Research Report
KTC-07-24/KSP1-06-2F

KENTUCKY TRANSPORTATION CENTER

# 2007 SAFETY BELT USAGE SURVEY IN KENTUCKY

UNIVERSITY OF KENTUCKY
College of Engineering

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**We provide services to the transportation community** through research, technology transfer and education. We create and participate in partnerships to promote safe and effective transportation systems.

## OUR VALUES

**Teamwork**
Listening and communicating along with courtesy and respect for others.

**Honesty and Ethical Behavior**
Delivering the highest quality products and services.

**Continuous Improvement**
In all that we do.

**Research Report**
**KTC-07-24/KSP1-06-2F**

# 2007 SAFETY BELT USAGE SURVEY IN KENTUCKY

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in cooperation with
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Commonwealth of Kentucky



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## EXECUTIVE SUMMARY

The objective of this study was to establish 2007 safety belt and child safety seat usage rates in Kentucky. The 2007 survey continues to document the results after enactment of the original "secondary enforcement" statewide mandatory safety belt law in 1994 and the change to "primary enforcement" which was enacted in 2006. Data were collected at 200 randomly selected sites spread across Kentucky. Data from the individual sites were combined into a statewide percentage considering roadway functional classification, geographic region, and vehicle miles traveled.

The data show that the usage rate in 2007 (71.8 percent) increased several percentage points compared to 2006 (67.2 percent). Considering data taken after the original statewide law, this compares to 66.6 in 2005, 66.0 in 2004, 65.5 percent in 2003, 62.0 percent in 2002, 61.9 percent in 2001, 60 percent in 2000, 59 percent in 1999, 54 percent in 1998, 1997 and 1995, 55 percent in 1996, and 58 percent in 1994. The current usage is substantially above the 1993 level, prior to enactment of the original statewide law, of 42 percent.

The 2007 statewide usage rate for children under the age of four was determined to be 98.5 percent. This is the highest rate found for this age category.

The statewide law was changed in 2006 to allow primary enforcement. An educational period extended through December 2006 with warning citations given. Enforcement with fines started in January 2007. Enactment of the primary enforcement law, without education and enforcement, did not result in a substantial increase in usage. The significant increase in usage started when enforcement, with accompanying publicity and education, started in 2007.

## 1.0 INTRODUCTION AND BACKGROUND

The use of safety belts and child safety seats has been shown to be an effective means to reduce the injuries of motor-vehicle occupants involved in a traffic crash. There have been various methods used in an attempt to increase safety belt and safety seat usage. Past efforts have included public information campaigns, both local and statewide legislation, and enforcement of the legislation. Examples of statewide enforcement and education campaigns are the “Click It or Ticket” and “Buckle Up Kentucky: It’s the Law & It’s Enforced” campaigns conducted around Memorial Day in recent years. The most recent legislation in Kentucky in this area was changing the statewide legislation requiring the use of safety belts for all vehicle occupants from secondary to primary enforcement. A statewide law including secondary enforcement was passed in 1994 with the primary enforcement law passed in 2006. This law had an effective date of July 2006. However, the 2006 law included an educational period with warning citations through December 2006 with citations with fines starting in January 2007.

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 this law by adding a fine. Next, prior to the statewide law, local safety belt usage laws were enacted in several jurisdictions in Kentucky. The first such local law, with an effective date of July 1990, was enacted by the Lexington-Fayette Urban County Government. 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 original statewide law in 1994 replaced the various local ordinances.

Statewide observational surveys were first conducted in Kentucky in 1982 and have been conducted annually to document safety belt and safety seat usage. The safety belt usage rate for drivers increased each survey year from only 4 percent in 1982 to 58 percent in 1994 after enactment of the statewide law. The first decrease was in 1995 when usage decreased to 54 percent with the rate remaining fairly constant at 54 to 55 percent for 1996 through 1998. The rate then increased to 59 percent in 1999, 60 percent in 2000, 62 percent in 2001 and 2002, 65.5 percent in 2003, 66.0 percent in 2004, 66.7 percent in 2005, and 67.2 percent in 2006.

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 30 percent for 1984 through 1986. After a financial penalty was added to the law, this percentage increased to almost 50 percent in 1988. There has been a continued increase in usage with rates such as 72 percent in 1994, 82 percent in 1997, and 96 percent in 2004. However, while usage rates are very high, studies have found problems with the proper use of child safety seats.

The objective of the survey summarized in this report was to establish statewide safety belt and child safety seat usage rates in Kentucky for 2007. These rates can be compared to those determined from previous surveys.

The 2007 statewide survey also documented the change in usage associated with the change in the law to allow primary enforcement (enforcement with a penalty started in January 2007). The statewide survey data can also be compared to data taken before and during education and enforcement activities occurring around Memorial Day. Mini-surveys found the usage rate increased from a baseline of 73.0 percent in April 2007 to 76.2 percent during the enforcement portion of the "Buckle Up Kentucky: It's the Law & It's Enforced" campaign. Data collected for the statewide survey summarized in this report were taken in the weeks immediately after completion of the campaign's enforcement and publicity activities.

# 2.0 PROCEDURE

## 2.1 DATA COLLECTION PROCEDURE

The original data collection procedure used in the surveys, which started in 1982, was first modified for the 1990 survey. The site selection procedure used for the first several surveys was changed 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 procedure and data collection form remained the same for the 1990 through 1998 surveys. A modification starting with the 1999 survey was that the age and sex of the driver and front seat occupants were not classified. The type of vehicle was coded instead of the age and sex information.

The data collection form first used in the 1999 survey is shown in Figure 1. This form was used for the 2007 survey. Safety belt usage is recorded for drivers as well as front-seat passengers sitting in the outboard position. These occupant positions are equipped with the combination lap belt/shoulder harness type of safety belt which enables observations to be performed more easily than positions equipped only with a lap belt. The exception is for children under four years of age with data collected for both the front and rear seats.

The type of vehicle is coded for drivers and front seat passengers. Four categories of vehicles are used. These are: passenger car (PC), pickup (PU), van, and sports utility vehicle (SUV).

For drivers and front-seat passengers (over three years of age), usage is classified as either using a harness or belt or not using a restraint. For children one to three years of age, the categories include safety seat, booster seat, harness or belt, or no restraint. For children under one year of age, the categories are either safety seat or no restraint.

Two additional types of information are obtained. Starting with the 1993 survey, the use of motorcycle helmets was noted. The 1997 survey was the first in which the use of bicycle helmets was noted.

Each data collector is provided with a training period prior to beginning data collection. As part of the training, the data collectors review the guidelines and previous reports and collect trial sets of field data. The observers then collect data simultaneously at a sample of different types of locations. The data were then reviewed by the project manager before formal data collection was started.

The quality control of the data was the responsibility of the project manager. This included a review of completed data collection forms as the survey progressed to check for any problem areas or questionable data.

The following list of guidelines for data collection was given to each observer.

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

2. Data are typically collected at intersections with each observer collecting data on only one approach at the intersection.

3. Include all vehicles on the approach 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.

4. If traffic volume is too high to obtain data for all vehicles, record data for the next vehicle in view after recording the previous data.

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 slowly or from an observation point such that the occupants can be readily observed.

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

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

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

11. Collect two "observer hours" of data at each site. This could be two hours for one approach or one hour for two approaches if the route has two approaches at the intersection.

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

13. Collect data for specified types of passenger motor vehicles (cars, pickup trucks, vans, and sport utility vehicles). Data are not collected for combination trucks.

14. Collect data for both in-state and out-of-state vehicles.

15. If a problem such as weather or road construction prevents data from being collected on the assigned day and time for a specific location, a new day and time will be randomly selected by the project manager for data collection.

16. The time period in which data are collected at specific sites are randomly assigned to the data collectors by the project manager. Data are typically collected during weekdays with occasional data collected on a weekend.

Data collection was started after June 3 which was the end of the education and enforcement activities associated with the Memorial Day holiday, and continued through the first week of August. As noted, data were collected for two hours at each location. This consisted of either two hours for one observer or one hour using two observers on different approaches for the specified route. The decision was made to collect data for an equal time period for each location rather than attempt to collect a given sample size.

## 2.2 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 were 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. An initial change was made in 1990 and resulted in 100 sites. The distribution of the sites was based on vehicle miles traveled statewide for various categories of roads in counties with varying populations. The variables considered in the 1990 stratification process were the rural or urban designation of the road, the functional classification of the road, vehicle miles traveled, and the county population. However, a new sampling design plan was implemented in 1999 as part of a nationwide effort by the National Highway Traffic Safety Administration (NHTSA) to use a common methodology in all states to select observational sites.

As part of the sampling design plan started in 1999, the decision was made to collect data at 200 sites. It was also decided that data would typically be obtained at intersections. For interstates and parkways, data were generally taken at the intersection of a ramp with a cross road. The basis for collecting data at intersections was that it would increase accuracy since data would be collected for vehicles either stopped or moving slowly.

A computer file was used to select the locations. The file is the Highway Performance Monitoring System (HPMS). Characteristics of road segments for all state maintained roads are contained in this file. In order to assure that the sampling design used an acceptable methodology, the various decisions made in the process were made with consultation with NHTSA with the roadway segments containing the data collection sites selected by NHTSA.

Kentucky has 120 counties ranging in population from slightly over 2,000 to almost 700,000. The NHTSA guidelines allow exclusion from the survey coverage of the least populated units (counties in Kentucky) which represent 15 percent of the state's population. This exclusion reduced the number of counties in the sample from 120 to 65. All the road segments contained in the HPMS file in the counties representing 85 percent of the population were eligible for inclusion in the survey.

Road segments were stratified into three geographical regions based on highway district. There are 12 highway districts in Kentucky. Roadways in each of the three regions were divided into seven roadway functional classification groups. This resulted in 21 stratum from which the sample was selected. The geographical regions were:

Region 1: Highway Districts 1 through 4 (represents the western portion of the state),
Region 2: Highway Districts 5 through 7 (covers the north central area of the state which includes the major population centers of Louisville, Lexington, and northern Kentucky), and
Region 3: Highway Districts 8 through 12 (includes the eastern and south central portion of the state)

There are 44 counties in Region 1, 31 in Region 2, and 45 in Region 3. The state's population is divided into 29 percent in Region 1, 46 percent in Region 2, and 25 percent in Region 3. For reporting purposes, Region 1 is referred to as the West, Region 2 as the North, and Region 3 as the East. The locations of these regions are shown in Figure 2.

The following seven functional classification categories were used:

1. rural interstate,
2. rural principal arterial,
3. rural minor arterial/major collector,
4. rural minor collector/local,
5. urban interstate/freeway,
6. urban principal arterial, and
7. urban minor arterial/collector/local.

Selections were made from roadway segments which contained either an interchange, an intersection with a stop sign, an intersection with a traffic signal, or a combination of these features. A segment could contain more than one intersection or interchange. If a segment had more than one intersection with a stop sign or signal or interchange, one intersection was randomly selected. For example, if a segment had three intersections with signals, a separate number of one, two, or three was randomly selected. The random number assigned the intersection to be selected for data collection (along the route as it was driven in its cardinal direction).

An equal probability selection (simple random sample) of the road segments was made within each of the 21 strata using the HPMS file as the source of the necessary road segment information. Following is the number of segments selected in each strata.

| | Region 1 | Region 2 | Region 3 | All |
|---|---|---|---|---|
| Rural Interstate | 8 | 12 | 6 | 26 |
| Rural Principal Arterial | 12 | 6 | 12 | 30 |
| Rural Minor Arterial/ Major Collector | 12 | 10 | 12 | 34 |
| Rural Minor Collector/Local | 8 | 6 | 8 | 22 |
| Urban Interstate/Freeway | 6 | 20 | 2 | 28 |
| Urban Principal Arterial | 10 | 14 | 6 | 30 |
| Urban Minor Arterial/ Collector/Local | 10 | 14 | 6 | 30 |
| All | 66 | 82 | 52 | 200 |

For each selected road segment, information was printed from the HPMS file to be used to select a specific location for data collection. This information included the county, route, beginning and ending milepoint, the number of intersections or interchanges within the segment, and a counter showing which intersection or interchange to select if there was more than one within the segment.

