for four hours at each location. The decision was made to collect data for an equal time period for each location rather than attempt to collect a given sample size.

Data collection was started in April 1995 and continued through September with the majority of the data obtained in June through August.

DATA COLLECTION LOCATIONS

Data for the surveys collected from 1982 through 1989 were conducted at 23 sites in 19 cities. The cities were selected so that they would be distributed across the state. These cities were also selected to represent a range of population categories to account for social and economic factors. In order to be able to relate the survey results to data taken in other states and to include all types of roadways, it was necessary to expand the number of sites to include data in rural locations and for interstates. The distribution of the sites was based on vehicle miles travelled statewide for various categories of roads in counties of varying populations. The variables considered were the rural or urban designation of the road, the functional classification of the road, and the county population. This was done so that roads would be stratified to assure a proper representation of urban and rural areas and different road types. The percentages of vehicle miles travelled on various types of highways in counties within given population ranges are given in Table 1. These percentages represent the proportion of vehicle miles driven on roadways having the given characteristics of the total vehicle miles driven statewide. The data apply to roads for which a traffic volume was available (which is the state-maintained highway system of slightly over 27,000 miles). Local county and city roadways would not be included. The data shown in Table 1 were obtained using 1990 data. There would be little change in the distribution from year to year so the same percentages have continued to be used. This would allow the same locations to be used each year to assure consistency in the data.

The decision was made to take survey data at 100 sites. The number of sites for any type of highway and county population category was equal to the percentage of vehicle miles travelled for the given type of highway and county population. For example, eight percent of all vehicle miles travelled was on rural arterial highways in counties having a population between 10,000 and 25,000 so eight sites were selected on highways meeting this criterion. A computer file was used to prepare a randomly selected list of sections of roadway for each of the categories given in Table 1. This list was used as a source for selecting sites. Data had been collected at 23 sites since 1982, and it was felt that it would be beneficial to maintain an historical record at these sites. Therefore, these sites were maintained. A list of the observation sites is presented in Table 2, and the 23 original sites are identified

with an asterisk. Many of the other sites were obtained from the randomly selected list of highway sections.

The sites had to be selected at a location where traffic would stop. A list of all locations having a traffic signal was obtained and used in the selection of sites. Except for some interstate locations, all the sites are at an intersection. Most of the intersections are controlled by a traffic signal. The sites selected to obtain data for interstates were either at an exit ramp or at a rest area. This would be the only exception to the sites being at a typical intersection. Data at an exit ramp were taken for traffic exiting the interstate at the intersection between the ramp and intersecting roadway. Another variable which was considered was the geographical location of the sites. Sites were selected to assure that they were distributed across the state. Sites were selected in 62 of the 120 counties. The largest number in any one county was eight in Jefferson County. For each category, the county, location (road and intersecting road), and city (nearest city for rural locations) are given in Table 2.

SURVEY DATA ANALYSIS

Safety belt usage rates were obtained for the driver and for all front-seat occupants. Rates were also obtained by driver age and sex and by age of the front-seat occupant. Statewide rates were obtained by weighting the usage determined for a given type of highway and county population by the percentage of vehicle miles given in Table 1 and combining the percentages from the various categories. Confidence intervals for the statewide usage rates were calculated.

For children under four years of age, rates were obtained for both front and rear seating positions as well for combined seating positions. Rates were separated into safety seat, booster seat, and harness or belt.

The 1995 usage rates for the 19 cities previously surveyed were compared to results determined in prior years. The rates for the various types of highway and county population categories were compared. Rates were also compared by region of the state.

ACCIDENT ANALYSIS

The computer files containing all reported accidents in Kentucky (for the years 1990 through 1994) were analyzed to determine the effectiveness of wearing safety belts or riding in a safety seat. The percent reductions in injuries were computed, and statistical tests were conducted to determine if the reductions were significant. This type of analysis was performed for drivers, children age three and

under, and front-and rear-seat passengers. The effectiveness of safety belts was related to several factors such as seating position, type of vehicle, and speed limit. The potential annual reduction in traffic accident fatalities and serious injuries and the accident savings from an increase in driver safety belt usage were estimated.

RESULTS

SURVEY DATA ANALYSIS

Driver usage rates for the various types of highways and county population categories are summarized in Table 3. The overall statewide rate in 1995, using the data collected at 100 sites and the weighting procedure described, was 54 percent. The sample size was 102,660 drivers. The confidence limits for a probability of 0.99 would be plus or minus 0.4 percent (13). For a given type of highway (excluding rural interstates), the usage rate was higher for counties having larger populations. In several instances, there were large fluctuations in usage rates at survey sites within the same location and population category.

While the data collection procedure changed in 1990, the usage rate may still be compared to the statewide rates from past years. The previous studies showed that statewide driver usage rates had steadily increased from 4.2 percent in 1982 to 42 percent in 1993. However, the rate of the increase had decreased. There was only a three percentage point increase in the two-year period from 1991 to 1993. The 58 percent usage in the 1994 survey shows that a dramatic increase occurred between the 1993 and 1994 data collection periods. This increase would be directly related to the enactment of a statewide safety belt law. The 1995 survey shows that driver usage has remained substantially higher than before enactment of the law, but there has been a slight decrease in usage from the rate immediately after enactment of the law. The decrease in the driver usage rate in 1995 compared to 1994 was determined to be statistically significant (probability of 0.99) (14). The four percentage point decrease from 1994 to 1995 was the first decrease found since the surveys were started in 1982. However, it is still 12 percentage points higher than the rate prior to enactment of the statewide law.

Usage rates for front-seat passengers for the various types of highways and county population categories are summarized in Tables 4 through 7 for the different age categories. Usage for children in the four to five years of age category was 48 percent plus or minus about 3 percent. This compares to 52 percent for the 1994 survey, and this decrease was not statistically significant. For children in the 6 to 12 years of age category, the usage rate was 55 percent plus or minus about 3 percent. This compares to 58 percent in 1994, and this decrease was not statistically significant. For the 13 to 19 years of age category, the usage rate was

48 percent plus or minus about 2 percent. This was a decrease from 55 percent in 1994, and this decrease was statistically significant. For the category of over 19 years of age, the usage rate was 52 percent plus or minus about one percent. This was a decrease from 57 percent in 1994 with this decrease statistically significant.

Usage rates for children one through three years of age are given in Table 8 while rates for children under one year of age are given in Table 9. These rates are for children in both the front and the rear seats. The usage rate for children under one year of age (73 percent with a confidence limit of about three percent) was higher than that for children one to three years of age (63 percent with a confidence limit of about two percent). The usage rate for the combination of these categories, or children under four years of age, was 66 percent with confidence limits for a probability of 0.99 percent of about two percent. The sample size for children under four years of age was 3,841. This age category corresponds to the children for which the mandatory child restraint law would apply. This usage rate of 66 compares to 72 percent in 1994, 61 percent in 1993, 62 percent in 1992, and 57 percent in 1990 and 1991. This percentage was about 15 percent in 1982 before enactment of the child restraint law and increased to approximately 30 percent after enactment of the law having no penalty and increased again to almost 50 percent in 1988 after the addition of a monetary penalty to the child restraint law.

The usage rate for children under four years of age was higher in the rear seat compared to the front seat. For children one to three years of age, the usage rate was 74 percent for the rear seat compared to 52 percent for the front seat. For children under one year old, the usage rate was 76 percent for the rear seat compared to 67 percent for the front seat. There was a higher percentage of children one to three years of age observed in the rear seat (53 percent) while there was a higher percentage of children under one year of age observed in the front seat (53 percent).

Safety belt usage rates for drivers and front-seat passengers, by type of highway, are presented in Table 10. The highest usage rates were on interstates (both rural and urban). This would be related in part to the longer trip lengths and higher speeds on interstates and the tendency of drivers to use safety belts more often for this type of travel. The lowest usage rates were on rural, non-interstate highways with the lowest rate on rural, local highways. There was substantial variation between highway types. For drivers, the percentage using a safety belt varied from 40 percent on rural, local highways to 69 percent on rural interstates. For front-seat passengers, the percentage for those using a safety belt varied from 38 percent on rural, local highways to 66 percent on rural interstates. For children under four years of age, the percentage using a safety seat or safety belt varied from 49 percent on rural, local highways to 77 percent on urban interstates.

