Research Report
KTC-02-23/KSP1-03-1F

KENTUCKY TRANSPORTATION CENTER

College of Engineering

2003 SAFETY BELT USAGE SURVEY IN KENTUCKY

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2003 SAFETY BELT USAGE SURVEY IN KENTUCKY

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EXECUTIVE SUMMARY

The objective of this study was to establish 2003 safety belt and child safety seat usage rates in Kentucky. The 2003 survey continues to document the results after enactment of a statewide mandatory safety belt law in 1994 and safety belt enforcement campaign. 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 2003 (65.5 percent) was higher than that in 2002 (62.0 percent). This compared to 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 statewide law, of 42 percent.

The 2003 statewide usage rate for children under the age of four was determined to be 94.8 percent. This continues the high rate found for this age category and compares to the previous high of 92.9 percent in 2002.

The statewide law, except for children, involves secondary enforcement. The high usage rate for children can be related to primary enforcement. To obtain the maximum possible increase in usage, the current law should be modified to allow primary, rather than secondary, enforcement for all vehicle occupants. The potential increase which can result from an emphasis on enforcement was shown by the results obtained during the enforcement period of this year's "Buckle Up Kentucky: It's the Law & It's Enforced" campaign. As a minimum, primary enforcement should apply to drivers while they are in the permit and intermediate phase of the graduated license program.

1.0 INTRODUCTION

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 were the "Click It or Ticket" and "Buckle Up Kentucky: It's the Law & It's Enforced" campaigns conducted around Memorial Day in 2001 and 2003, respectively. The most recent legislation in Kentucky in this area was statewide legislation requiring the use of safety belts for all vehicle occupants. This law, which involves secondary enforcement, was passed in 1994 with an effective date of July 1994. Recent attempts to change the legislation to allow primary enforcement have not been successful.

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 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 statewide law 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, and 62 percent in 2001 and 2002. A rate as high as 73 percent was found during the enforcement period of the "Buckle Up Kentucky: It's the Law & It's Enforced" campaign in 2003.

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 93 percent in 2002.

The objective of the survey summarized in this report was to establish statewide safety belt and child safety seat usage rates in Kentucky for 2003. These rates can be compared to those determined from previous surveys.

The 2003 statewide survey also determined how much of an increase could be associated with education and enforcement activities occurring around Memorial Day. A series of mini-surveys found the usage rate increased from a baseline of 62 percent to almost 73 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 campaigns 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 in 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 2003 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 went through a training period prior to beginning data collection. As part of the training, the data collectors reviewed the guidelines and previous reports and collected trial sets of field data. The observers then collected 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 the first week in June of 2003, after the end of the education and enforcement activities associated with the Memorial Day holiday, and continued through the end of July. 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 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 the decision to collect 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 along 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 the state. 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 location 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. 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. Data were typically collected at the intersection of the ramps and intersecting road at interchanges. The exception was at rural interchanges where there were very few exiting vehicles where data were collected on the mainline.

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 to be 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 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 all front seat passengers, drivers, 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 2003, using the data collected at 200 sites and the described weighting procedure, was 65.5 percent. The 95 percent confidence interval was 0.3 percent. The sample size of all front seat occupants was 113,152. The usage rate by region varied from 70.0 percent in Region 2 (north) to 56.6 percent in Region 3 (east) with 64.5 percent in Region 1 (west).

The highest rate by the functional classification of the highway was 74.5 percent for rural interstates with the lowest 54.6 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 2003 was 65.2 percent. Drivers accounted for 77 percent of front seat occupants so they dominated the percentage determined for all front seat occupants. Usage rates for front seat passengers was 66.1 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 (98.5 percent) was higher than that for children one to three years of age (93.3 percent). The usage rate for the combination of these categories, or children under four years of age, was 94.8 percent.

The sample size for children under four years of age was 918. This age category corresponds to the children for which the mandatory child restraint law would apply. The 2003 usage rate of 94.8 percent compares to a range in the previous ten years of 61 percent in 1993 to 93 percent in 2002. 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 97 percent for the rear seat compared to 68 percent for the front seat. For

children under one year old, the usage rate was 100 percent for the rear seat compared to 85 percent for the front seat. The large majority of children were sitting in the rear seat for both age groups (about 89 percent for one to three years of age and 87 percent for under one). The overall percentage of children in the rear seat of 88 percent in 2003 compares to 86 percent in 2002, 85 percent in 2001, 83 percent in 2000, 79 percent in 1999, 80 percent in 1998, and 75 percent in 1997.

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 22 percent to 83 percent. There were five sites which had a usage rate of under 40 percent with all of these sites in the rural minor collector/local category. There were 57 sites which had a usage rate of 70 percent or above with 43 of these being an interstate or parkway location. The highest rate found on a non-interstate or parkway was 76 percent on a rural principal arterial road (US 60 at US 62) in Woodford 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 had steadily increased from 4 percent in 1982 to 42 percent in 1993. However, the amount of the yearly increase had decreased. 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 has continued with 60 percent in 2000, 61.9 percent in 2001, 62.0 in 2002, and 65.5 percent in 2003. The larger increase in 2003 would be related to the "Buckle Up Kentucky: It's the Law & It's Enforced" campaign.