A list of the 120 counties in Kentucky along with their population, the number of sites in each county, and their region in the state is given in Appendix A. A road segment was selected in 58 counties. The largest number of segments was 20 in Jefferson County. A list of the intersections or interchanges where data was collected within each of these segments is given in Table 1. For each site, the county, route, and intersecting route (or exit number for an interstate or parkway) are given. The nearest town to the data collection site is also listed along with the geographical region and functional classification. For interstates, data were typically collected at the intersection of the ramps and the intersecting road at interchanges. The exception was for some rural interchanges where there were very few exiting vehicles with data collected on the mainline at these locations.

The observation sites were randomly ordered to assist in the sequence of sites at which data were collected. When the data were collected, some of the sites were grouped based on geographical region to aid the efficiency of the data collection process.

## 2.3 SURVEY DATA ANALYSIS

As part of the summary of information from the HPMS file for each randomly selected roadway segment, the functional classification, region, and vehicle miles traveled for that segment were listed. The total vehicle miles for the road segments in each of the 21 stratum were also summarized and were used in the estimation process.

The survey data were input into an EXCEL spreadsheet to summarize the data and obtain the results. The results for each survey site were reviewed to determine if there were any possible problems with either the data collection or input. The computer results were checked manually if a potential problem was observed. A second set of data was collected if the data at a specific site was substantially inconsistent with other data.

Safety belt usage rates were determined for the driver and for all front-seat occupants. Rates were also obtained by vehicle type for both the driver and all front-seat occupants. For children under four years of age, usage rates were obtained for both front- and rear-seating positions, as well as for combined seating positions. Statewide rates were obtained, using an EXCEL spreadsheet analysis, by weighting the usage determined for each location by the vehicle miles traveled in the road segment.

Various usage rates were determined for each location. The rates were for drivers, front seat passengers, all front-seat occupants, and all children under four years of age (front and rear). The rate for each of the 21 stratum (based on region and functional classification categories) were determined by weighting the usage rate for each location by the proportion of the vehicle miles traveled at that location of the vehicle miles at all observational sites in the stratum.

A statewide rate was then determined using the usage rate determined for each stratum and the total vehicle miles traveled in that stratum (statewide for the counties representing 85 percent of the population). The statewide rate was the sum of the products of the usage rate for each stratum and the proportion of the vehicle miles traveled in that stratum of the total statewide vehicle miles.

A consultant was initially used to review the procedures necessary to conduct the various statistical tests. The variance, bound on the error of estimation (which is half of the 95 percent confidence interval), and relative error were calculated for the statewide usage rate for all front seat passengers. These data were also determined for each of the 21 strata, the three regions, and the seven functional classes. The software initially used in this analysis was Statistical Analysis Software (SAS) for Windows, version 8. An EXCEL spreadsheet analysis is currently used to obtain the necessary statistical tests. The relative error and confidence interval was also determined at each location for the usage rate found for all front seat occupants.

## 3.0 SURVEY RESULTS

Usage rates for all front seat occupants (drivers and passengers) for the various types of highways and regions of the state are summarized in Table 2. The overall statewide rate in 2007, using the data collected at 200 sites and the described weighting procedure, was 71.8 percent. The 95 percent confidence interval was 0.3 percent. The sample size of all front seat occupants was 115,524 . The usage rate by region varied from 76.2 percent in Region 2 (north) to 62.8 percent in Region 3 (east) with 71.0 percent in Region 1 (west).

The highest rate by the functional classification of the highway was 80.5 percent for rural interstates with the lowest 62.6 percent for rural minor collector/local roads. The relative error and confidence interval for the usage rates found for all front seat occupants (by region and highway functional classification) are given in Appendix B.

Usage rates for drivers for the various types of highways and regions of the state are summarized in Table 3. The overall statewide rate for drivers in 2007 was 71.9 percent. Drivers accounted for 76 percent of front seat occupants so they dominated the percentage determined for all front seat occupants. Usage rates for front seat passengers was 71.2 percent (Table 4).

Usage rates for children under four years of age are given in Table 5. These rates are for children in both the front and the rear seats. The usage rate for children under one year of age (99.8 percent) was higher than that for children one to three years of age (98.1 percent). The usage rate for the combination of these categories, or children under four years of age, was 98.5 percent.

The sample size for children under four years of age was 1,038. This age category corresponds to the children for which the mandatory child restraint law would apply. The 2007 usage rate of 98.5 percent is the highest percentage found and compares to the previous high of

96.0 percent in 2004. This percentage was about 15 percent in 1982 before enactment of the child restraint law, 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 98 percent for the rear seat compared to 76 percent for the front seat. For children under one year old, the usage rate was 100 percent for the rear seat compared to 98 percent for the front seat. The large majority of children were sitting in the rear seat for both age groups (about 92 percent for one to three years of age and 94 percent for under one). The overall percentage of children in the rear seat of 93 percent in 2007 compares to 86 percent in 2006, 90 in 2004 and 2005, and 88 percent in 2003.

A summary of the data collected is given in Appendix C. For each of the 200 data sites, the usage rate and sample size are given for all front seat occupants, drivers, front-seat passengers, and children under four years of age (both front and rear seat). The relative error and confidence interval are given for the "all front seat occupant" category. Usage rates for front seat occupants ranged from 43 percent (a rural location in Harlan County) to 90 percent (an urban interstate location in Fayette County). There were only five sites which had a usage rate of under 50 percent with all at a rural location and three in the rural minor collector/local category. Four of the five locations were in the east region. There were 42 sites which had a usage rate of 80 percent or more with all except four being an interstate or parkway. The highest rate found on a non-interstate or parkway was 82 percent on an urban principal arterial road (US 68 at Ft. Harrod Drive in Fayette County).

While the data collection procedure changed in 1990 and 1999, the usage rate may still be compared to the statewide rates from past years (Table 6). The previous studies showed that statewide driver usage rates steadily increased from 4 percent in 1982 to 42 percent in 1993. However, the amount of the yearly increase had decreased over this time period. Only a three percentage point increase occurred in the two-year period from 1991 to 1993. The 58 percent usage in the 1994 survey showed that a dramatic increase occurred between the 1993 and 1994 data collection periods. This increase was directly related to the enactment of a statewide safety belt law. The 1995 survey showed that driver usage (54 percent) remained substantially higher than before enactment of the law, but there was a slight decrease in usage from the 1994 rate immediately after enactment of the law. This level continued through 1998, before an increase to 59 percent in 1999. The increase in usage continued with 60 percent in 2000, 61.9 percent in 2001, 62.0 in 2002, 65.5 percent in 2003, 66.0 in 2004, 66.7 percent in 2005, and 67.2 percent in 2006. The substantial increase in 2007 to 71.8 percent would be related to the change in July 2006 to a primary safety law (with enforcement with fines started in January 2007).

A substantial difference in usage rate (for all front seat occupants) was noted when vehicle type is considered (Table 7). The rate varied substantially from 78.1 for vans and 76.3 percent for sport utility vehicles to 60.1 percent for pickup trucks. The rate for passenger cars was 74.6 percent. It can be seen that use of safety belts is much lower in pickup trucks than any other

vehicle type, and pickup trucks made up about 24 percent of the sample. The largest portion of the sample was for passenger cars with 46 percent followed by 19 percent for sport utility vehicles and 11 percent for vans.

Helmet use by motorcyclists was also observed. Kentucky had a statewide law requiring the use of a helmet by a motorcyclist until it was repealed starting July 15, 1998. The results of surveys taken during the mandatory usage period had found a usage rate of over 95 percent. Data were taken in 1998 both before and after the effective date of the repeal. Prior to July 15, 1998 only 10 of the 240 observed motorcyclists were not wearing a helmet (giving a usage rate of 96 percent). After this date, 29 of 148 motorcyclists were observed not wearing a helmet giving a usage rate of 76 percent.

In 1999, only 164 of 452 motorcyclists were observed not wearing a helmet with a weighted usage rate of 65 percent. The weighted rate for 2000 was 70 percent with a sample size of 427. The weighted rate decreased to 56 percent in 2001 with a sample size of 395, 57 percent in 2002 with a sample size of 596, 56 percent in 2003 with a sample size of 512, 58 percent in 2004 with a sample size of 631, 59 percent in 2005 with a sample size of 918, and 60 percent in 2006 with a sample size of 949. Usage was very similar in 2007 with a usage rate of 56 percent with a sample size of 897. The usage rate was slightly higher in the west region of the state with 58 percent compared to 55 percent in the east and north regions.

Bicycle helmet use was observed for only 62 bicyclists in 2007 with 18 wearing a helmet (29 percent). This rate compared to 43 percent in 2006, 14 percent in 2005, 8 percent in 2004, 19 percent in 2003, 9 percent in 2002, 18 percent in 2001, 24 percent in 2000, and 12 percent in 2001. The very small sample size does not allow any conclusion about trends but does support the opinion that the usage rate has been very low.

## 4.0 SUMMARY

Observations were taken at 200 sites across Kentucky to obtain safety belt usage rates. The 2007 survey resulted in a sample size of 115,524 front seat occupants (including 88,248 drivers). The data collection procedure and site selection criteria were based on national criteria.

A “secondary enforcement” statewide safety belt law was passed in Kentucky in 1994 with a law allowing “primary enforcement” enacted in 2006. The 2006 law allowed fines starting in January 2007 with an education period from July through December 2006. The law applies to all vehicle occupants. Prior to the original 2004 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 front seat occupants increased from 42 percent in 1993 to 58 percent in 1994. It then decreased slightly to between 54 and 55 percent in 1995 through 1998. The usage rate of 58.6 percent in 1999 showed that the rate had increased to a level similar to that found immediately after enactment of the

statewide law. There was a small increase in usage to 59.8 percent in 2000 with a larger increase rate in 2001 to 61.9 percent. The rate stayed at 62.0 percent in 2002 before increasing to 65.5 percent in 2003, 66.0 in 2004, 66.7 percent in 2005, 67.2 percent in 2006, and 71.8 percent in 2007. The trend in usage rates from 1982 through 2007 is given in Table 6.

The usage rate was highest in the region of the state which included the largest population centers (Louisville, Lexington, and northern Kentucky). Usage was highest on interstates and lowest on local roads. When type of vehicle was considered, usage was highest for vans and sport utility vehicles and lowest for pickup trucks.

The statewide usage rate for children under the age of four (including both the front and rear seat) was determined to be 98.5 percent in 2007. This compares to 94.0 percent in 2006, 94.4 percent in 2005, 96.0 percent in 2004, 94.8 percent in 2003, 92.9 percent in 2002, 89 percent in 2001, and 87 percent in 2000. One reason for the very high usage for small children is that primary, rather than secondary, enforcement has applied for many years.

The motorcycle helmet law was repealed in 1998. There had been a very high compliance with the requirement to wear a helmet (over 95 percent), but the helmet usage percentage has decreased to 56 percent in 2007. This shows the large decrease in usage related to the repeal of the mandatory usage law. The percentage of a small sample of bicyclists observed wearing a safety helmet was low.

## 5.0 RECOMMENDATIONS

The data show that the level of safety belt usage in 2007 is the highest since the start of the surveys in 1982. The large increase in 2007 compared to 2006 (67.2 to 71.8 percent), can be related to enactment of the primary safety belt law (with fines issued starting in January 2007) and related education and enforcement activities.

The statewide usage rate of 71.8 percent (with 74.0 percent at the mini-survey portion of the statewide sample) decreased from 76.2 percent at the mini-survey locations during the "Buckle Up Kentucky: It's the Law & It's Enforced" enforcement campaign around Memorial Day. The data show that knowledge of an increased possibility of receiving a ticket is required for a certain segment of the driving population to increase their use of safety belts. The first step in obtaining a meaningful increase in safety belt use was achieved by changing the law from secondary to primary enforcement. The primary enforcement law must continue to be enforced with the associated fine (along with the necessary publicity) to provide an awareness to the public that the law is being enforced.