There was a variation in usage by the age and sex of the driver (Table 11). Females had a substantially higher usage rate than males. The category of over 50 years of age had a slightly higher usage rate than either the 31 to 50 or 16 to 30 years of age categories.

The highest usage rate for front-seat passengers was for the under four years of age category (Table 12). This would be expected since the mandatory child restraint law has applied to this age category for several years. The four to five years of age and teenage categories had the lowest usage rates.

The change in usage of safety belts by drivers in the 19 cities in which data have been collected since 1982 is presented in Table 13. The usage rate was lower in 1995 than in 1994 in 16 of the cities. However, the 1995 usage rate had remained above the 1993 rate in all of the 19 cities. The only cities with an increase in 1995, compared to 1994, were Newport (six percent) and Frankfort (one percent). The rate in Louisville did not change. The largest decreases were in Glasgow and Princeton (nine percent). Considering all 19 cities, the usage rate ranged from 66 percent in Lexington and Louisville to 40 percent in Lawrenceburg. Using the procedure followed in the original surveys where data were taken only at sites in these 19 cities results in a statewide usage rate of 55 percent. This rate is almost identical to that determined using the revised procedure in which data are collected at 100 sites.

The change which occurred one year after the law can be seen by comparing the usage rates for drivers at the 100 data collection sites. In 1994, the rates increased at 99 of the locations compared to the 1993 data. In 1995, the rates decreased at 75 sites, increased at 22 sites and remained the same at three sites. The largest decrease was 27 percent while the largest increase was nine percent. Usage rates for drivers ranged from 24 percent in Owingsville to 84 percent on Interstate 24 in Trigg County. There were 12 sites which had a usage rate over 70 percent of which nine were interstate locations with the remaining three in Louisville. There were 15 sites with a usage rate under 30 percent. All of these low rates occurred in small towns. Six of the seven rural, local locations had a rate under 30 percent.

The change in usage of safety seats or belts by children under four years of age in these 19 cities is presented in Table 14. The usage rate was higher in 1995 than in 1994 in seven of the 19 cities while it decreased in 11 cities and remained the same in one. The small sample sizes could result in substantial variations in usage rates. The usage rates ranged from over 89 percent in Louisville to 56 percent in Carrollton. Using the procedure followed in the original surveys in which data were taken only at sites in these 19 cities results in a statewide usage

rate of 73 percent which is higher than the 66 percent using the revised procedure in which data are collected at 100 sites.

A summary of the data collected is given in the Appendix. For each of the 100 data sites, the usage rate and sample size are given for drivers, front-seat passengers (by age category for over four years of age), and children in the one to three years of age and under one year old age categories (both front and rear seat).

Obvious improper usage of safety seats had been estimated in previous surveys. However, improper usage could only be determined when there was a very obvious problem. Since the improper usage percentages were very low compared to studies dealing specifically with this subject, improper usage data were not summarized for this survey.

Helmet use by motorcyclists was noted during the survey. Kentucky has a statewide law requiring the use of a helmet by a motorcyclist. The results confirm the expected high usage. Only four of the 343 observed motorcyclists were not wearing a helmet giving a usage rate of 99 percent.

Usage for minority drivers was obtained with a sample size of approximately 4,423 drivers. The same procedure used for all drivers was utilized to obtain a statewide usage rate. The statewide usage rate for minority drivers was determined to be 52 percent compared to 54 percent for all drivers. This shows there was no substantial difference in usage rates for minority drivers.

ACCIDENT ANALYSIS

The number and percentage of all drivers involved in police-reported accidents sustaining a given injury as a function of whether a safety belt was used are summarized in Table 15 (based on 1990 through 1994 accident data). By comparing the percentages, the percent reduction associated with safety belt usage could be calculated. The largest reduction was for a fatal injury (85 percent reduction) with the reduction decreasing for less severe injuries. For comparison, the reduction was 18 percent for the "possible injury" category. The reductions in the percentage for each of the types of injuries were determined to be statistically significant (probability of 0.99). In severe accidents, use of a safety belt would lessen, but not eliminate, the injury. This resulted in the smaller reductions in the less severe injury classifications. There was a 56 percent reduction in a driver sustaining a fatal or severe injury in a traffic accident when a safety belt was worn compared to not wearing a safety belt. This agrees with other research studies which report that lap and shoulder safety belts, when used, reduce the risk of fatal or serious occupant injuries by between 40 and 55 percent (15).

The effectiveness of safety belts in reducing driver injuries was related to several variables. In Table 16, the percentage of drivers sustaining either a fatal or severe injury who were wearing or not wearing a safety belt was related to type of vehicle, type of accident, and speed limit. There were reductions in the percentage of fatal or severe injuries for drivers of passenger cars, single-unit trucks, and combination trucks. The reduction was slightly higher for drivers of trucks. The severity of injuries to drivers of passenger cars was higher than for drivers of trucks. Safety belts also reduced the percentage for fatally or severely injured in various types of accidents. The types of accidents were chosen to represent the extremes of accidents in terms of severity. Reductions were noted for the relatively low severity rear-end accidents as well as the more severe fixed object, head-on, and "overturned" accidents. Safety belts also were determined to be effective in reducing fatal or severe injuries for accidents occurring on either 35-mph local streets or 55-mph high speed roadways.

The number and percentage of children age three and under sustaining a given injury as a function of whether a safety seat or safety belt was used are summarized in Table 17. There were substantial reductions, higher for the most severe injury types, associated with using either a safety seat or safety belt. The reductions were fairly similar for use of either the safety seat or safety belt. The reductions for all injury categories, except fatalities, were statistically significant (probability of 0.99). Of 44 fatalities, 18 involved children not using a safety seat or safety belt. The percent reductions were generally higher than that for drivers (as given in Table 15). There was a 73 percent reduction in the chance of a child less than age four, involved in a traffic accident, sustaining a fatal or severe injury when a safety seat was used compared to not using any restraining device. Also, as shown in Table 18, the reductions in injuries applied to both the rear-and front-seating positions. The data in Table 18 show that accident severity was less in the rear than in the front seat.

The number and percentage of occupants other than drivers sustaining a given injury as a function of whether a safety belt was used are listed in Table 19. As with drivers, there was a large reduction in the percent injured (all reductions were statistically significant with a probability of 0.99). Overall, these percent reductions were very similar to those for drivers. The chance of a vehicle occupant, other than the driver, sustaining a fatal or severe injury in a traffic accident was reduced by 59 percent if a safety belt was worn compared to not wearing a safety belt.

The accident severities associated with using a lap belt and/or shoulder harness for occupants other than the driver (by seating position in the front or rear seat) are listed in Table 20. Only a lap belt was available in the rear seat in the majority of vehicles involved in accidents in the time period studied. The use of a

shoulder harness and/or lap belt in the front seat or a lap belt in the rear reduced injuries dramatically (all reductions were statistically significant with a probability of 0.99). Accident severity was less in the rear seat and the percent reduction in injuries was generally greater in the rear seat than the front seat. The use of primarily a lap belt in the rear seat has been effective with a reduction in fatal or incapacitating injuries of 67 percent. This finding should not be interpreted to suggest that it would not be preferable to have a combination lap belt/shoulder harness in the rear seat.

The potential annual reductions in traffic accident fatalities and accident savings from an increase in driver safety belt usage are presented in Table 21. The reduction in fatalities and associated accident cost savings were calculated using the reduction factors listed in Table 15, accident data for the years of 1990 through 1994, the 58 percent usage rate determined from the 1994 observational survey, the average usage rate over the 1990 through 1994 time period, and accident cost estimates recommended by the Federal Highway Administration (16).

SUMMARY

Observations were taken at 100 sites across Kentucky to obtain safety belt usage rates. A sample of slightly over 100,000 drivers was obtained.