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 71.7 percent for sport utility vehicles down to 50.4 percent for pickup trucks. The rate for passenger cars was 69.6 percent with 71.1 percent for vans. 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 25 percent of the sample. The largest portion of the sample was for passenger cars with 50 percent followed by 15 percent for sport utility vehicles and 10 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, 164 of 452 motorcyclists were observed not wearing a helmet with a weighted usage rate was 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 and 57 in 2002 with a sample size of 596. Usage was very similar in 2003 with a usage rate of 56 percent. The usage rate was the highest in the east region of the state with 62 percent followed by 53 percent in the west region and 52 percent in the north region.

Bicycle helmet use was only observed for 72 bicyclists. Only 14 of these bicyclists were wearing a helmet. This low rate (19 percent) shows the need for additional public information about this subject. This rate is lower than the 24 percent in 2000, but higher than that found in previous years (9 percent in 2002, 18 percent in 2001, 12 percent in 1999, 9 percent in 1998, and 8 percent in 1997).

4.0 SUMMARY

Observations were taken at 200 sites across Kentucky to obtain safety belt usage rates. The 2003 survey resulted in a sample size of 113,152 front seat occupants (including 86,583 drivers). The data collection procedure and site selection criteria were based on national criteria.

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 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. The trend in usage rates from 1982 through 2003 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 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 94.8 percent in 2003. This compares to 92.9 percent in 2002, 89 percent in 2001, 87 percent in 2000, 89 percent in 1999 and 80 percent in 1998 and continues to show the high usage for this age group. One reason for the very high usage for small children is that primary, rather than secondary, enforcement applies.

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 2003. 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 very low (19 percent).

While the statewide usage rate of 65.5 percent represents a 3.5 percentage point increase from 2002, the rate is lower than the peak of 72.5 percent found for a mini-survey taken during the enforcement phase of the "Buckle Up Kentucky: It's the Law & It's Enforced" campaign (which was conducted around Memorial Day in 2003). A usage rate of 65.7 percent was found at the 21 mini-survey locations taken as part of the full survey (which compares to 65.5 percent for all 200 locations).

5.0 RECOMMENDATIONS

The data show that the level of safety belt usage in 2003 is the highest since the start of the surveys in 1982. The increase in 2003, compared to 2002 (62.0 to 65.5 percent), can be related to efforts in the areas of both education and enforcement activities. Public information and education should continue. Also, enforcement of the law, along with public information about this enforcement and resulting citations, should continue to be increased.

However, the benefits which can be gained through education and enforcement of a secondary law are limited. The reduction in usage since the end of the enforcement phase of the "Buckle Up Kentucky: It's the Law & It's Enforced" campaign in 2003 supports this conclusion. Usage reached 73 percent during the enforcement phase of the campaign. The very high usage for small children can be partially attributed to primary enforcement. To obtain the maximum usage for all

vehicle occupants, the current law should be modified to allow primary, rather than secondary, enforcement. As a minimum, primary enforcement should be effective for drivers in the permit and intermediate phase of the graduated license program.

The survey data can be used to identify areas in need of additional 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.