The survey data can be used to identify areas most in need of enforcement and education. Specifically, usage was lowest in the east region of the state. Also, usage was substantially lower for occupants of pickup trucks compared to other vehicle types.

The low usage rate for motorcycle helmets continues to show the results of the repeal of the mandatory helmet law. This corresponds to an increase in the number of injuries in motorcycle crashes. Consideration should be given to enactment of a motorcycle helmet law.

Figure 1. Data Collection Form

# SAFETY BELT DATA COLLECTION FORM

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

Location:_____ Sheet #:_____

Observer:_____ Comment:_____

## DRIVER USAGE

| Vehicle | Harness or Belt | None |
|---|---|---|
| PC | | |
| PU | | |
| VAN | | |
| SUV | | |

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

| Vehicle | Harness or Belt | None |
|---|---|---|
| PC | | |
| PU | | |
| VAN | | |
| SUV | | |

## USAGE FOR CHILDREN (1-3 YEARS OF AGE)

| Position | Safety Seat | Booster Seat | Harness or Belt | None |
|---|---|---|---|---|
| FRONT | | | | |
| REAR | | | | |

## USAGE FOR INFANTS (UNDER 1 YEAR OF AGE)

| Position | Safety Seat | None |
|---|---|---|
| FRONT | | |
| REAR | | |

## USAGE OF MOTORCYCLE HELMET

| YES | No |
|---|---|
| | |

## USAGE OF BICYCLE HELMET

| YES | No |
|---|---|
| | |

4/1998

Figure 2. Data Collection Location Regions

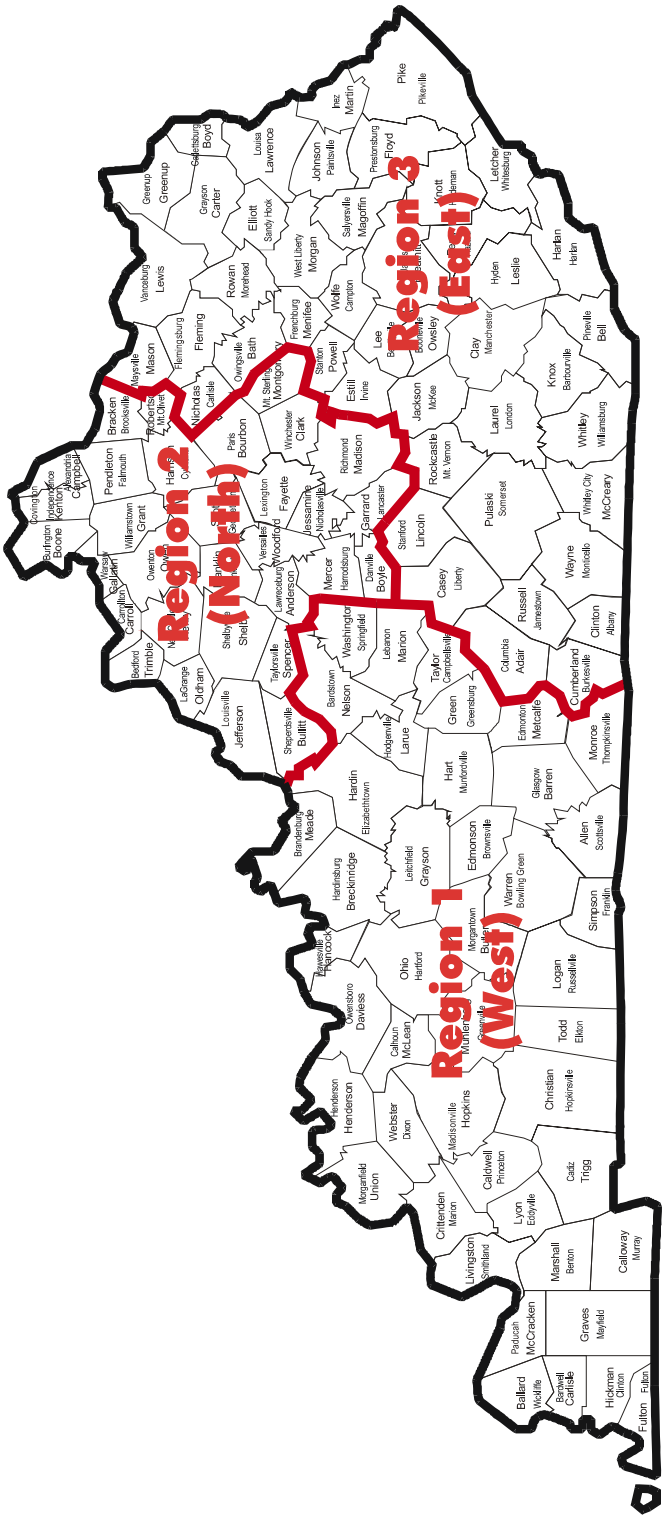

Table 1. SURVEY LOCATIONS

| Site Number | Region | Functional Classification | County | Intersection Description | Nearest Town |
|---|---|---|---|---|---|
| 1 | West | Rural Interstate | Simpson | I-65 at Exit 6 | Franklin |
| 2 | West | Rural Interstate | Christian | I-24 at Exit 73 | Newstead |
| 3 | West | Rural Interstate | Barren | I-65 at Exit 48 | Cave City |
| 4 | West | Rural Interstate | Hardin | I-65 at Exit 81 | Sonora |
| 5 | West | Rural Interstate | Barren | I-65 at Exit 53 | Cave City |
| 6 | West | Rural Interstate | Hardin | I-65 at Exit 102 | Lebanon Junction |
| 7 | West | Rural Interstate | Marshall | I-24 at Exit 27 | Lake City |
| 8 | West | Rural Interstate | Simpson | I-65 at Exit 2 | Franklin |
| 9 | West | Rural Principal Arterial | Hardin | Bluegrass Parkway at I-65 | Elizabethtown |
| 10 | West | Rural Principal Arterial | Marion | US 68 at KY 208 | Lebanon |
| 11 | West | Rural Principal Arterial | Meade | US 31W at KY 1638 | Muldraugh |
| 12 | West | Rural Principal Arterial | Warren | US 231 at KY 622 | Bowling Green |
| 13 | West | Rural Principal Arterial | Hopkins | Western Kentucky Parkway at Exit 24 | Dawson Springs |
| 14 | West | Rural Principal Arterial | Hopkins | Pennyrile Parkway at Exit 33 | Nortonville |
| 15 | West | Rural Principal Arterial | Grayson | Western Kentucky Parkway at Exit 107 | Leitchfield |
| 16 | West | Rural Principal Arterial | Marshall | Purchase Parkway at Exit 47 | Draffenville |
| 17 | West | Rural Principal Arterial | Marshall | US 641 at KY 58 | Benton |
| 18 | West | Rural Principal Arterial | Marshall | US 68 at US 641 | Draffenville |
| 19 | West | Rural Principal Arterial | Graves | US 45 at KY 1276 | Mayfield |
| 20 | West | Rural Principal Arterial | Marshall | US 641 at US 68 | Draffenville |
| 21 | West | Rural Minor Arterial/Major Collector | Barren | US 31W at KY 70 | Cave City |
| 22 | West | Rural Minor Arterial/Major Collector | Marion | KY 426 at US 68/KY 55 | Lebanon |
| 23 | West | Rural Minor Arterial/Major Collector | Barren | US 31W at KY 90 | Cave City |
| 24 | West | Rural Minor Arterial/Major Collector | McCracken | KY 286 at US 62 | Bardwell |
| 25 | West | Rural Minor Arterial/Major Collector | McCracken | KY 305 at KY 358 | Paducah |
| 26 | West | Rural Minor Arterial/Major Collector | Muhlenburg | KY 189 at US 62 | Greenville |
| 27 | West | Rural Minor Arterial/Major Collector | Grayson | KY 259 at US 62 | Leitchfield |
| 28 | West | Rural Minor Arterial/Major Collector | Muhlenburg | US 431 at KY 189 | Central City |
| 29 | West | Rural Minor Arterial/Major Collector | Grayson | KY 259 at W. Lake | Leitchfield |
| 30 | West | Rural Minor Arterial/Major Collector | Breckinridge | KY 79 at KY 259 | Harned |
| 31 | West | Rural Minor Arterial/Major Collector | Grayson | KY 79 at US 62 | Caneyville |
| 32 | West | Rural Minor Arterial/Major Collector | Logan | US 431 at KY 663 | Adairville |
| 33 | West | Rural Minor Collector/Local | Taylor | KY 3183 at KY 55 | Campbellsville |
| 34 | West | Rural Minor Collector/Local | Logan | KY 1038 at KY 103 | Auburn |
| 35 | West | Rural Minor Collector/Local | Henderson | KY 1299 at KY 425 | Henderson |
| 36 | West | Rural Minor Collector/Local | Taylor | KY 527 at KY 3212 | Campbellsville |
| 37 | West | Rural Minor Collector/Local | Logan | US 68 at US 79 | Russellville |
| 38 | West | Rural Minor Collector/Local | Muhlenburg | US 62 at KY 181 | Greenville |
| 39 | West | Rural Minor Collector/Local | Barren | KY 677 at KY 740 | Three Springs |
| 40 | West | Rural Minor Collector/Local | Meade | KY 144 at KY 259 | Rhodelia |
| 41 | West | Urban Interstate/Freeway | Hardin | Western Kentucky Parkway at US 31W | Elizabethtown |
| 42 | West | Urban Interstate/Freeway | Hardin | I-65 at Exit 94 | Elizabethtown |
| 43 | West | Urban Interstate/Freeway | Christian | Pennyrile Parkway at Exit 8 | Hopkinsville |
| 44 | West | Urban Interstate/Freeway | Hopkins | Pennyrile Parkway at Exit 44 | Madisonville |
| 45 | West | Urban Interstate/Freeway | Daviess | US 60B at US 431 | Owensboro |
| 46 | West | Urban Interstate/Freeway | Daviess | William Natcher Parkway at Exit 70 | Owensboro |
| 47 | West | Urban Principal Arterial | McCracken | US 60 at I-24 | Paducah |
| 48 | West | Urban Principal Arterial | Daviess | US 431 at 2nd Street | Owensboro |
| 49 | West | Urban Principal Arterial | Nelson | US 31E at KY 1430 | Bardstown |
| 50 | West | Urban Principal Arterial | Barren | US 31E at US 68 | Glasgow |