A statewide safety belt law was passed in Kentucky in 1994. The law applies to all vehicle occupants. Prior to the statewide law, there were local ordinances passed in several cities and counties which covered approximately one-third of the statewide population. The data collected in 1994, after the effective date of the statewide law, showed that enactment of the statewide law had a dramatic effect on usage rates. The usage rate for drivers increased from 42 percent in 1993 to 58 percent in 1994. The survey data collected in 1995 show that the rate decreased slightly to 54 percent. A summary of usage rates from 1982 through 1995 is given in Table 22. With the exception of rural interstates, the rate was generally higher in urban compared to rural areas. The lowest rates were on local roadways in rural counties.

The statewide usage rates for front-seat passengers were also obtained. Considering all passengers, the usage rate was 52 percent. Usage varied with age with the highest usage for the under four years of age category and the lowest usage for the 4 to 5 years of age and teenage categories.

Kentucky had a statewide law requiring children under 40 inches in height to be placed in a child restraint prior to the law applying to all occupants. The statewide usage rate for children under the age of four (including both the front and

rear seat) was determined to be 66 percent. This represents a decrease from the 72 percent usage determined in the 1994 survey.

A usage rate was determined for minority drivers. The data show there was no difference in usage for minority drivers, compared to all drivers. The very high compliance of motorcyclists with the requirement to wear a helmet was confirmed (99 percent helmet usage).

The significant benefits, based upon the reduction of injuries, for occupants involved in a police-reported accident wearing a safety belt or in a safety seat were shown through the analysis of accident records. For example, one finding was that there was a 59-percent reduction in fatal or incapacitating injuries for drivers wearing a safety belt compared to those who were not. The benefit, in terms of the reduction in injuries, from wearing a safety belt in either the front or rear seat was documented. The potential savings in fatalities, serious injuries, and accident costs which could be obtained from an increase in the use of safety belts was shown. For example, an increase in the driver usage rate up to 70 percent usage would result in a potential annual reduction of 176 fatalities and an annual accident savings from the reduction in fatalities and serious injuries of about 308 million dollars.

RECOMMENDATIONS

The data show that the large increase in the safety belt usage rate which occurred after enactment of the statewide safety belt law in 1994 has not continued. While the usage rate in 1995 is still substantially above the level prior to the statewide law, efforts must be made to increase usage. The efforts should include both education and enforcement. Public information and education concerning the law and the reasons to wear safety belts should continue. Also, enforcement of the law along with public information about this enforcement and resulting citations should be increased. The survey data can be used to identify areas in need of additional enforcement and education.

To aid in enforcement of the law, consideration should be given to modifying the current law to allow primary, rather than secondary, enforcement.

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Figure 1. Data Collection Form.

SAFETY BELT DATA COLLECTION FORM

Date:_____ Starting Time:_____ Ending Time:_____ Int #_____

Location:_____ Sheet No.:_____

Observer:_____ Comment:_____

DRIVER USAGE

Age & Sex	Harness or Belt	None
16-30 M		
31-50 M		
> 50 M		
16-30 F		
31-50 F		
>50 F		
MINORITY		

FRONT-SEAT OCCUPANT USAGE (OVER 3 YEARS OF AGE)

Age	Harness or belt	None
4-5		
6-12		
13-19		
Over 19		

USAGE FOR CHILDREN 1-3 YEARS OF AGE

	Safety seat	Safety seat (Improper)	Booster seat	Harness or Belt	None
Front					
Rear					

USAGE FOR INFANTS (UNDER 1 YEAR OF AGE)

	Safety Seat	Safety seat(Improper)	None
Front			
Rear			

Helmet Y-
N-

TABLE 1. DISTRIBUTION OF VEHICLE MILES TRAVELED BY TYPE OF HIGHWAY AND COUNTY POPULATION

TYPE OF HIGHWAY	COUNTY POPULATION	PERCENTAGE OF ALL VEHICLE MILES
Rural Interstate	Over 100,000	1.04
	50,001-100,000	2.78
	25,001-50,000	4.96
	10,000-25,000	5.19
	Under 10,000	1.32
Rural Arterial	Over 50,000	3.14
	25,001-50,000	7.36
	10,000-25,000	8.12
	Under 10,000	1.93
Rural Collector	Over 100,000	0.65
	50,001-100,000	3.19
	25,001-50,000	7.70
	10,000-25,000	9.72
	Under 10,000	2.28
Rural Local	Over 50,000	0.74
	25,000-50,000	1.74
	Under 25,000	3.74
Urban Interstate	Over 100,000	8.32
	50,000-100,000	1.49
	Under 50,000	1.06
Urban Arterial	Over 100,000	10.23
	25,000-100,000	9.52
	Under 25,000	1.79
Urban Collector or Local	All	1.99

TABLE 2. STATEWIDE SURVEY LOCATIONS

TYPE LOCATION	COUNTY POPULATION	SURVEY SITE
Rural Interstate	Over 100,000	Fayette, I 64 at KY 859, Lexington
	50,001-100,000	Boyd, I 64 at US 23, Catlettsburg
		Christian, I 24 at US 41A, Hopkinsville
		Hardin, I 65 at rest area, Sonora
	25,001-50,000	Barren, I 64 at KY 70, Cave City
		Boone, I 75 at rest area, Florence
		Clark, I 64 at KY 627, Winchester
		Franklin, I 64 at US 60, Frankfort
		Laurel, I 75 at KY 80, London
	10,000-25,000	Henry, I 71 at KY 153, Sligo
		Rockcastle, I 75 at US 25, Mt. Vernon
		Scott, I 75 at rest area, Georgetown
		Shelby, I 64 at KY 53, Shelbyville
		Woodford, I 64 at KY 341, Midway
	Under 10,000	Trigg, I 24 at US 68, Cadiz
Rural Arterial	Over 50,000	Pike, US 460 at KY 122, Shelbiana
		Daviess, US 60 at KY 144, Owensboro
		Hardin, US 31W at KY 835, West Point
	25,001-50,000	Perry, KY 15X at KY 476, Hazard*
		Knox, US 25E at KY 225, Barbourville
		Harlan, US 119 at KY 179, Cumberland
		Floyd, KY 80 at US 23, Allen
		Bullitt, US 31E at KY 44, Mt. Washington
		Carter, KY 1 at I 64, Grayson
		Laurel, US 25 at KY 80, London
	10,000-25,000	Mason, US 62 at KY 11, Maysville*
		Clay, US 421 at KY 80, Manchester
		Bourbon, US 68 at 5th St., Millersburg
		Casey, US 127 at KY 70, Liberty
		Meade, US 31W at KY 1638, Muldraugh
		Lincoln, US 127 at KY 78, Hustonville
		Russell, US 127 at KY 80, Russell Springs
		Washington, US 150 at KY 55, Springfield
	Under 10,000	Cumberland, KY 90 at KY 61, Burkesville
		Ballard, US 60 at KY 358, LaCenter

TABLE 2. STATEWIDE SURVEY LOCATIONS (continued)

TYPE LOCATION	COUNTY POPULATION	SURVEY SITE
Rural Collector	Over 100,000	Fayette, KY 418 at I 75, Lexington
	50,001-100,000	Christian, US 41 at KY 1682, Hopkinsville McCracken, US 62 at US 68, Reidland Madison, KY 52 at KY 876, Richmond
	25,001-50,000	Barren, KY 255 at US 31W, Park City Nelson, US 62 at KY 48, Bloomfield Boone, KY 18 at KY 237, Burlington Oldham, KY 146 at KY 393, Buckner Knox, KY 11 at US 25E, Barbourville Henderson, KY 145 at US 60, Corydon Boyle, US 68 at US 150, Perryville Greenup, KY 1 at US 23, Greenup
	10,000-25,000	Caldwell, KY 139 at Jefferson, Princeton* Grayson, US 62 at KY 259, Leitchfield Allen, US 231 at US 31E, Scottsville Bath, US 60 at KY 36, Owingsville Larue, KY 84 at KY 61, Hodgenville Scott, US 62 at I 75, Georgetown Anderson, US 127 at US 127B, Lawrenceburg Breathitt, KY 30 at KY 15, Jackson Webster, US 41 at KY 56, Sebree Garrard, KY 39 at US 27, Lancaster
	Under 10,000	Carroll, US 42 at 6th Street, Carrollton* Elliott, KY 32 at KY 7, Sandy Hook
Rural Local	Over 50,000	McCracken, KY 1286 at US 62, Paducah
	25,000-50,000	Harlan, KY 840 at US 119, Loyall Greenup, KY 7 at US 23, South Shore
	Under 25,000	Lewis, KY 10 at KY 57, Tollesboro Simpson, KY 73 at KY 100, Franklin Adair, KY 2290 at KY 55, Columbia Taylor, KY 208 at US 68, Campbellsville
Urban Interstate	Over 100,000	Kenton, I 275 at KY 17, Covington Kenton, I 75 at KY 371, Cresent Springs Fayette, I 75 at US 68, Lexington Jefferson, I 64 at KY 1747, Louisville

TABLE 2. STATEWIDE SURVEY LOCATIONS (continued)

TYPE LOCATION	COUNTY POPULATION	SURVEY SITE
Urban Interstate	Over 100,000	Jefferson, I 64 at KY 1631, Louisville
		Jefferson, I 264 at US 31E, Louisville
		Jefferson, I 264 at US 42, Louisville
		Jefferson, I 264 at US 60, Louisville
	50,000-100,000	Warren, I 65 at US 231, Bowling Green
	Under 50,000	Boone, I 71 at KY 14, Verona
Urban Arterial	Over 100,000	Jefferson, US 31W at Gagel, Louisville*
		Jefferson, KY 1447 at Hubbards, Louisville*
		Jefferson, KY 1703 at Trevillian Way, Louisville*
		Fayette, US 27 at KY 1683, Lexington*
		Fayette, Reynolds at Lansdowne, Lexington*
		Fayette, KY 4 at KY 353, Lexington*
		Kenton, US 25 at KY 236, Covington
		Kenton, KY 8 at KY 17, Covington
		Kenton, KY 16 at KY 177, Covington
		Fayette, US 25 at Fontaine, Lexington
	25,000-100,000	Campbell, US 27 at Carothers, Newport*
		Christian, US 41 at Ninth, Hopkinsville*
		Hopkins, US 41A at KY 70, Madisonville*
		Pulaski, US 27 at KY 80, Somerset*
		Franklin, US 60 at Sunset, Frankfort*
		Henderson, US 41A at First, Henderson*
		Nelson, US 31E at Beall, Bardstown
		Barren, US 68 at Race, Glasgow*
		Clark, US 60 at KY 1958, Winchester*
		Warren, US 31W at US 231, Bowling Green
	Under 25,000	Anderson, US 62 at US 127, Lawrenceburg*
		Rowan, US 60 at KY 32, Morehead*
Urban Collector or Local	All	Hardin, Poplar at Sycamore, Elizabethtown*
		Kenton, KY 1072 at Highland, Covington*

* Original data collection site.

TABLE 3. DRIVER USAGE RATES

TYPE OF HIGHWAY	COUNTY POPULATION	USAGE RATE (PERCENT)	SAMPLE SIZE
Rural Interstate	Over 100,000	76	269
	50,001-100,000	74	1,526
	25,001-50,000	67	3,089
	10,000-25,000	62	1,679
	Under 10,000	84	395
Rural Arterial	Over 50,000	56	4,053
	25,001-50,000	48	8,347
	10,000-25,000	48	8,378
	Under 10,000	39	1,819
Rural Collector	Over 100,000	57	1,042
	50,001-100,000	55	3,241
	25,001-50,000	47	6,141
	10,000-25,000	45	7,202
	Under 10,000	43	1,535
Rural Local	Over 50,000	61	726
	25,000-50,000	35	864
	Under 25,000	36	2,565
Urban Interstate	Over 100,000	66	11,399
	50,000-100,000	66	1,323
	Under 50,000	56	225
Urban Arterial	Over 100,000	61	15,381
	25,000-100,000	55	16,655
	Under 25,000	46	1,905
Urban Collector or Local	All	57	2,901
ALL	All	54	102,660

TABLE 4. FRONT-SEAT PASSENGER (AGE 4-5 YEARS) USAGE RATES

TYPE OF HIGHWAY	COUNTY POPULATION	USAGE RATE (PERCENT)	SAMPLE SIZE
Rural Interstate	Over 100,000	67	3
	50,001-100,000	71	14
	25,001-50,000	42	36
	10,000-25,000	55	20
	Under 10,000	100	2
Rural Arterial	Over 50,000	60	40
	25,001-50,000	37	139
	10,000-25,000	37	132
	Under 10,000	33	27
Rural Collector	Over 100,000	27	11
	50,001-100,000	67	45
	25,001-50,000	38	94
	10,000-25,000	40	115
	Under 10,000	33	42
Rural Local	Over 50,000	67	9
	25,000-50,000	38	16
	Under 25,000	30	53
Urban Interstate	Over 100,000	62	117
	50,000-100,000	44	48
	Under 50,000	67	3
Urban Arterial	Over 100,000	57	202
	25,000-100,000	51	244
	Under 25,000	34	35
Urban Collector or Local	All	63	43
ALL	All	48	1,490

TABLE 5. FRONT-SEAT PASSENGER (AGE 6-12 YEARS) USAGE RATES

TYPE OF HIGHWAY	COUNTY POPULATION	USAGE RATE (PERCENT)	SAMPLE SIZE
Rural Interstate	Over 100,000	80	5
	50,001-100,000	66	32
	25,001-50,000	58	60
	10,000-25,000	55	47
	Under 10,000	83	6
Rural Arterial	Over 50,000	52	106
	25,001-50,000	45	184
	10,000-25,000	41	212
	Under 10,000	41	29
Rural Collector	Over 100,000	42	12
	50,001-100,000	54	79
	25,001-50,000	53	152
	10,000-25,000	45	126
	Under 10,000	55	22
Rural Local	Over 50,000	79	14
	25,000-50,000	55	20
	Under 25,000	33	98
Urban Interstate	Over 100,000	71	158
	50,000-100,000	47	75
	Under 50,000	80	5
Urban Arterial	Over 100,000	66	232
	25,000-100,000	55	307
	Under 25,000	54	13
Urban Collector or Local	All	57	97
ALL	All	55	2,091

TABLE 6. FRONT-SEAT PASSENGER (AGE 13-19 YEARS) USAGE RATES

TYPE OF HIGHWAY	COUNTY POPULATION	USAGE RATE (PERCENT)	SAMPLE SIZE
Rural Interstate	Over 100,000	62	8
	50,001-100,000	56	77
	25,001-50,000	62	111
	10,000-25,000	62	91
	Under 10,000	61	23
Rural Arterial	Over 50,000	47	192
	25,001-50,000	39	387
	10,000-25,000	41	503
	Under 10,000	62	105
Rural Collector	Over 100,000	41	29
	50,001-100,000	55	181
	25,001-50,000	43	352
	10,000-25,000	34	343
	Under 10,000	50	44
Rural Local	Over 50,000	66	35
	25,000-50,000	29	68
	Under 25,000	26	202
Urban Interstate	Over 100,000	62	410
	50,000-100,000	55	131
	Under 50,000	60	10
Urban Arterial	Over 100,000	53	562
	25,000-100,000	46	819
	Under 25,000	36	44
Urban Collector or Local	All	49	213
ALL	All	48	4,920