Table 1. SURVEY LOCATIONS (continued)

| Site Number | Region | Functional Classification | County | Intersection Description | Nearest Town |
|---|---|---|---|---|---|
| 51 | West | Urban Principal Arterial | McCracken | US 60/62 at Bridge Street | Paducah |
| 52 | West | Urban Principal Arterial | Warren | US 68/80 at KY 880 | Bowling Green |
| 53 | West | Urban Principal Arterial | Warren | US 68/80 at Main Avenue | BowlingGreen |
| 54 | West | Urban Principal Arterial | Henderson | US 41A at 5th St. | Henderson |
| 55 | West | Urban Principal Arterial | Barren | US 31E at KY 90 | Glasgow |
| 56 | West | Urban Principal Arterial | Hardin | US 31W at KY 1600 | Elizabethtown |
| 57 | West | Urban Minor Arterial/Collector/Local | Hardin | KY 3005 at KY 1357 | Elizabethtown |
| 58 | West | Urban Minor Arterial/Collector/Local | Barren | KY 63 at US 31EX | Glasgow |
| 59 | West | Urban Minor Arterial/Collector/Local | McCracken | KY 787 at US 62 | Paducah |
| 60 | West | Urban Minor Arterial/Collector/Local | McCracken | KY 994 at Schneidman Road | Paducah |
| 61 | West | Urban Minor Arterial/Collector/Local | Logan | KY 3233 at US 79 & US 431 Truck Rte. | Russellville |
| 62 | West | Urban Minor Arterial/Collector/Local | Henderson | KY 136 at KY 285 | Henderson |
| 63 | West | Urban Minor Arterial/Collector/Local | Calloway | KY 1327 at 16th Street | Murray |
| 64 | West | Urban Minor Arterial/Collector/Local | McCracken | US 45X (Broadway) at N.13th Street | Paducah |
| 65 | West | Urban Minor Arterial/Collector/Local | McCracken | US 45 at Clay Avenue (6th Street) | Paducah |
| 66 | West | Urban Minor Arterial/Collector/Local | McCracken | KY 994 at US 60/62 | Paducah |
| 67 | North | Rural Interstate | Clark | I-64 at Rest Area | Winchester |
| 68 | North | Rural Interstate | Boone | I-75 at Exit 175 | Richwood |
| 69 | North | Rural Interstate | Oldham | I-71 at Exit 22 | LaGrange |
| 70 | North | Rural Interstate | Montgomery | I-64 at Exit 110 | Mt. Sterling |
| 71 | North | Rural Interstate | Boone | I-75 at Exit 171 | Walton |
| 72 | North | Rural Interstate | Boone | I-275 at Exit 11 | Covington |
| 73 | North | Rural Interstate | Shelby | I-64 at Exit 43 | Waddy |
| 74 | North | Rural Interstate | Franklin | I-64 at Exit 53 | Frankfort |
| 75 | North | Rural Interstate | Bullitt | I-65 at Exit 117 | Shepardsville |
| 76 | North | Rural Interstate | Shelby | I-64 at Exit 28 | Simpsonville |
| 77 | North | Rural Interstate | Scott | I-64 at Exit 69 | Georgetown |
| 78 | North | Rural Interstate | Oldham | I-71 at Exit 14 | Brownsboro |
| 79 | North | Rural Principal Arterial | Boyle | US 150 at US 127 Bypass | Danville |
| 80 | North | Rural Principal Arterial | Woodford | US 60 at US 62 | Versailles |
| 81 | North | Rural Principal Arterial | Scott | US 460 at US 62 | Georgetown |
| 82 | North | Rural Principal Arterial | Woodford | Bluegrass Parkway at Exit 68 | Versailles |
| 83 | North | Rural Principal Arterial | Jessamine | US 27 at US 27X | Nicholasville |
| 84 | North | Rural Principal Arterial | Bullitt | US 31E at KY 44 | Mt.Washington |
| 85 | North | Rural Minor Arterial/Major Collector | Mercer | KY 33 at US 68 | Pleasant Hill |
| 86 | North | Rural Minor Arterial/Major Collector | Oldham | KY 22 at KY 53 | Ballardsville |
| 87 | North | Rural Minor Arterial/Major Collector | Boone | KY 14 at KY 16 | Verona |
| 88 | North | Rural Minor Arterial/Major Collector | Oldham | KY 146 at KY 1817 | Buckner |
| 89 | North | Rural Minor Arterial/Major Collector | Clark | KY 418 at KY 3371 | Winchester |
| 90 | North | Rural Minor Arterial/Major Collector | Kenton | KY 536 at KY 177 | Visalia |
| 91 | North | Rural Minor Arterial/Major Collector | Shelby | KY 44 at KY 53 | Shelbyville |
| 92 | North | Rural Minor Arterial/Major Collector | Grant | KY 467 at KY 22 | Dry Ridge |
| 93 | North | Rural Minor Arterial/Major Collector | Scott | KY 32 at US 25 | Georgetown |
| 94 | North | Rural Minor Arterial/Major Collector | Jefferson | US 60 at Beckley Station Road | Louisville |
| 95 | North | Rural Minor Collector/Local | Montgomery | KY 646 at KY 11 | Camargo |
| 96 | North | Rural Minor Collector/Local | Montgomery | KY 1991 at KY 537 | Mt. Sterling |
| 97 | North | Rural Minor Collector/Local | Boyle | KY 1273 at US 150 | Danville |
| 98 | North | Rural Minor Collector/Local | Franklin | KY 2820 at US 127 | Frankfort |
| 99 | North | Rural Minor Collector/Local | Campbell | KY 735 at KY 9 | Mentor |
| 100 | North | Rural Minor Collector/Local | Jessamine | KY 3433 at KY 29 | Wilmore |

Table 1. SURVEY LOCATIONS (continued)

| Site Number | Region | Functional Classification | County | Intersection Description | Nearest Town |
|---|---|---|---|---|---|
| 101 | North | Urban Interstate/Freeway | Jefferson | I-264 at Exit 4 | Louisville |
| 102 | North | Urban Interstate/Freeway | Jefferson | I-264 at Exit 16 | Louisville |
| 103 | North | Urban Interstate/Freeway | Jefferson | I-64 at Exit 5B | Louisville |
| 104 | North | Urban Interstate/Freeway | Fayette | I-64 at Exit 87 | Lexington |
| 105 | North | Urban Interstate/Freeway | Jefferson | I-265 at Exit 12 | Louisville |
| 106 | North | Urban Interstate/Freeway | Campbell | I-275 at Exit 77 | Wilder |
| 107 | North | Urban Interstate/Freeway | Fayette | I-75 at Exit 104 | Lexington |
| 108 | North | Urban Interstate/Freeway | Jefferson | I-265 at Exit 27 | Louisville |
| 109 | North | Urban Interstate/Freeway | Boone | I-75 at Exit 180 | Erlanger |
| 110 | North | Urban Interstate/Freeway | Kenton | I-75 at Exit 186 | Crescent Springs |
| 111 | North | Urban Interstate/Freeway | Jefferson | I-64 at Exit 17 | Louisville |
| 112 | North | Urban Interstate/Freeway | Clark | I-64 at Exit 96 | Winchester |
| 113 | North | Urban Interstate/Freeway | Fayette | I-75 at Exit 108 | Lexington |
| 114 | North | Urban Interstate/Freeway | Campbell | I-471 at Exit 2 | Ft. Thomas |
| 115 | North | Urban Interstate/Freeway | Jefferson | I-264 at Exit 22 | Louisville |
| 116 | North | Urban Interstate/Freeway | Kenton | I-275 at Exit 83 | Erlanger |
| 117 | North | Urban Interstate/Freeway | Jefferson | I-65 at Exit 127 | Louisville |
| 118 | North | Urban Interstate/Freeway | Kenton | I-75 at Exit 184 | Erlanger |
| 119 | North | Urban Interstate/Freeway | Boone | I-275 at Exit 7 | Hebron |
| 120 | North | Urban Interstate/Freeway | Jefferson | I-264 at Exit 5 | Louisville |
| 121 | North | Urban Principal Arterial | Jefferson | US 31W at KY 841 | Louisville |
| 122 | North | Urban Principal Arterial | Jefferson | US 31E at First Street | Louisville |
| 123 | North | Urban Principal Arterial | Fayette | Euclid Ave. at Upper Street (US 27) | Lexington |
| 124 | North | Urban Principal Arterial | Campbell | US 27 at KY 8 (4th Street) | Newport |
| 125 | North | Urban Principal Arterial | Scott | US 460 B at US 460 | Georgetown |
| 126 | North | Urban Principal Arterial | Fayette | US 68 at Ft. Harrod Drive | Lexington |
| 127 | North | Urban Principal Arterial | Jefferson | US 150 at 18th Street | Louisville |
| 128 | North | Urban Principal Arterial | Jefferson | KY 1934 at KY 2051 | Louisville |
| 129 | North | Urban Principal Arterial | Jefferson | US 31E at Tyler Lane | Louisville |
| 130 | North | Urban Principal Arterial | Jefferson | US 31W at Garrs Lane | Louisville |
| 131 | North | Urban Principal Arterial | Jefferson | US 31W at Ashby Lane | Louisville |
| 132 | North | Urban Principal Arterial | Jefferson | US 150 at Clay Avenue | Louisville |
| 133 | North | Urban Principal Arterial | Kenton | KY 16 at West 34th Street | Covington |
| 134 | North | Urban Principal Arterial | Campbell | KY 1120 at US 27 | Newport |
| 135 | North | Urban Minor Arterial/Collector/Local | Woodford | US 60X at US 60 | Versailles |
| 136 | North | Urban Minor Arterial/Collector/Local | Jefferson | KY 1020 at I-264 | Louisville |
| 137 | North | Urban Minor Arterial/Collector/Local | Boone | KY 237 at KY 18 | Burlington |
| 138 | North | Urban Minor Arterial/Collector/Local | Scott | US 62 at US 460 | Georgetown |
| 139 | North | Urban Minor Arterial/Collector/Local | Bullitt | US 31EX at KY 44 | Mt. Washington |
| 140 | North | Urban Minor Arterial/Collector/Local | Kenton | KY 17 at KY 16 | Latonia |
| 141 | North | Urban Minor Arterial/Collector/Local | Jessamine | US 27X at Orchard Drive | Nicholasville |
| 142 | North | Urban Minor Arterial/Collector/Local | Jefferson | KY 864 at Breckinridge Street | Louisville |
| 143 | North | Urban Minor Arterial/Collector/Local | Boone | KY 3076 at Minola Pike | Florence |
| 144 | North | Urban Minor Arterial/Collector/Local | Boone | US 42 at US 25 | Florence |
| 145 | North | Urban Minor Arterial/Collector/Local | Scott | KY 620 at US 25 | Georgetown |
| 146 | North | Urban Minor Arterial/Collector/Local | Scott | KY 2906 at US 460 | Georgetown |
| 147 | North | Urban Minor Arterial/Collector/Local | Kenton | KY 3070 at KY 16 | Independence |
| 148 | North | Urban Minor Arterial/Collector/Local | Clark | US 60 at KY 89 | Winchester |
| 149 | East | Rural Interstate | Whitley | I-75 at Exit 25 | Williamsburg |
| 150 | East | Rural Interstate | Rockcastle | I-75 at Exit 62 | Mt. Vernon |

Table 1. SURVEY LOCATIONS (continued)