TABLE 7. FRONT-SEAT PASSENGER (OVER 19 YEARS OF AGE) USAGE RATES

TYPE OF HIGHWAY	COUNTY POPULATION	USAGE RATE (PERCENT)	SAMPLE SIZE
Rural Interstate	Over 100,000	70	54
	50,001-100,000	70	488
	25,001-50,000	64	1,045
	10,000-25,000	70	552
	Under 10,000	83	140
Rural Arterial	Over 50,000	57	940
	25,001-50,000	43	2,169
	10,000-25,000	48	2,007
	Under 10,000	47	387
Rural Collector	Over 100,000	58	256
	50,001-100,000	52	607
	25,001-50,000	45	1,353
	10,000-25,000	44	1,557
	Under 10,000	43	301
Rural Local	Over 50,000	63	115
	25,000-50,000	31	191
	Under 25,000	37	520
Urban Interstate	Over 100,000	57	1,748
	50,000-100,000	50	360
	Under 50,000	49	51
Urban Arterial	Over 100,000	57	2,691
	25,000-100,000	50	2,788
	Under 25,000	46	410
Urban Collector or Local	All	49	398
ALL	All	52	21,128

TABLE 8. USAGE RATES FOR CHILDREN 1-3 YEARS OF AGE (FRONT AND REAR)

TYPE OF HIGHWAY	COUNTY POPULATION	USAGE RATE (PERCENT)	SAMPLE SIZE
Rural Interstate	Over 100,000	75	4
	50,001-100,000	80	41
	25,001-50,000	55	64
	10,000-25,000	66	58
	Under 10,000	83	6
Rural Arterial	Over 50,000	64	104
	25,001-50,000	61	243
	10,000-25,000	52	226
	Under 10,000	46	56
Rural Collector	Over 100,000	94	16
	50,001-100,000	72	98
	25,001-50,000	59	164
	10,000-25,000	57	230
	Under 10,000	32	37
Rural Local	Over 50,000	93	14
	25,000-50,000	61	28
	Under 25,000	37	97
Urban Interstate	Over 100,000	80	213
	50,000-100,000	62	65
	Under 50,000	70	10
Urban Arterial	Over 100,000	71	400
	25,000-100,000	68	526
	Under 25,000	62	95
Urban Collector or Local	All	67	97
ALL	All	63	2,892

TABLE 9. USAGE RATES FOR CHILDREN UNDER 1 YEAR OF AGE (FRONT AND REAR)

TYPE OF HIGHWAY	COUNTY POPULATION	USAGE RATE (PERCENT)	SAMPLE SIZE
Rural Interstate	Over 100,000	100	2
	50,001-100,000	94	18
	25,001-50,000	83	12
	10,000-25,000	88	16
	Under 10,000	100	1
Rural Arterial	Over 50,000	69	36
	25,001-50,000	69	65
	10,000-25,000	71	75
	Under 10,000	58	26
Rural Collector	Over 100,000	100	6
	50,001-100,000	80	44
	25,001-50,000	74	68
	10,000-25,000	80	49
	Under 10,000	64	11
Rural Local	Over 50,000	75	8
	25,000-50,000	80	5
	Under 25,000	46	48
Urban Interstate	Over 100,000	96	67
	50,000-100,000	60	52
	Under 50,000	100	4
Urban Arterial	Over 100,000	88	95
	25,000-100,000	70	196
	Under 25,000	94	16
Urban Collector or Local	All	79	29
ALL	All	73	949

TABLE 10. USAGE RATES FOR DRIVERS AND PASSENGERS BY TYPE OF HIGHWAY

TYPE OF HIGHWAY	PERCENT USAGE		
	DRIVERS	FRONT-SEAT PASSENGERS	CHILDREN UNDER FOUR YEARS OF AGE
Rural Interstate	69	66	71
Rural Arterial	49	46	60
Rural Collector	48	46	64
Rural Local	40	38	49
Urban Interstate	66	62	77
Urban Arterial	57	53	71
Urban Collector or Local	56	51	70
ALL	54	52	66

TABLE 11. STATEWIDE USAGE RATE BY AGE AND SEX OF DRIVER

CATEGORY	USAGE RATE (PERCENT)
Male	48
Female	64
16-30 Years of Age	52
31-50 Years of Age	55
Over 50 Years of Age	57

TABLE 12. STATEWIDE USAGE RATE FOR FRONT SEAT PASSENGERS BY AGE CATEGORY

CATEGORY	USAGE RATE (PERCENT)
Under 4	58
4 - 5	48
6 - 12	55
13 - 19	48
Over 19	52

TABLE 13. CHANGE IN USAGE OF SAFETY BELTS BY DRIVERS IN ORIGINAL STATEWIDE SURVEY CITIES

	PERCENT USING SAFETY BELTS												
CITY	1982	1983	1984	1985	1986	1988	1989	1990	1991	1992	1993	1994	1995
Louisville	6	12	13	14	16	25	28	38	70	66	60	66	66
Lexington	8	10	10	17	24	31	42	80	69	61	65	70	66
Covington	8	9	12	16	22	28	32	39	37	51	58	59	58
Hopkinsville	3	3	4	6	10	20	21	24	27	30	27	63	58
Frankfort	5	7	7	11	14	19	24	38	38	46	44	63	64
Henderson	3	5	7	9	11	20	22	29	29	29	32	62	54
Newport	5	6	5	6	9	20	26	35	34	34	29	39	45
Madisonville	2	3	5	8	12	20	22	26	26	27	28	70	63
Elizabethtown	3	4	5	8	14	20	26	31	34	39	34	60	55
Winchester	2	3	6	9	12	25	33	37	35	38	32	59	55
Glasgow	3	3	3	5	6	12	15	19	27	29	26	53	44
Somerset	2	4	6	7	9	19	26	21	29	28	28	59	54
Maysville	2	3	6	6	13	19	25	29	34	33	34	54	47
Morehead	3	3	3	5	7	12	15	22	23	26	28	59	53
Princeton	2	2	2	3	6	12	15	17	19	20	21	54	45
Bardstown	4	4	6	7	13	19	21	23	30	40	45	58	50
Hazard	4	3	4	6	5	10	12	15	19	19	29	52	49
Lawrenceburg	1	2	3	6	5	9	15	19	22	24	23	43	40
Carrollton	3	5	5	7	10	16	19	35	34	30	31	51	47

TABLE 14. CHANGE IN USAGE OF SAFETY SEATS OR BELTS BY CHILDREN UNDER FOUR YEARS OF AGE IN ORIGINAL STATEWIDE SURVEY CITIES

	PERCENT USING SAFETY SEATS OR BELTS												
CITY	1982	1983	1984	1985	1986	1988	1989	1990	1991	1992	1993	1994	1995
Louisville	22	36	49	42	40	68	65	80	86	87	83	88	89
Lexington	32	46	50	44	46	78	78	91	90	87	81	83	77
Covington	22	39	49	47	50	59	53	66	67	72	84	74	86
Hopkinsville	12	19	19	20	21	33	38	40	51	54	56	76	78
Frankfort	15	26	30	27	30	43	43	57	72	72	62	97	75
Henderson	14	18	26	30	31	36	42	53	53	58	58	78	76
Newport	11	27	20	22	22	60	60	57	75	57	46	63	80
Madisonville	12	18	29	35	38	52	51	54	60	57	59	86	85
Elizabethtown	11	27	34	30	32	41	42	51	46	63	71	69	57
Winchester	12	14	33	29	26	56	68	51	53	58	64	74	72
Glasgow	14	17	20	18	21	36	38	39	47	50	36	67	61
Somerset	7	23	24	22	26	48	47	48	62	54	61	60	61
Maysville	12	18	17	19	25	31	34	36	55	58	62	70	58
Morehead	10	14	13	15	14	25	27	35	51	61	62	72	85
Princeton	10	12	12	16	20	33	41	52	52	53	60	71	71
Bardstown	20	21	31	31	31	41	39	42	76	67	75	84	76
Hazard	7	10	9	11	13	19	20	25	34	50	40	65	61
Lawrenceburg	7	6	22	23	20	32	29	35	77	65	41	52	59
Carrollton	6	10	16	22	19	26	28	31	45	62	43	62	56

TABLE 15. ACCIDENT SEVERITY VERSUS SAFETY BELT USAGE (ALL DRIVERS)*

TYPE OF INJURY	NOT WEARING SAFETY BELT		WEARING SAFETY BELT		PERCENT REDUCTION
	NUMBER	PERCENT	NUMBER	PERCENT	
Fatal	1,942	0.46	434	0.07	85**
Incapacitating	16,831	3.98	11,419	1.76	56**
Non-Incapacitating	29,044	6.82	25,777	3.97	42**
Possible Injury	32,584	7.70	41,042	6.32	18**
Fatal or Incapacitating	18,773	4.44	11,853	1.83	59**

* Based on 1990 through 1994 accident data. Total sample size for not wearing a safety belt was 422,983 compared to 635,372 for wearing a safety belt.