| Site Number | Region | Functional Classification | County | Intersection Description | Nearest Town |
|---|---|---|---|---|---|
| 151 | East | Rural Interstate | Carter | I-64 at Exit 156 | Olive Hill |
| 152 | East | Rural Interstate | Carter | I-64 at Exit 172 | Grayson |
| 153 | East | Rural Interstate | Boyd | I-64 at Exit 181 | Ashland |
| 154 | East | Rural Interstate | Boyd | I-64 at Exit 185 | Ashland |
| 155 | East | Rural Principal Arterial | Letcher | US 119 at KY 15 | Whitesburg |
| 156 | East | Rural Principal Arterial | Bell | US 25E at KY 66 | Pineville |
| 157 | East | Rural Principal Arterial | Greenup | KY 8 at US 23 Truck Route | South Portsmouth |
| 158 | East | Rural Principal Arterial | Breathitt | KY 15 at KY 30 | Jackson |
| 159 | East | Rural Principal Arterial | Harlan | US 421 at KY 72 | Harlan |
| 160 | East | Rural Principal Arterial | Martin | KY 645 at KY 40 | Inez |
| 161 | East | Rural Principal Arterial | Pike | US 460 at KY 1460 | Pikeville |
| 162 | East | Rural Principal Arterial | Letcher | KY 15 at KY 15X | Whitesburg |
| 163 | East | Rural Principal Arterial | Harlan | US 119 at US 421 | Harlan |
| 164 | East | Rural Principal Arterial | Knox | US 25E at KY 225/3439 | Barbourville |
| 165 | East | Rural Principal Arterial | Harlan | US 119 at KY 2179 | Cumberland |
| 166 | East | Rural Principal Arterial | Lincoln | US 27 at US 150 | Stanford |
| 167 | East | Rural Minor Arterial/Major Collector | Greenup | KY 2 at US 23 | Greenup |
| 168 | East | Rural Minor Arterial/Major Collector | Johnson | KY 172 at KY 40 | Staffordsville |
| 169 | East | Rural Minor Arterial/Major Collector | Carter | KY 174 at US 60 | Olive Hill |
| 170 | East | Rural Minor Arterial/Major Collector | Bell | KY 190 at US 25E | Pineville |
| 171 | East | Rural Minor Arterial/Major Collector | Letcher | KY 7 at KY 931 | Isom |
| 172 | East | Rural Minor Arterial/Major Collector | Letcher | KY 317 at KY 7 | Whitesburg |
| 173 | East | Rural Minor Arterial/Major Collector | Breathitt | KY 476 at KY 15 | Jackson |
| 174 | East | Rural Minor Arterial/Major Collector | Carter | US 60 at KY 7 | Grayson |
| 175 | East | Rural Minor Arterial/Major Collector | Lincoln | KY 618 at KY 39 | Crab Orchard |
| 176 | East | Rural Minor Arterial/Major Collector | Pulaski | KY 80 at KY 837 | Nancy |
| 177 | East | Rural Minor Arterial/Major Collector | Floyd | KY 1426 at KY 979 | Harold |
| 178 | East | Rural Minor Arterial/Major Collector | Laurel | KY 1193 at KY 192 | Baldrock |
| 179 | East | Rural Minor Collector/Local | Johnson | KY 689 at KY 172 | Paintsville |
| 180 | East | Rural Minor Collector/Local | Floyd | KY 680 at KY 122 | McDowell |
| 181 | East | Rural Minor Collector/Local | Whitley | KY 1481 at 204 | Williamsburg |
| 182 | East | Rural Minor Collector/Local | Johnson | KY 1107 at KY 302 | Van Lear |
| 183 | East | Rural Minor Collector/Local | Whitley | KY 1595 at KY 92 | Siler |
| 184 | East | Rural Minor Collector/Local | Adair | KY 531 at KY 80 | Columbia |
| 185 | East | Rural Minor Collector/Local | Clay | KY 638 at US 421 | Manchester |
| 186 | East | Rural Minor Collector/Local | Laurel | KY 1006 at KY 192 | London |
| 187 | East | Urban Interstate/Freeway | Laurel | I-75 at Exit 38 | London |
| 188 | East | Urban Interstate/Freeway | Rowan | I-64 at Exit 137 | Morehead |
| 189 | East | Urban Principal Arterial | Perry | KY 15 at KY 15X | Hazard |
| 190 | East | Urban Principal Arterial | Greenup | US 23 at KY 693 | Flatwoods |
| 191 | East | Urban Principal Arterial | Laurel | US 25E at I-75 | Corbin |
| 192 | East | Urban Principal Arterial | Boyd | US 23 at Mall Road | Ashland |
| 193 | East | Urban Principal Arterial | Boyd | US 23 at US 60 | Ashland |
| 194 | East | Urban Principal Arterial | Laurel | US 25E at US 25 | Corbin |
| 195 | East | Urban Minor Arterial/Collector/Local | Perry | KY 451 at KY 15X | Hazard |
| 196 | East | Urban Minor Arterial/Collector/Local | Pike | KY 1460 at KY 1426 | Pikeville |
| 197 | East | Urban Minor Arterial/Collector/Local | Laurel | US 25 at KY 80 | London |
| 198 | East | Urban Minor Arterial/Collector/Local | Greenup | KY 750 at KY 207 | Flatwoods |
| 199 | East | Urban Minor Arterial/Collector/Local | Whitley | US 25W at KY 296 | Williamsburg |
| 200 | East | Urban Minor Arterial/Collector/Local | Pulaski | KY 80 at KY 2296 | Somerset |

TABLE 2. USAGE RATE FOR ALL FRONT SEAT OCCUPANTS

| | PERCENT USAGE | | | |
|---|---|---|---|---|
| | REGION | | | |
| FUNCTIONAL CLASSIFICATION | WEST | NORTH | EAST | ALL |
| Rural Interstate | 80.9 | 80.9 | 78.9 | 80.5 |
| Rural Principal Arterial | 75.9 | 78.7 | 59.1 | 68.6 |
| Rural Minor Arterial/Major Collector | 64.0 | 71.2 | 59.8 | 64.2 |
| Rural Minor Collector/Local | 63.1 | 62.8 | 62.0 | 62.6 |
| Urban Interstate/Freeway | 80.6 | 79.8 | 85.6 | 80.0 |
| Urban Principal Arterial | 70.6 | 70.6 | 62.1 | 69.5 |
| Urban Minor Arterial/Collector/Local | 67.7 | 73.8 | 61.1 | 70.7 |
| All | 71.0 | 76.2 | 62.8 | 71.8 |

TABLE 3. USAGE RATE FOR DRIVERS

| | PERCENT USAGE | | | |
|---|---|---|---|---|
| | REGION | | | |
| FUNCTIONAL CLASSIFICATION | WEST | NORTH | EAST | ALL |
| Rural Interstate | 78.9 | 80.6 | 78.1 | 79.8 |
| Rural Principal Arterial | 75.4 | 77.7 | 59.2 | 68.4 |
| Rural Minor Arterial/Major Collector | 64.9 | 71.2 | 60.3 | 64.8 |
| Rural Minor Collector/Local | 63.9 | 62.9 | 61.5 | 62.8 |
| Urban Interstate/Freeway | 80.9 | 80.2 | 85.8 | 80.4 |
| Urban Principal Arterial | 69.9 | 71.5 | 62.6 | 69.9 |
| Urban Minor Arterial/Collector/Local | 67.8 | 74.2 | 60.8 | 70.9 |
| All | 70.9 | 76.5 | 62.9 | 71.9 |

TABLE 4. USAGE RATE FOR ALL FRONT SEAT PASSENGERS

| | PERCENT USAGE | | | |
|---|---|---|---|---|
| | REGION | | | |
| FUNCTIONAL CLASSIFICATION | WEST | NORTH | EAST | ALL |
| Rural Interstate | 86.5 | 81.2 | 81.0 | 82.5 |
| Rural Principal Arterial | 77.5 | 81.5 | 58.6 | 69.5 |
| Rural Minor Arterial/Major Collector | 61.0 | 70.5 | 58.7 | 62.4 |
| Rural Minor Collector/Local | 60.0 | 62.2 | 63.9 | 62.0 |
| Urban Interstate/Freeway | 79.0 | 78.4 | 84.6 | 78.6 |
| Urban Principal Arterial | 73.9 | 67.4 | 61.0 | 68.2 |
| Urban Minor Arterial/Collector/Local | 66.9 | 72.1 | 61.3 | 69.4 |
| All | 71.1 | 75.0 | 62.8 | 71.2 |

TABLE 5. USAGE RATE FOR CHILDREN UNDER FOUR YEARS OF AGE (FRONT AND REAR)

| | PERCENT USAGE | | | |
|---|---|---|---|---|
| | REGION | | | |
| FUNCTIONAL CLASSIFICATION | WEST | NORTH | EAST | ALL |
| Rural Interstate | 100.0 | 100.0 | 100.0 | 100.0 |
| Rural Principal Arterial | 99.8 | 100.0 | 93.8 | 97.1 |
| Rural Minor Arterial/Major Collector | 94.2 | 98.3 | 99.9 | 97.2 |
| Rural Minor Collector/Local | 100.0 | 100.0 | 94.7 | 97.8 |
| Urban Interstate/Freeway | 100.0 | 99.0 | 100.0 | 99.1 |
| Urban Principal Arterial | 99.8 | 98.2 | 97.8 | 98.5 |
| Urban Minor Arterial/Collector/Local | 100.0 | 99.5 | 100.0 | 99.7 |
| All | 98.5 | 99.1 | 97.1 | 98.5 |

TABLE 6. TREND IN STATEWIDE USAGE RATES

| YEAR | PERCENT USING SAFETY BELTS | | |
|---|---|---|---|
| | ALL FRONT SEAT OCCUPANTS | DRIVERS | CHILDREN UNDER FOUR YEARS OF AGE* |
| 1982 | ** | 4 | 15 |
| 1983 | ** | 6 | 24 |
| 1984 | ** | 7 | 30 |
| 1985 | 9 | 9 | 29 |
| 1986 | 13 | 13 | 30 |
| 1988 | 20 | 21 | 48 |
| 1989 | 25 | 26 | 49 |
| 1990 | 33 | 32 | 57 |
| 1991 | 39 | 39 | 57 |
| 1992 | 40 | 41 | 62 |
| 1993 | 42 | 42 | 61 |
| 1994 | 58 | 58 | 72 |
| 1995 | 54 | 54 | 66 |
| 1996 | 55 | 55 | 79 |
| 1997 | 54 | 54 | 82 |
| 1998 | 54 | 54 | 80 |
| 1999 | 59 | 59 | 89 |
| 2000 | 60 | 60 | 87 |
| 2001 | 62 | 62 | 89 |
| 2002 | 62 | 62 | 93 |
| 2003 | 66 | 65 | 95 |
| 2004 | 66 | 66 | 96 |
| 2005 | 67 | 67 | 94 |
| 2006 | 67 | 68 | 94 |
| 2007 | 72 | 72 | 98 |

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

**Data not available.

TABLE 7. USAGE RATE BY TYPE OF VEHICLE (ALL FRONT SEAT OCCUPANTS)

| FUNCTIONAL CLASSIFICATION | REGION | | | |
|---|---|---|---|---|
| | WEST | NORTH | EAST | ALL |
| **Passengers Cars** | | | | |
| Rural Interstate | 81.5 | 82.9 | 77.7 | 81.7 |
| Rural Principal Arterial | 79.3 | 81.8 | 61.7 | 71.7 |
| Rural Minor Arterial/Major Collector | 67.7 | 73.3 | 66.3 | 68.6 |
| Rural Minor Collector/Local | 66.4 | 65.4 | 65.3 | 65.8 |
| Urban Interstate/Freeway | 83.4 | 82.1 | 87.8 | 82.4 |
| Urban Principal Arterial | 75.2 | 72.9 | 64.6 | 72.4 |
| Urban Minor Arterial/Collector/Local | 71.1 | 76.5 | 62.8 | 73.4 |
| All | 74.2 | 78.6 | 66.1 | 74.6 |
| **Pickup Trucks** | | | | |
| Rural Interstate | 67.4 | 66.2 | 71.8 | 67.5 |
| Rural Principal Arterial | 62.8 | 68.4 | 48.8 | 57.2 |
| Rural Minor Arterial/Major Collector | 55.2 | 59.1 | 49.1 | 54.0 |
| Rural Minor Collector/Local | 49.9 | 55.6 | 49.0 | 50.6 |
| Urban Interstate/Freeway | 69.2 | 68.2 | 69.0 | 68.3 |
| Urban Principal Arterial | 55.7 | 58.0 | 51.4 | 56.6 |
| Urban Minor Arterial/Collector/Local | 56.0 | 63.3 | 54.3 | 60.3 |
| All | 58.9 | 64.2 | 52.5 | 60.1 |
| **Vans** | | | | |
| Rural Interstate | 91.1 | 88.1 | 86.6 | 88.6 |
| Rural Principal Arterial | 84.0 | 83.7 | 70.7 | 77.9 |
| Rural Minor Arterial/Major Collector | 72.0 | 80.0 | 68.7 | 72.8 |
| Rural Minor Collector/Local | 73.7 | 66.3 | 69.9 | 70.8 |
| Urban Interstate/Freeway | 85.3 | 82.2 | 87.5 | 82.6 |
| Urban Principal Arterial | 78.9 | 73.5 | 64.1 | 73.5 |
| Urban Minor Arterial/Collector/Local | 72.8 | 80.6 | 60.0 | 76.1 |
| All | 79.0 | 80.8 | 70.9 | 78.1 |
| **Sport Utility Vehicles** | | | | |
| Rural Interstate | 85.6 | 87.0 | 84.1 | 86.2 |
| Rural Principal Arterial | 81.3 | 79.3 | 63.9 | 73.2 |
| Rural Minor Arterial/Major Collector | 68.1 | 76.5 | 66.8 | 69.6 |
| Rural Minor Collector/Local | 69.1 | 64.4 | 69.2 | 68.3 |
| Urban Interstate/Freeway | 86.7 | 83.4 | 93.4 | 84.0 |
| Urban Principal Arterial | 75.2 | 74.0 | 68.0 | 73.5 |
| Urban Minor Arterial/Collector/Local | 72.8 | 75.4 | 66.0 | 73.6 |
| All | 76.0 | 79.9 | 68.8 | 76.3 |

# APPENDIX A

## COUNTY POPULATIONS AND NUMBER OF DATA COLLECTION SITES

| COUNTY | POPULATION* | NUMBER OF SITES | REGION** |
|---|---|---|---|
| Adair | 17,244 | 1 | 3 |
| Allen | 17,800 | 0 | 1 |
| Anderson | 19,111 | 0 | 2 |
| Ballard | 8,286 | 0 | 1 |
| Barren | 38,033 | 8 | 1 |
| Bath | 11,085 | 0 | 3 |
| Bell | 30,060 | 2 | 3 |
| Boone | 85,991 | 9 | 2 |
| Bourbon | 19,360 | 0 | 2 |
| Boyd | 49,752 | 4 | 3 |
| Boyle | 27,697 | 2 | 2 |
| Bracken | 8,279 | 0 | 2 |
| Breathitt | 16,100 | 2 | 3 |
| Breckinridge | 18,648 | 1 | 1 |
| Bullitt | 61,236 | 3 | 2 |
| Butler | 13,010 | 0 | 1 |
| Caldwell | 13,060 | 0 | 1 |
| Calloway | 34,177 | 1 | 1 |
| Campbell | 88,616 | 5 | 2 |
| Carlisle | 5,351 | 0 | 1 |
| Carroll | 10,155 | 0 | 2 |
| Carter | 26,889 | 4 | 3 |
| Casey | 15,447 | 0 | 3 |
| Christian | 72,265 | 2 | 1 |
| Clark | 33,144 | 4 | 2 |
| Clay | 24,556 | 1 | 3 |
| Clinton | 9,634 | 0 | 3 |
| Crittenden | 9,384 | 0 | 1 |
| Cumberland | 7,147 | 0 | 3 |
| Daviess | 91,545 | 3 | 1 |
| Edmonson | 11,644 | 0 | 1 |
| Elliott | 6,748 | 0 | 3 |
| Estill | 15,307 | 0 | 3 |
| Fayette | 260,512 | 5 | 2 |
| Fleming | 13,792 | 0 | 3 |
| Floyd | 42,441 | 2 | 3 |
| Franklin | 47,687 | 2 | 2 |
| Fulton | 7,752 | 0 | 1 |
| Gallatin | 7,870 | 0 | 2 |
| Garrard | 14,792 | 0 | 2 |
| Grant | 22,384 | 1 | 2 |

| COUNTY | POPULATION* | NUMBER OF SITES | REGION** |
|---|---|---|---|
| Graves | 37,028 | 1 | 1 |
| Grayson | 24,053 | 4 | 1 |
| Green | 11,518 | 0 | 1 |
| Greenup | 36,891 | 4 | 3 |
| Hancock | 8,392 | 0 | 1 |
| Hardin | 94,174 | 7 | 1 |
| Harlan | 33,202 | 3 | 3 |
| Harrison | 17,983 | 0 | 2 |
| Hart | 17,445 | 0 | 1 |
| Henderson | 44,829 | 3 | 1 |
| Henry | 15,060 | 0 | 2 |
| Hickman | 5,262 | 0 | 1 |
| Hopkins | 46,519 | 3 | 1 |
| Jackson | 13,495 | 0 | 3 |
| Jefferson | 693,604 | 20 | 2 |
| Jessamine | 39,041 | 3 | 2 |
| Johnson | 23,445 | 3 | 3 |
| Kenton | 151,464 | 7 | 2 |
| Knott | 17,649 | 0 | 3 |
| Knox | 31,795 | 1 | 3 |
| Larue | 13,373 | 0 | 1 |
| Laurel | 52,715 | 6 | 3 |
| Lawrence | 15,569 | 0 | 3 |
| Lee | 7,916 | 0 | 3 |
| Leslie | 12,401 | 0 | 3 |
| Letcher | 25,277 | 4 | 3 |
| Lewis | 14,092 | 0 | 3 |
| Lincoln | 23,361 | 2 | 3 |
| Livingston | 9,804 | 0 | 1 |
| Logan | 26,573 | 4 | 1 |
| Lyon | 8,080 | 0 | 1 |
| McCracken | 65,514 | 9 | 1 |
| McCreary | 17,080 | 0 | 3 |
| McLean | 9,938 | 0 | 1 |
| Madison | 70,872 | 0 | 2 |
| Magoffin | 13,332 | 0 | 3 |
| Marion | 18,212 | 2 | 1 |
| Marshall | 30,125 | 5 | 1 |
| Martin | 12,578 | 1 | 3 |
| Mason | 16,800 | 0 | 3 |
| Meade | 26,349 | 2 | 1 |

| COUNTY | POPULATION* | NUMBER OF SITES | REGION** |
|---|---|---|---|
| Menifee | 6,556 | 0 | 3 |
| Mercer | 20,817 | 1 | 2 |
| Metcalfe | 10,037 | 0 | 1 |
| Monroe | 11,756 | 0 | 1 |
| Montgomery | 22,554 | 3 | 2 |
| Morgan | 13,948 | 0 | 3 |
| Muhlenberg | 31,839 | 3 | 1 |
| Nelson | 37,477 | 1 | 1 |
| Nicholas | 6,813 | 0 | 3 |
| Ohio | 22,916 | 0 | 1 |
| Oldham | 46,178 | 4 | 2 |
| Owen | 10,547 | 0 | 2 |
| Owsley | 4,858 | 0 | 3 |
| Pendelton | 14,390 | 0 | 2 |
| Perry | 29,390 | 2 | 3 |
| Pike | 68,736 | 2 | 3 |
| Powell | 13,237 | 0 | 3 |
| Pulaski | 56,217 | 2 | 3 |
| Robertson | 2,266 | 0 | 2 |
| Rockcastle | 16,582 | 1 | 3 |
| Rowan | 22,094 | 1 | 3 |
| Russell | 16,315 | 0 | 3 |
| Scott | 33,061 | 7 | 2 |
| Shelby | 33,337 | 3 | 2 |
| Simpson | 16,405 | 2 | 1 |
| Spencer | 11,766 | 0 | 2 |
| Taylor | 22,927 | 2 | 1 |
| Todd | 11,971 | 0 | 1 |
| Trigg | 12,597 | 0 | 1 |
| Trimble | 8,125 | 0 | 2 |
| Union | 15,637 | 0 | 1 |
| Warren | 92,522 | 3 | 1 |
| Washington | 10,916 | 0 | 1 |
| Wayne | 19,923 | 0 | 3 |
| Webster | 14,120 | 0 | 1 |
| Whitley | 35,865 | 4 | 3 |
| Wolfe | 7,065 | 0 | 3 |
| Woodford | 23,208 | 3 | 2 |
| TOTALS | 4,041,769 | 200 | |

* Based on 2000 census.
** Region 1 - West; Region 2 - North; Region 3 - East

# APPENDIX B

## RELATIVE ERROR AND CONFIDENCE INTERVAL FOR USAGE FOR ALL FRONT SEAT PASSENGERS

TABLE B-1. RELATIVE ERROR FOR DATA FOR ALL FRONT SEAT OCCUPANTS

| | RELATIVE ERROR* | | | |
|---|---|---|---|---|
| | REGION | | | |
| FUNCTIONAL CLASSIFICATION | WEST | NORTH | EAST | ALL |
| Rural Interstate | 2.7 | 1.7 | 2.9 | 0.9 |
| Rural Principal Arterial | 1.9 | 3.3 | 2.6 | 1.0 |
| Rural Minor Arterial/Major Collector | 3.8 | 3.4 | 4.3 | 1.3 |
| Rural Minor Collector/Local | 3.7 | 5.3 | 3.9 | 2.0 |
| Urban Interstate/Freeway | 1.8 | 1.1 | 2.5 | 0.8 |
| Urban Principal Arterial | 2.6 | 1.5 | 2.7 | 0.9 |
| Urban Minor Arterial/Collector/Local | 2.6 | 2.0 | 3.2 | 1.0 |
| All | 0.7 | 0.5 | 1.1 | 0.4 |

* Percent (0.95 probability)

TABLE B-2. CONFIDENCE INTERVAL FOR DATA FOR ALL FRONT SEAT OCCUPANTS

| | CONFIDENCE INTERVAL* | | | |
|---|---|---|---|---|
| | REGION | | | |
| FUNCTIONAL CLASSIFICATION | WEST | NORTH | EAST | ALL |
| Rural Interstate | 2.2 | 1.4 | 2.3 | 0.7 |
| Rural Principal Arterial | 1.4 | 2.6 | 1.5 | 0.7 |
| Rural Minor Arterial/Major Collector | 2.4 | 2.4 | 2.6 | 0.9 |
| Rural Minor Collector/Local | 2.4 | 3.3 | 2.4 | 1.2 |
| Urban Interstate/Freeway | 1.4 | 0.9 | 2.2 | 0.6 |
| Urban Principal Arterial | 1.8 | 1.0 | 1.7 | 0.6 |
| Urban Minor Arterial/Collector/Local | 1.8 | 1.5 | 2.0 | 0.7 |
| All | 0.5 | 0.4 | 0.7 | 0.3 |

* Percentage with 0.95 probability.