** Statistically significant reduction (probability of 0.99).

TABLE 16. ACCIDENT SEVERITY VERSUS SAFETY BELT USAGE BY TYPE OF VEHICLE, SPEED LIMIT, AND TYPE OF ACCIDENT (ALL DRIVERS)*

VARIABLE	CATEGORY	PERCENT SUSTAINING FATAL OR SEVERE INJURY		PERCENT REDUCTION
		NOT WEARING SAFETY BELT	WEARING SAFETY BELT	
Type of Vehicle	Passenger Car	4.53	1.88	58
	Single-Unit Truck	2.75	0.96	65
	Combination Truck	2.81	1.08	63
Type of Accident (Non-Intersection)	Rear End	1.95	1.15	41
	Fixed Object	14.88	5.62	62
	Head-On	21.38	13.45	37
	Overturned	19.70	7.39	62
Speed Limit (mph)	35	3.07	1.31	57
	45	4.52	1.89	58
	55	9.25	3.91	58

* Based on 1990 through 1994 accident data.

TABLE 17. ACCIDENT SEVERITY VERSUS SAFETY SEAT AND BELT USAGE (CHILDREN AGE THREE AND UNDER)*

TYPE OF INJURY	NOT USING SAFETY SEAT OR BELT NUMBER	NOT USING SAFETY SEAT OR BELT PERCENT	USING SAFETY SEAT NUMBER	USING SAFETY SEAT PERCENT	USING SAFETY BELT NUMBER	USING SAFETY BELT PERCENT	PERCENT REDUCTION SAFETY SEAT	PERCENT REDUCTION SAFETY BELT
Fatal	18	0.12	22	0.09	4	0.02	25	82
Incapacitating	414	2.76	168	0.69	184	1.01	75**	63**
Non-Incapacitating	936	6.25	665	2.72	470	2.58	56**	59**
Possible Injury	1,358	9.06	1,163	4.75	1,099	6.03	48**	33**
Fatal or Incapacitating	432	2.88	190	0.78	188	1.03	73**	64**

* Based on 1990 through 1994 accident data. Total sample sizes were 14,987 for not using a safety seat or belt, 24,502 for using a safety seat, and 18,308 for using a safety belt.

** Statistically significant reduction (probability of 0.99).

TABLE 18. ACCIDENT SEVERITY VERSUS SAFETY SEAT AND BELT USAGE BY SEATING POSITION (CHILDREN AGE THREE AND UNDER)*

SEATING POSITION	TYPE OF INJURY	NOT USING SAFETY SEAT OR BELT NUMBER	NOT USING SAFETY SEAT OR BELT PERCENT	USING SAFETY SEAT OR BELT NUMBER	USING SAFETY SEAT OR BELT PERCENT	PERCENT REDUCTION
Front	Fatal	13	0.13	10	0.05	58
	Incapacitating	296	2.89	192	1.01	65**
	Non-Incapacitating	694	6.77	626	3.30	51**
	Possible Injury	1,007	9.82	1,223	6.45	34**
	Fatal or Incapacitating	309	3.01	202	1.06	65**
Rear	Fatal	5	0.11	16	0.07	36
	Incapacitating	118	2.49	160	0.67	73**
	Non-Incapacitating	242	5.12	510	2.15	58**
	Possible Injury	351	7.42	1,039	4.38	41**
	Fatal or Incapacitating	123	2.60	176	0.74	71**

* Based on 1990 through 1994 accident data. Total sample sizes were 10,253 and 4,730 for not using a safety seat or belt in the front and rear seats, respectively, and 18,968 and 23,742 for using either a safety seat or belt in the front and rear seats, respectively.

** Statistically significant reduction (probability of 0.99).

TABLE 19. ACCIDENT SEVERITY VERSUS SAFETY BELT OR SEAT USAGE (OCCUPANTS OTHER THAN DRIVERS)*

TYPE OF INJURY	NOT USING LAP BELT OR SHOULDER HARNESS NUMBER	NOT USING LAP BELT OR SHOULDER HARNESS PERCENT	USING LAP BELT AND/OR SHOULDER HARNESS NUMBER	USING LAP BELT AND/OR SHOULDER HARNESS PERCENT	PERCENT REDUCTION
Fatal	879	0.38	192	0.08	80**
Incapacitating	10,457	4.50	4,892	1.93	57**
Non-Incapacitating	20,646	8.89	12,004	4.72	47**
Possible Injury	22,271	9.59	19,347	7.61	21**
Fatal or Incapacitating	11,336	4.88	5,084	2.00	59**

* Based on 1990 through 1994 accident data. Total sample sizes were 232,191 not using a safety belt or seat compared to 254,074 using a safety belt.

** Statistically significant reduction (probability of 0.99).

TABLE 20. ACCIDENT SEVERITY VERSUS SAFETY BELT USAGE (OCCUPANTS OTHER THAN DRIVERS)*

SEATING POSITION	TYPE OF INJURY	NOT USING LAP BELT OR SHOULDER HARNESS NUMBER	NOT USING LAP BELT OR SHOULDER HARNESS PERCENT	USING LAP BELT AND/OR SHOULDER HARNESS NUMBER	USING LAP BELT AND/OR SHOULDER HARNESS PERCENT	PERCENT REDUCTION
Front	Fatal	683	0.41	152	0.09	79***
	Incapacitating	7,890	4.76	3,869	2.19	54***
	Non-Incapacitating	15,277	9.22	8,975	5.09	45***
	Possible Injury	16,686	10.07	14,799	8.39	17***
	Fatal or Incapacitating	8,573	5.17	4,021	2.28	56***
Rear**	Fatal	196	0.29	40	0.05	83***
	Incapacitating	2,567	3.86	1,023	1.32	66***
	Non-Incapacitating	5,369	8.08	3,029	3.90	52***
	Possible Injury	5,585	8.40	4,548	5.85	30***
	Fatal or Incapacitating	2,763	4.16	1,063	1.37	67***

* Based on 1990 through 1994 accident data. Total sample sizes were 165,741 and 66,450 for not using a safety belt in the front seat and rear seat, respectively, and 176,375 and 77,699 for using a safety belt in the front and rear seat, respectively.

** Lap belts only primarily used in rear seats.

*** Statistically significant reduction (probability of 0.99).

TABLE 21. POTENTIAL ANNUAL REDUCTION IN TRAFFIC ACCIDENT FATALITIES AND ACCIDENT SAVINGS FROM INCREASE IN DRIVER SAFETY BELT USAGE*

DRIVER USAGE RATE (PERCENT)	POTENTIAL ANNUAL REDUCTION IN NUMBER OF FATALITIES	POTENTIAL ANNUAL REDUCTION IN NUMBER OF SERIOUS INJURIES**	ANNUAL ACCIDENT SAVINGS SAVINGS MILLION $ FROM REDUCTION IN FATALITIES	ANNUAL ACCIDENT SAVINGS SAVINGS MILLION $ FROM REDUCTION IN SERIOUS INJURIES	TOTAL
60	113	727	169.5	28.4	197.9
70	176	1,131	264.0	44.1	308.1
80	239	1,536	358.5	59.9	418.4
90	302	1,940	453.0	75.7	528.7
100	364	2,344	546.0	91.4	637.4

* Based on increase from the 58 usage rate determined in the 1994 survey, the percent reductions listed in Table 15, and accident cost estimates recommended by the Federal Highway Administration (15). These costs are $1,500,000 for a fatality and $39,000 for an incapacitating injury. The actual number of fatalities and incapacitating injuries for 1990 through 1994 were used along with the average usage rate over this time period.