# APPENDIX C

# SUMMARY OF DATA

**TABLE C-1. SUMMARY OF DATA**

| | ALL FRONT SEAT OCCUPANTS | | | | CATEGORY | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | DRIVERS | | FRONT SEAT PASSENGERS | | UNDER FOUR (FRONT AND REAR) | |
| Location Number | Sample | Percent Usage | Relative Error* | Confidence Interval* | Sample | Percent Usage | Sample | Percent Usage | Sample | Percent Usage |
| 1 | 455 | 81 | 4.5 | 3.6 | 342 | 81 | 113 | 79 | 2 | 100 |
| 2 | 105 | 79 | 9.8 | 7.8 | 78 | 74 | 27 | 93 | 1 | 100 |
| 3 | 272 | 83 | 5.4 | 4.5 | 198 | 81 | 74 | 88 | 2 | 100 |
| 4 | 424 | 81 | 4.7 | 3.8 | 312 | 79 | 112 | 87 | 2 | 100 |
| 5 | 643 | 81 | 3.7 | 3.0 | 463 | 81 | 180 | 82 | 9 | 100 |
| 6 | 569 | 82 | 3.9 | 3.2 | 428 | 80 | 141 | 87 | 2 | 100 |
| 7 | 397 | 81 | 4.8 | 3.9 | 290 | 80 | 107 | 82 | 3 | 100 |
| 8 | 422 | 82 | 4.4 | 3.6 | 289 | 81 | 133 | 84 | 6 | 100 |
| 9 | 225 | 81 | 6.3 | 5.1 | 173 | 80 | 52 | 87 | 1 | 100 |
| 10 | 809 | 61 | 5.5 | 3.4 | 628 | 61 | 181 | 59 | 2 | 100 |
| 11 | 818 | 72 | 4.3 | 3.1 | 643 | 71 | 175 | 74 | 10 | 100 |
| 12 | 911 | 69 | 4.3 | 3.0 | 747 | 69 | 164 | 73 | 22 | 100 |
| 13 | 320 | 83 | 5.0 | 4.1 | 275 | 82 | 45 | 87 | 2 | 100 |
| 14 | 351 | 79 | 5.4 | 4.2 | 278 | 80 | 73 | 77 | 0 | N/A |
| 15 | 471 | 83 | 4.1 | 3.4 | 415 | 83 | 56 | 82 | 2 | 100 |
| 16 | 507 | 74 | 5.2 | 3.8 | 397 | 73 | 110 | 75 | 0 | N/A |
| 17 | 562 | 70 | 5.4 | 3.8 | 422 | 71 | 140 | 67 | 10 | 90 |
| 18 | 749 | 69 | 4.8 | 3.3 | 574 | 71 | 175 | 65 | 14 | 93 |
| 19 | 729 | 75 | 4.2 | 3.1 | 553 | 73 | 176 | 81 | 2 | 100 |
| 20 | 619 | 66 | 5.7 | 3.7 | 472 | 67 | 147 | 62 | 0 | N/A |
| 21 | 535 | 58 | 7.2 | 4.2 | 388 | 59 | 147 | 56 | 9 | 89 |
| 22 | 476 | 59 | 7.5 | 4.4 | 361 | 60 | 115 | 55 | 2 | 100 |
| 23 | 620 | 69 | 5.3 | 3.6 | 477 | 69 | 143 | 69 | 8 | 100 |
| 24 | 157 | 69 | 10.4 | 7.2 | 125 | 70 | 32 | 66 | 2 | 100 |
| 25 | 294 | 62 | 9.0 | 5.6 | 219 | 67 | 75 | 47 | 6 | 100 |
| 26 | 450 | 62 | 7.2 | 4.5 | 362 | 62 | 88 | 60 | 8 | 88 |
| 27 | 1,137 | 64 | 4.4 | 2.8 | 901 | 64 | 236 | 61 | 17 | 100 |
| 28 | 442 | 70 | 6.1 | 4.3 | 359 | 69 | 83 | 71 | 6 | 100 |
| 29 | 1,081 | 64 | 4.5 | 2.9 | 836 | 64 | 245 | 63 | 8 | 100 |
| 30 | 411 | 58 | 8.2 | 4.8 | 315 | 58 | 96 | 57 | 6 | 100 |
| 31 | 325 | 60 | 8.8 | 5.3 | 230 | 63 | 95 | 55 | 5 | 100 |
| 32 | 238 | 67 | 9.0 | 6.0 | 187 | 68 | 51 | 63 | 5 | 100 |
| 33 | 782 | 62 | 5.5 | 3.4 | 560 | 61 | 222 | 63 | 1 | 100 |
| 34 | 54 | 54 | 24.8 | 13.3 | 45 | 51 | 9 | 67 | 0 | N/A |
| 35 | 73 | 58 | 19.7 | 11.3 | 59 | 59 | 14 | 50 | 2 | 100 |
| 36 | 370 | 72 | 6.4 | 4.6 | 306 | 74 | 64 | 61 | 8 | 100 |
| 37 | 848 | 67 | 4.7 | 3.2 | 629 | 67 | 219 | 66 | 6 | 100 |
| 38 | 678 | 61 | 6.0 | 3.7 | 538 | 62 | 140 | 57 | 9 | 100 |
| 39 | 79 | 63 | 16.8 | 10.6 | 61 | 61 | 18 | 72 | 0 | N/A |
| 40 | 67 | 57 | 20.9 | 11.9 | 48 | 58 | 19 | 53 | 1 | 100 |
| 41 | 504 | 82 | 4.1 | 3.4 | 360 | 81 | 144 | 83 | 3 | 100 |
| 42 | 633 | 84 | 3.4 | 2.9 | 472 | 82 | 161 | 88 | 2 | 100 |
| 43 | 381 | 73 | 6.1 | 4.4 | 309 | 73 | 72 | 74 | 5 | 100 |
| 44 | 928 | 83 | 2.9 | 2.4 | 775 | 83 | 153 | 83 | 5 | 100 |
| 45 | 843 | 78 | 3.6 | 2.8 | 668 | 80 | 175 | 72 | 7 | 100 |
| 46 | 199 | 81 | 6.6 | 5.4 | 138 | 83 | 61 | 79 | 0 | N/A |
| 47 | 1,330 | 79 | 2.8 | 2.2 | 976 | 79 | 354 | 79 | 6 | 100 |
| 48 | 425 | 68 | 6.5 | 4.4 | 327 | 70 | 98 | 61 | 5 | 80 |
| 49 | 1,075 | 74 | 3.5 | 2.6 | 843 | 74 | 232 | 74 | 8 | 100 |
| 50 | 940 | 72 | 4.0 | 2.9 | 640 | 73 | 300 | 68 | 3 | 100 |

**TABLE C-1. SUMMARY OF DATA (continued)**

| | ALL FRONT SEAT OCCUPANTS | | | | CATEGORY | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | DRIVERS | | FRONT SEAT PASSENGERS | | UNDER FOUR (FRONT AND REAR) | |
| Location Number | Sample | Percent Usage | Relative Error* | Confidence Interval* | Sample | Percent Usage | Sample | Percent Usage | Sample | Percent Usage |
| 51 | 941 | 69 | 4.3 | 3.0 | 722 | 69 | 219 | 68 | 3 | 100 |
| 52 | 580 | 64 | 6.0 | 3.9 | 477 | 65 | 103 | 60 | 2 | 100 |
| 53 | 1,118 | 71 | 3.7 | 2.7 | 840 | 72 | 278 | 69 | 8 | 100 |
| 54 | 1,041 | 69 | 4.1 | 2.8 | 845 | 68 | 196 | 74 | 4 | 100 |
| 55 | 893 | 72 | 4.1 | 2.9 | 582 | 73 | 311 | 69 | 3 | 100 |
| 56 | 900 | 78 | 3.5 | 2.7 | 675 | 76 | 225 | 83 | 2 | 100 |
| 57 | 876 | 72 | 4.1 | 3.0 | 681 | 72 | 195 | 73 | 17 | 100 |
| 58 | 456 | 64 | 6.8 | 4.4 | 326 | 65 | 130 | 63 | 2 | 100 |
| 59 | 97 | 64 | 14.9 | 9.6 | 74 | 66 | 23 | 57 | 1 | 100 |
| 60 | 481 | 64 | 6.8 | 4.3 | 384 | 65 | 97 | 58 | 4 | 100 |
| 61 | 330 | 63 | 8.3 | 5.2 | 239 | 61 | 91 | 67 | 2 | 100 |
| 62 | 409 | 58 | 8.3 | 4.8 | 336 | 59 | 73 | 55 | 5 | 100 |
| 63 | 528 | 68 | 5.9 | 4.0 | 427 | 69 | 101 | 61 | 2 | 100 |
| 64 | 363 | 74 | 6.1 | 4.5 | 279 | 73 | 84 | 76 | 3 | 100 |
| 65 | 460 | 65 | 6.8 | 4.4 | 358 | 66 | 102 | 58 | 2 | 100 |
| 66 | 442 | 66 | 6.7 | 4.4 | 349 | 67 | 93 | 60 | 7 | 100 |
| 67 | 581 | 80 | 4.0 | 3.2 | 404 | 79 | 177 | 84 | 2 | 100 |
| 68 | 835 | 81 | 3.3 | 2.6 | 634 | 82 | 201 | 79 | 8 | 100 |
| 69 | 603 | 82 | 3.7 | 3.1 | 455 | 82 | 148 | 82 | 8 | 100 |
| 70 | 674 | 78 | 4.1 | 3.1 | 489 | 78 | 185 | 77 | 7 | 100 |
| 71 | 526 | 82 | 4.0 | 3.3 | 362 | 80 | 164 | 85 | 0 | N/A |
| 72 | 170 | 82 | 7.0 | 5.7 | 121 | 80 | 49 | 88 | 1 | 100 |
| 73 | 193 | 76 | 7.9 | 6.0 | 150 | 78 | 43 | 70 | 3 | 100 |
| 74 | 566 | 78 | 4.4 | 3.4 | 431 | 78 | 135 | 78 | 4 | 100 |
| 75 | 567 | 77 | 4.5 | 3.5 | 416 | 77 | 151 | 77 | 2 | 100 |
| 76 | 531 | 83 | 3.8 | 3.2 | 426 | 83 | 105 | 85 | 2 | 100 |
| 77 | 416 | 84 | 4.1 | 3.5 | 340 | 85 | 76 | 83 | 2 | 100 |
| 78 | 468 | 81 | 4.4 | 3.5 | 358 | 80 | 110 | 85 | 11 | 100 |
| 79 | 1,045 | 75 | 3.5 | 2.6 | 811 | 75 | 234 | 76 | 11 | 100 |
| 80 | 635 | 77 | 4.3 | 3.3 | 478 | 76 | 157 | 79 | 9 | 100 |
| 81 | 309 | 69 | 7.5 | 5.2 | 246 | 68 | 63 | 71 | 4 | 100 |
| 82 | 277 | 82 | 5.5 | 4.5 | 207 | 81 | 70 | 86 | 3 | 100 |
| 83 | 867 | 80 | 3.4 | 2.7 | 668 | 81 | 199 | 75 | 6 | 100 |
| 84 | 835 | 72 | 4.2 | 3.0 | 682 | 71 | 153 | 77 | 15 | 100 |
| 85 | 155 | 72 | 9.9 | 7.1 | 108 | 69 | 47 | 77 | 1 | 100 |
| 86 | 233 | 70 | 8.5 | 5.9 | 191 | 68 | 42 | 76 | 2 | 100 |
| 87 | 290 | 70 | 7.6 | 5.3 | 223 | 69 | 67 | 73 | 2 | 100 |
| 88 | 709 | 75 | 4.2 | 3.2 | 549 | 78 | 160 | 66 | 10 | 100 |
| 89 | 62 | 66 | 17.8 | 11.8 | 50 | 68 | 12 | 58 | 0 | N/A |
| 90 | 169 | 61 | 12.1 | 7.4 | 133 | 62 | 36 | 56 | 5 | 40 |
| 91 | 200 | 65 | 10.2 | 6.6 | 168 | 67 | 32 | 56 | 2 | 100 |
| 92 | 497 | 64 | 6.5 | 4.2 | 361 | 64 | 136 | 65 | 1 | 100 |
| 93 | 310 | 67 | 7.9 | 5.2 | 252 | 67 | 58 | 66 | 16 | 100 |
| 94 | 1,017 | 81 | 3.0 | 2.4 | 873 | 82 | 144 | 75 | 8 | 100 |
| 95 | 345 | 60 | 8.6 | 5.2 | 238 | 63 | 107 | 54 | 2 | 100 |
| 96 | 121 | 47 | 18.9 | 8.9 | 101 | 48 | 20 | 45 | 0 | N/A |
| 97 | 103 | 68 | 13.3 | 9.0 | 87 | 69 | 16 | 63 | 1 | 100 |
| 98 | 212 | 69 | 8.9 | 6.2 | 168 | 70 | 44 | 66 | 3 | 100 |
| 99 | 81 | 69 | 14.5 | 10.1 | 67 | 70 | 14 | 64 | 1 | 100 |
| 100 | 340 | 63 | 8.1 | 5.1 | 244 | 62 | 96 | 66 | 2 | 100 |