** Serious injuries were defined as those listed as incapacitating on the accident report.

TABLE 22. STATEWIDE USAGE RATES

YEAR	PERCENT USING SAFETY BELTS DRIVERS	PERCENT USING SAFETY BELTS CHILDREN UNDER FOUR YEARS OF AGE*
1982	4	15
1983	6	24
1984	7	30
1985	9	29
1986	13	30
1988	21	48
1989	26	49
1990	32	57
1991	39	57
1992	41	62
1993	42	61
1994	58	72
1995	54	66

* Children using either safety seat or safety belt.
Children seated in either front or rear seat.

APPENDIX

SUMMARY OF DATA

LIST OF SURVEY LOCATIONS

1 Fayette, I64 at KY 859
2 Boyd, I64 at US 23
3 Christian,I24 at US 41A,Hopkinsville
4 Hardin, I65 at rest area, Sonora
5 Barren, I65 at KY 70, Cave City
6 Boone, I75 at rest area, Florence
7 Clark, I64 at KY 627, Winchester
8 Franklin, I64 at US 60, Frankfort
9 Laurel, I75 at KY 80, London
10 Henry, I71 at KY 153, Sligo
11 Rockcastle, I75 at US 25, Mt. Vernon
12 Scott, I75 at rest area, Georgetown
13 Shelby, I64 at KY 53, Shelbyville
14 Woodford, I64 at KY 341, Midway
15 Trigg, I24 at US 68, Cadiz
16 Pike, US 460 at KY 122, Shelbiana
17 Daviess, US 60 at KY 144, Owensboro
18 Hardin, US 31W at KY 835, West Point
19 Perry, KY 15X at KY 476, Hazard
20 Knox, US 25E at KY 225, Barbourville
21 Harlan, US 119 at KY 179, Cumberland
22 Floyd, KY 80 at US 23, Allen
23 Bullitt, US 31E at KY 44, Mt. Washington
24 Carter, KY 1 at I64, Grayson
25 Laurel, US 25 at KY 80, London
26 Mason, US 62 at KY 11, Maysville
27 Clay, US 421 at KY 80, Manchester
28 Bourbon,US68 at 5th St., Millersburg
29 Casey, US 127 at KY 70, Liberty
30 Meade, US 31W at KY 1638, Muldraugh
31 Lincoln, US127 at KY 78, Hustonville
32 Russell,US127 at KY80,Russell Sprgs.
33 Washington,US 150 at KY 55, Springfield
34 Cumberland, KY 90 at KY 61, Burkesville
35 Ballard, US 60 at KY 358, LaCenter
36 Fayette, KY 418 at I75, Lexington
37 Christian, US 41 at KY 1682, Hopkinsville
38 McCracken, US 62 at US 68, Reidland
39 Madison, KY 52 at KY 876, Richmond
40 Barren, KY 255 at US 31W, Park City
41 Nelson, US 62 at KY 48, Bloomfield
42 Boone, KY 18 at KY 237, Burlington
43 Oldham, KY 146 at KY 393, Buckner
44 Knox, KY 11 at US 25E, Barbourville
45 Henderson, KY 145 at US 60, Corydon
46 Boyle, US 68 at US 150, Perryville
47 Greenup, KY 1 at US 23, Greenup
48 Caldwell,KY 139 at Jefferson, Princeton
49 Grayson, US 62 at KY 259, Leitchfield
50 Allen, US 231 at US 31E, Scottsville
51 Bath, US 60 at KY36, Owingsville
52 Larue, KY 84 at KY 61, Hodgenville
53 Scott, US 62 at I75, Georgetown
54 Anderson, US 127 at US 127B, Lawrenceburg
55 Breathitt, KY 30 at KY 15, Jackson
56 Webster, US 41 at KY 56, Sebree
57 Garrard, KY 39 at US 27, Lancaster
58 Carroll, US 42 at 6th Street, Carrollton
59 Elliott, KY 32 at KY 7, Sandy Hook
60 McCracken, KY 1286 at US 62, Paducah
61 Harlan, KY 840 at US 119, Loyall
62 Greenup, KY 7 at US 23, South Shore
63 Lewis, KY 10 at KY 57, Tollesboro
64 Simpson, KY 73 at KY 100, Franklin
65 Adair, KY 55 at KY 80, Columbia
66 Taylor, KY 208 at US 68, Campbellsville
67 Kenton, I275 at KY 17, Covington
68 Kenton,I75 at KY 371, Crescent Springs
69 Fayette, I75 at US 68, Lexington
70 Jefferson, I64 at KY 1747, Louisville
71 Jefferson, I65 at KY 1631, Louisville
72 Jefferson, I264 at US 31E, Louisville
73 Jefferson, I264 at US 42, Louisville
74 Jefferson, I264 at US 60, Louisville
75 Warren, I65 at US 231, Bowling Green
76 Boone, I71 at KY 14, Verona
77 Jefferson, US 31W at Gagel, Louisville
78 Jefferson,KY 1447 at Hubbards, Louisville
79 Jefferson,KY 1703 at Trevillian,Louisville
80 Fayette, US 27 at KY 1683, Lexington
81 Fayette, Reynolds at Lansdowne, Lexington
82 Fayette, KY 4 at KY 353, Lexington
83 Kenton, US 25 at KY 236, Covington
84 Kenton, KY 8 at KY 17, Covington
85 Kenton, KY 16 at KY 177, Covington
86 Fayette, US 25 at Fontaine, Lexington
87 Campbell, US 27 at Carothers, Newport
88 Christian, US 41 at 9th, Hopkinsville
89 Hopkins, US 41A at KY 70, Madisonville
90 Pulaski, US 27 at KY 80, Somerset
91 Franklin, US 60 at Sunset, Frankfort
92 Henderson, US 41A at First St., Henderson
93 Nelson, US 31E at Beall, Bardstown
94 Barren, US 68 at Race St., Glasgow
95 Clark, US 60 at KY 1958, Winchester
96 Warren, US 31W at US 231, Bowling Green
97 Anderson, US 62 at US 127, Lawrenceburg
98 Rowan, US 60 at KY 32, Morehead
99 Hardin, Poplar at Sycamore, Elizabethtown
100 Kenton, KY 1072 at Highland, Covington

TABLE A-1. SUMMARY OF DATA

			FRONT-SEAT PASSENGERS								FRONT AND REAR					
	DRIVERS		4-5 Years		6-12 Years		13-19 Years		OVER 19 Years		UNDER 4 Years		1-3 Years		UNDER 1 Year	
LOCATION NUMBER	SAMPLE	USAGE*	SAMPLE	USAGE	SAMPLE	USAGE	SAMPLE	USAGE	SAMPLE	USAGE	SAMPLE	USAGE	SAMPLE	USAGE	SAMPLE	USAGE
1	269	76	3	67	5	80	8	63	54	70	3	67	4	75	2	100
2	730	72	2	100	10	60	26	50	152	72	5	60	15	67	2	100
3	517	77	10	70	19	74	34	71	192	72	15	87	15	93	14	93
4	279	77	2	50	3	33	17	35	144	67	3	67	11	82	2	100
5	595	72	8	50	30	57	51	61	259	75	14	29	27	44	2	50
6	453	77	2	100	14	79	17	82	212	71	8	75	12	75	6	83
7	595	53	19	37	10	40	11	73	122	43	6	33	10	30	1	100
8	687	73	2	0	2	50	7	57	172	63	3	67	6	67	2	100
9	759	61	5	40	4	50	25	48	280	57	6	67	9	78	1	100
10	319	56	1	100	11	55	11	73	86	59	2	100	10	60	1	100
11	314	63	5	40	12	42	20	65	132	64	7	57	13	62	4	75
12	357	66	5	60	8	63	24	58	158	74	8	63	17	59	5	100
13	441	57	5	60	11	73	21	57	113	64	11	73	11	73	5	80
14	248	73	4	50	5	40	15	60	63	70	2	100	7	86	1	100
15	395	84	2	100	6	83	23	61	140	83	1	100	6	83	1	100
16	906	49	6	50	17	35	54	33	230	44	4	50	17	76	2	100
17	1,405	53	12	75	39	51	59	53	245	51	20	70	35	80	7	86
18	1,742	61	22	55	50	58	79	53	465	66	31	48	52	50	27	63
19	1,524	49	24	29	33	55	29	34	330	42	31	55	46	59	13	69
20	1,498	43	26	23	30	27	74	30	500	41	34	38	39	59	19	58
21	570	39	16	44	20	25	27	26	223	30	11	9	13	31	4	50
22	929	59	10	50	15	53	68	46	217	50	6	50	15	67	2	100
23	1,277	51	12	25	47	55	78	44	240	54	27	56	46	70	10	60
24	963	53	12	58	17	59	70	40	256	45	11	73	21	86	4	100
25	1,586	44	39	44	22	32	41	49	403	42	45	47	63	54	13	85
26	1,718	47	29	41	42	43	126	45	372	48	37	46	54	57	12	58
27	1,027	36	19	21	37	19	80	29	292	29	29	24	42	45	9	56
28	845	52	12	50	13	54	30	40	224	57	14	36	15	47	7	86
29	816	35	18	11	25	28	69	26	227	36	13	46	13	46	3	100
30	1,720	60	17	65	36	61	91	52	382	63	25	56	38	63	23	78
31	423	57	5	40	5	60	17	53	105	61	11	45	9	56	3	33
32	980	46	13	23	36	44	53	38	235	46	27	41	30	33	15	73
33	849	45	19	47	18	33	37	59	170	46	19	53	25	64	3	67
34	789	35	15	27	11	18	29	31	134	45	26	31	27	33	10	50
35	1,030	43	12	42	18	56	76	74	253	48	27	52	29	59	16	63
36	1,042	57	11	27	12	42	29	41	256	58	12	100	21	71	6	100
37	831	50	18	56	20	50	50	50	199	48	22	64	29	59	22	82
38	1,138	54	13	62	36	50	86	57	188	53	23	70	36	78	13	69
39	1,272	59	14	86	23	65	45	56	220	54	24	71	33	79	9	89
40	432	44	6	17	22	32	21	48	115	45	10	40	9	22	4	50
41	366	38	7	0	10	30	25	24	104	39	8	25	9	56	5	60
42	1,395	55	17	59	19	84	32	69	211	60	27	81	34	88	12	92
43	1,208	51	16	50	49	65	99	52	181	47	30	67	40	63	18	72
44	1,122	44	16	44	5	60	38	34	356	41	20	40	25	52	8	75
45	428	38	6	67	12	50	56	36	112	39	16	38	18	33	11	45
46	493	51	10	30	14	43	26	31	114	46	7	43	10	40	4	100
47	697	40	16	19	21	38	55	38	160	40	16	63	19	58	6	100
48	1,331	45	13	62	18	61	57	26	223	35	21	38	42	71	3	67
49	1,452	48	23	30	28	54	123	35	243	44	24	71	40	68	6	100
50	600	45	4	25	8	38	20	35	134	46	14	43	15	40	8	75
51	804	24	25	20	18	17	40	25	187	21	23	30	24	33	4	25
52	233	44	4	50	10	60	22	41	71	48	4	25	9	44	2	100
53	671	60	8	63	10	80	16	63	197	72	15	67	17	71	3	100
54	848	59	14	57	4	25	19	53	205	50	9	78	16	75	6	100

TABLE A-1. SUMMARY OF DATA (continued)

			FRONT-SEAT PASSENGERS								FRONT AND REAR					
	DRIVERS		4-5 Years		6-12 Years		13-19 Years		OVER 19 Years		UNDER 4 Years		1-3 Years		UNDER 1 Year	
LOCATION NUMBER	SAMPLE	USAGE*	SAMPLE	USAGE	SAMPLE	USAGE	SAMPLE	USAGE	SAMPLE	USAGE	SAMPLE	USAGE	SAMPLE	USAGE	SAMPLE	USAGE
55	848	43	16	31	13	31	32	28	191	41	33	36	39	36	8	75
56	686	40	6	50	15	40	25	32	129	41	12	50	25	56	3	100
57	390	36	8	63	6	33	18	22	91	25	10	40	18	61	7	71
58	1,199	47	25	44	11	64	23	57	232	49	18	39	22	50	10	70
59	336	31	17	18	11	45	21	43	69	22	10	0	15	7	1	100
60	726	61	9	67	14	79	35	66	115	63	12	75	14	93	8	75
61	291	36	6	50	4	75	14	29	67	27	7	71	10	50	2	50
62	573	34	10	30	16	50	34	29	124	34	8	63	18	67	3	100
63	385	33	9	0	14	29	38	18	84	33	10	20	16	38	6	33
64	188	28	2	50	3	0	5	20	37	22	9	33	11	36	7	57
65	1,701	37	36	33	77	32	145	28	332	42	57	37	60	35	33	45
66	291	36	6	50	4	75	14	29	67	27	7	71	10	50	2	50
67	954	66	12	83	24	79	52	56	135	64	9	100	23	83	10	100
68	1,838	61	15	53	12	58	42	57	258	54	13	62	23	74	8	100
69	857	64	4	25	11	64	38	55	175	57	6	67	14	79	4	75
70	1,393	69	19	68	20	80	55	73	234	76	16	94	28	82	9	100
71	2,023	56	15	40	22	59	62	45	245	51	26	73	24	75	12	92
72	1,766	67	30	63	28	68	45	56	334	61	29	66	55	71	15	93
73	1,504	77	17	65	24	71	38	89	207	69	16	94	29	97	5	100
74	1,064	72	5	80	17	82	78	69	160	70	12	83	17	88	4	100
75	1,323	66	48	44	75	47	131	55	360	62	61	48	65	62	52	60
76	225	56	3	67	5	80	10	60	51	49	6	67	10	70	4	100
77	1,543	57	8	75	24	63	61	51	270	55	18	72	36	81	12	100
78	1,443	73	25	88	39	85	44	75	244	67	19	89	46	98	11	91
79	1,282	67	17	65	12	75	22	59	144	57	20	85	24	75	12	100
80	2,096	68	21	81	30	83	114	59	403	72	26	81	36	81	22	95
81	856	66	9	56	7	71	22	45	113	58	13	77	40	75	5	100
82	1,266	64	17	35	12	75	38	71	254	54	26	69	43	67	4	50
83	2,088	51	31	42	19	53	35	37	390	48	37	59	60	67	17	100
84	1,708	51	23	30	21	38	49	43	252	52	18	61	30	63	4	50
85	1,312	42	30	37	40	40	96	36	270	37	27	22	47	36	8	38
86	1,787	69	21	81	28	82	81	57	351	65	16	50	38	68	0	NA
87	1,498	45	14	50	25	44	101	36	218	38	13	77	43	77	8	100
88	1,582	58	14	57	32	59	72	43	258	50	24	75	41	76	9	89
89	1,726	63	23	65	27	74	73	58	253	57	20	75	41	85	7	86
90	1,755	54	21	38	27	41	61	57	251	52	47	55	66	58	26	69
91	2,305	64	18	61	16	56	29	55	371	60	13	77	21	67	7	100
92	1,591	54	16	56	49	59	109	43	296	52	15	60	43	74	7	86
93	1,643	50	40	58	34	56	58	52	283	51	44	64	54	70	25	88
94	1,466	44	12	33	21	48	54	48	222	48	32	50	46	59	11	73
95	908	55	29	52	13	62	22	68	237	50	30	60	49	71	4	75
96	2,181	54	57	42	63	51	240	41	399	43	82	61	122	62	92	57
97	1,043	40	24	29	9	33	14	14	211	42	37	49	64	52	14	93
98	862	53	11	45	4	100	30	47	199	51	16	88	31	84	2	100
99	1,381	55	28	54	63	63	108	51	214	50	27	33	47	49	23	74
100	1,520	58	15	80	34	44	105	47	184	49	24	75	50	84	6	100