**TABLE C-1. SUMMARY OF DATA (continued)**

| | ALL FRONT SEAT OCCUPANTS | | | | CATEGORY | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | DRIVERS | | FRONT SEAT PASSENGERS | | UNDER FOUR (FRONT AND REAR) | |
| Location Number | Sample | Percent Usage | Relative Error* | Confidence Interval* | Sample | Percent Usage | Sample | Percent Usage | Sample | Percent Usage |
| 101 | 204 | 61 | 10.9 | 6.7 | 166 | 64 | 38 | 50 | 3 | 67 |
| 102 | 924 | 78 | 3.4 | 2.7 | 735 | 79 | 189 | 77 | 5 | 100 |
| 103 | 631 | 84 | 3.4 | 2.9 | 527 | 84 | 104 | 82 | 5 | 100 |
| 104 | 606 | 84 | 3.5 | 2.9 | 525 | 84 | 81 | 83 | 2 | 100 |
| 105 | 923 | 77 | 3.5 | 2.7 | 654 | 80 | 269 | 69 | 11 | 100 |
| 106 | 634 | 81 | 3.8 | 3.1 | 498 | 81 | 136 | 81 | 5 | 100 |
| 107 | 412 | 82 | 4.6 | 3.7 | 279 | 83 | 133 | 80 | 1 | 100 |
| 108 | 920 | 82 | 3.0 | 2.5 | 712 | 83 | 208 | 78 | 6 | 100 |
| 109 | 775 | 80 | 3.5 | 2.8 | 618 | 80 | 157 | 79 | 6 | 100 |
| 110 | 617 | 86 | 3.2 | 2.7 | 518 | 86 | 99 | 85 | 9 | 100 |
| 111 | 810 | 81 | 3.4 | 2.7 | 658 | 81 | 152 | 80 | 3 | 100 |
| 112 | 556 | 77 | 4.5 | 3.5 | 419 | 76 | 137 | 81 | 4 | 100 |
| 113 | 581 | 90 | 2.7 | 2.5 | 354 | 90 | 227 | 90 | 0 | N/A |
| 114 | 882 | 79 | 3.4 | 2.7 | 705 | 80 | 177 | 76 | 6 | 100 |
| 115 | 1,069 | 81 | 2.9 | 2.3 | 851 | 82 | 218 | 79 | 8 | 100 |
| 116 | 945 | 77 | 3.5 | 2.7 | 768 | 77 | 177 | 79 | 5 | 100 |
| 117 | 894 | 78 | 3.5 | 2.7 | 588 | 77 | 306 | 80 | 8 | 100 |
| 118 | 592 | 85 | 3.3 | 2.9 | 493 | 85 | 99 | 85 | 9 | 100 |
| 119 | 616 | 78 | 4.2 | 3.3 | 488 | 77 | 128 | 78 | 4 | 100 |
| 120 | 690 | 64 | 5.6 | 3.6 | 548 | 64 | 142 | 63 | 9 | 89 |
| 121 | 1,006 | 70 | 4.0 | 2.8 | 809 | 71 | 197 | 67 | 8 | 100 |
| 122 | 587 | 74 | 4.8 | 3.6 | 401 | 73 | 186 | 75 | 4 | 100 |
| 123 | 426 | 74 | 5.7 | 4.2 | 296 | 74 | 130 | 74 | 1 | 100 |
| 124 | 655 | 64 | 5.7 | 3.7 | 492 | 64 | 163 | 65 | 3 | 100 |
| 125 | 630 | 67 | 5.5 | 3.7 | 499 | 69 | 131 | 56 | 11 | 100 |
| 126 | 618 | 82 | 3.7 | 3.0 | 472 | 83 | 146 | 78 | 3 | 100 |
| 127 | 534 | 58 | 7.2 | 4.2 | 393 | 61 | 141 | 52 | 14 | 100 |
| 128 | 513 | 61 | 7.0 | 4.2 | 394 | 60 | 119 | 62 | 5 | 100 |
| 129 | 969 | 81 | 3.0 | 2.5 | 853 | 81 | 116 | 80 | 9 | 100 |
| 130 | 1,357 | 59 | 4.4 | 2.6 | 1,079 | 60 | 278 | 56 | 21 | 100 |
| 131 | 1,094 | 70 | 3.9 | 2.7 | 810 | 71 | 284 | 67 | 7 | 86 |
| 132 | 835 | 66 | 4.8 | 3.2 | 662 | 68 | 173 | 61 | 12 | 100 |
| 133 | 533 | 62 | 6.6 | 4.1 | 388 | 61 | 145 | 65 | 8 | 100 |
| 134 | 311 | 77 | 6.1 | 4.7 | 245 | 77 | 66 | 77 | 8 | 88 |
| 135 | 722 | 78 | 3.9 | 3.0 | 502 | 78 | 220 | 78 | 11 | 100 |
| 136 | 679 | 73 | 4.5 | 3.3 | 500 | 73 | 179 | 74 | 16 | 94 |
| 137 | 778 | 79 | 3.6 | 2.8 | 659 | 80 | 119 | 76 | 4 | 100 |
| 138 | 468 | 77 | 5.0 | 3.8 | 394 | 76 | 74 | 81 | 3 | 100 |
| 139 | 568 | 64 | 6.2 | 3.9 | 461 | 64 | 107 | 65 | 10 | 90 |
| 140 | 550 | 71 | 5.4 | 3.8 | 439 | 71 | 111 | 69 | 16 | 100 |
| 141 | 986 | 67 | 4.3 | 2.9 | 789 | 69 | 197 | 62 | 19 | 100 |
| 142 | 359 | 64 | 7.7 | 5.0 | 292 | 67 | 67 | 52 | 0 | N/A |
| 143 | 425 | 81 | 4.6 | 3.8 | 355 | 80 | 70 | 83 | 4 | 100 |
| 144 | 1,085 | 70 | 3.9 | 2.7 | 887 | 70 | 198 | 72 | 8 | 100 |
| 145 | 863 | 65 | 4.8 | 3.2 | 647 | 67 | 216 | 60 | 12 | 100 |
| 146 | 595 | 73 | 4.9 | 3.6 | 409 | 72 | 186 | 75 | 4 | 100 |
| 147 | 516 | 73 | 5.3 | 3.8 | 395 | 74 | 121 | 68 | 19 | 100 |
| 148 | 1,014 | 58 | 5.2 | 3.0 | 757 | 59 | 257 | 56 | 4 | 100 |
| 149 | 498 | 77 | 4.9 | 3.7 | 371 | 76 | 127 | 79 | 0 | N/A |
| 150 | 601 | 83 | 3.6 | 3.0 | 472 | 82 | 129 | 85 | 3 | 100 |

**TABLE C-1. SUMMARY OF DATA (continued)**

| Location Number | ALL FRONT SEAT OCCUPANTS Sample | Percent Usage | Relative Error* | Confidence Interval* | CATEGORY DRIVERS Sample | Percent Usage | FRONT SEAT PASSENGERS Sample | Percent Usage | UNDER FOUR (FRONT AND REAR) Sample | Percent Usage |
|---|---|---|---|---|---|---|---|---|---|---|
| 151 | 316 | 84 | 4.9 | 4.1 | 210 | 82 | 106 | 86 | 1 | 100 |
| 152 | 541 | 76 | 4.7 | 3.6 | 408 | 75 | 133 | 80 | 3 | 100 |
| 153 | 411 | 83 | 4.4 | 3.6 | 285 | 82 | 126 | 84 | 1 | 100 |
| 154 | 518 | 81 | 4.2 | 3.4 | 404 | 81 | 114 | 78 | 3 | 100 |
| 155 | 605 | 60 | 6.4 | 3.9 | 438 | 60 | 167 | 61 | 7 | 100 |
| 156 | 978 | 66 | 4.5 | 3.0 | 702 | 64 | 276 | 69 | 4 | 100 |
| 157 | 618 | 72 | 5.0 | 3.6 | 439 | 70 | 179 | 75 | 5 | 100 |
| 158 | 512 | 58 | 7.4 | 4.3 | 396 | 58 | 116 | 57 | 3 | 100 |
| 159 | 562 | 55 | 7.5 | 4.1 | 390 | 56 | 172 | 54 | 6 | 100 |
| 160 | 509 | 57 | 7.5 | 4.3 | 394 | 55 | 115 | 65 | 2 | 100 |
| 161 | 966 | 69 | 4.2 | 2.9 | 688 | 70 | 278 | 66 | 21 | 90 |
| 162 | 529 | 66 | 6.1 | 4.0 | 394 | 68 | 135 | 60 | 1 | 100 |
| 163 | 715 | 57 | 6.4 | 3.6 | 522 | 56 | 193 | 57 | 17 | 94 |
| 164 | 1,120 | 63 | 4.4 | 2.8 | 837 | 63 | 283 | 65 | 5 | 100 |
| 165 | 398 | 43 | 11.3 | 4.9 | 281 | 44 | 117 | 41 | 13 | 77 |
| 166 | 927 | 70 | 4.2 | 2.9 | 728 | 71 | 199 | 69 | 4 | 100 |
| 167 | 232 | 69 | 8.6 | 6.0 | 181 | 68 | 51 | 73 | 3 | 67 |
| 168 | 381 | 64 | 7.5 | 4.8 | 278 | 65 | 103 | 60 | 8 | 100 |
| 169 | 245 | 55 | 11.3 | 6.2 | 188 | 55 | 57 | 54 | 4 | 100 |
| 170 | 216 | 69 | 9.0 | 6.2 | 157 | 69 | 59 | 66 | 0 | N/A |
| 171 | 198 | 55 | 12.7 | 6.9 | 134 | 56 | 64 | 52 | 0 | N/A |
| 172 | 120 | 58 | 15.1 | 8.8 | 93 | 59 | 27 | 56 | 0 | N/A |
| 173 | 109 | 59 | 15.7 | 9.2 | 88 | 57 | 21 | 67 | 0 | N/A |
| 174 | 910 | 63 | 5.0 | 3.1 | 709 | 63 | 201 | 65 | 4 | 100 |
| 175 | 108 | 48 | 19.6 | 9.4 | 78 | 51 | 30 | 40 | 2 | 100 |
| 176 | 205 | 60 | 11.2 | 6.7 | 155 | 60 | 50 | 60 | 2 | 100 |
| 177 | 426 | 60 | 7.8 | 4.7 | 348 | 60 | 78 | 56 | 6 | 100 |
| 178 | 94 | 68 | 13.8 | 9.4 | 60 | 67 | 34 | 71 | 1 | 100 |
| 179 | 100 | 59 | 16.3 | 9.6 | 83 | 59 | 17 | 59 | 0 | N/A |
| 180 | 489 | 60 | 7.2 | 4.3 | 355 | 59 | 134 | 62 | 7 | 86 |
| 181 | 75 | 49 | 22.9 | 11.3 | 56 | 52 | 19 | 42 | 0 | N/A |
| 182 | 208 | 63 | 10.3 | 6.5 | 153 | 61 | 55 | 69 | 1 | 100 |
| 183 | 100 | 58 | 16.7 | 9.7 | 84 | 55 | 16 | 75 | 0 | N/A |
| 184 | 147 | 44 | 18.2 | 8.0 | 108 | 44 | 39 | 46 | 1 | 100 |
| 185 | 246 | 56 | 11.1 | 6.2 | 174 | 57 | 72 | 53 | 7 | 86 |
| 186 | 803 | 65 | 5.1 | 3.3 | 626 | 65 | 177 | 66 | 7 | 100 |
| 187 | 908 | 86 | 2.6 | 2.3 | 749 | 86 | 159 | 85 | 9 | 100 |
| 188 | 675 | 79 | 3.8 | 3.0 | 521 | 79 | 154 | 79 | 2 | 100 |
| 189 | 1,374 | 56 | 4.7 | 2.6 | 988 | 57 | 386 | 54 | 6 | 100 |
| 190 | 691 | 67 | 5.2 | 3.5 | 501 | 70 | 190 | 61 | 5 | 100 |
| 191 | 728 | 68 | 5.0 | 3.4 | 535 | 67 | 193 | 69 | 7 | 86 |
| 192 | 1,648 | 76 | 2.7 | 2.1 | 1,187 | 75 | 461 | 79 | 8 | 88 |
| 193 | 1,397 | 77 | 2.8 | 2.2 | 1,022 | 77 | 375 | 78 | 8 | 88 |
| 194 | 1,056 | 69 | 4.0 | 2.8 | 822 | 68 | 234 | 71 | 4 | 100 |
| 195 | 962 | 53 | 6.0 | 3.2 | 717 | 53 | 245 | 51 | 6 | 100 |
| 196 | 591 | 59 | 6.7 | 4.0 | 443 | 57 | 148 | 64 | 1 | 100 |
| 197 | 996 | 60 | 5.1 | 3.0 | 748 | 62 | 248 | 54 | 3 | 100 |
| 198 | 554 | 64 | 6.3 | 4.0 | 446 | 66 | 108 | 54 | 5 | 100 |
| 199 | 935 | 62 | 5.0 | 3.1 | 615 | 61 | 320 | 64 | 1 | 100 |
| 200 | 726 | 72 | 4.5 | 3.3 | 528 | 70 | 198 | 76 | 2 | 100 |

* Percent (using 0.95 probability)

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