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

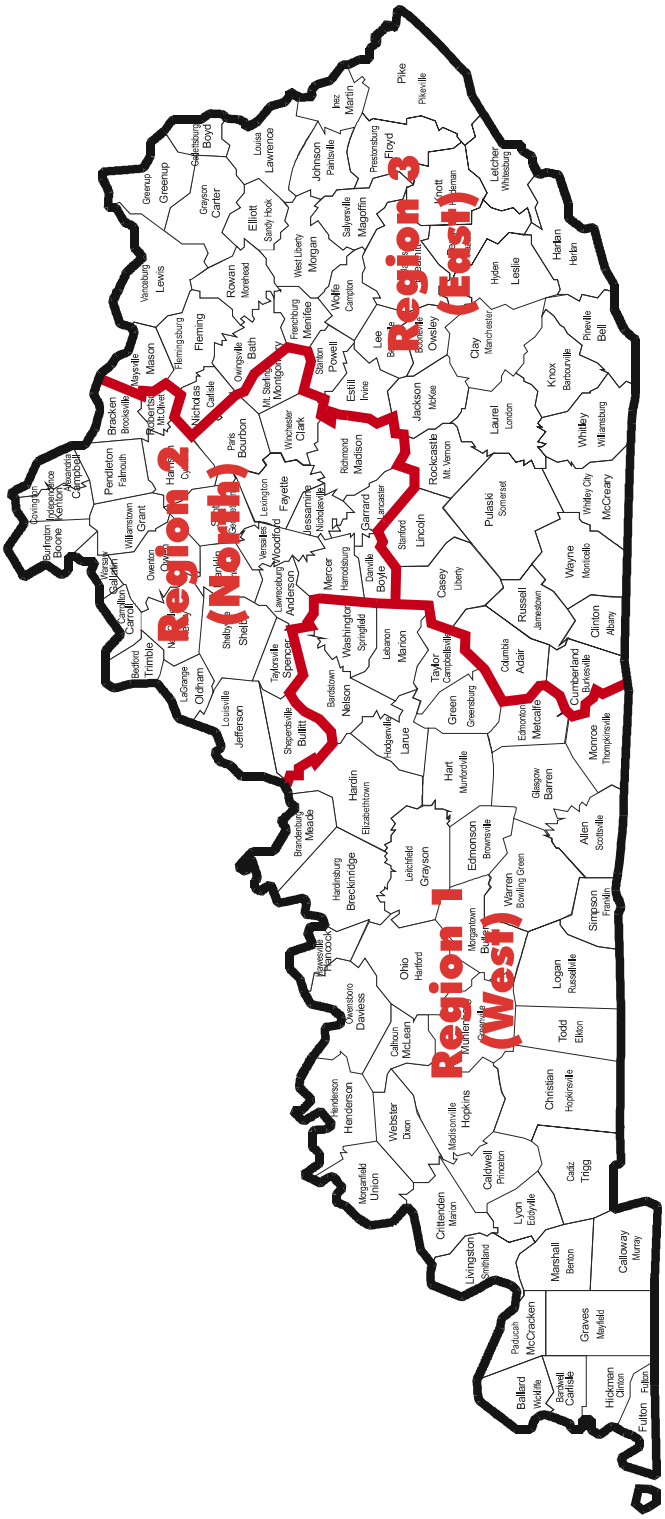

Table 1. SURVEY LOCATIONS

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 Rest Area (Sonora)	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 2	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 3214 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	77.8	74.66	69.1	74.5
Rural Principal Arterial	69.9	76.26	57.0	64.9
Rural Minor Arterial/Major Collector	56.9	64.80	49.4	56.1
Rural Minor Collector/Local	51.1	61.57	54.9	54.6
Urban Interstate/Freeway	72.2	73.66	76.0	73.6
Urban Principal Arterial	64.2	63.82	59.6	63.4
Urban Minor Arterial/Collector/Local	64.8	65.98	56.6	64.6
All	64.5	70.0	56.6	65.5

TABLE 3. USAGE RATE FOR DRIVERS

	PERCENT USAGE			
	REGION			
FUNCTIONAL CLASSIFICATION	WEST	NORTH	EAST	ALL
Rural Interstate	76.7	73.7	67.9	73.4
Rural Principal Arterial	70.0	76.8	56.5	64.8
Rural Minor Arterial/Major Collector	56.4	65.0	50.3	56.3
Rural Minor Collector/Local	50.3	62.8	55.0	54.6
Urban Interstate/Freeway	71.5	73.0	72.8	72.8
Urban Principal Arterial	65.6	63.4	59.6	63.4
Urban Minor Arterial/Collector/Local	64.5	66.1	57.2	64.6
All	64.3	69.6	56.5	65.2

TABLE 4. USAGE RATE FOR ALL FRONT SEAT PASSENGERS

	PERCENT USAGE			
	REGION			
FUNCTIONAL CLASSIFICATION	WEST	NORTH	EAST	ALL
Rural Interstate	80.5	77.6	72.7	77.4
Rural Principal Arterial	69.1	72.9	58.5	64.8
Rural Minor Arterial/Major Collector	58.5	63.4	46.7	55.5
Rural Minor Collector/Local	55.0	57.2	55.1	55.5
Urban Interstate/Freeway	74.2	75.5	84.3	75.5
Urban Principal Arterial	58.1	64.7	59.6	62.4
Urban Minor Arterial/Collector/Local	65.9	65.6	55.1	64.5
All	65.0	70.8	56.8	66.1

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	96.9	97.5	97.8
Rural Principal Arterial	98.5	100.0	82.7	91.6
Rural Minor Arterial/Major Collector	99.1	100.0	97.9	98.9
Rural Minor Collector/Local	92.9	100.0	75.1	86.9
Urban Interstate/Freeway	65.1	95.8	100.0	92.6
Urban Principal Arterial	98.6	94.5	96.3	95.8
Urban Minor Arterial/Collector/Local	97.3	97.2	93.0	96.7
All	95.6	96.6	89.6	94.8

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

*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	80.7	79.9	72.4	78.8
Rural Principal Arterial	75.9	80.3	61.5	70.0
Rural Minor Arterial/Major Collector	58.4	70.5	56.4	60.6
Rural Minor Collector/Local	56.1	67.7	60.9	60.2
Urban Interstate/Freeway	77.0	76.0	78.9	76.2
Urban Principal Arterial	66.8	65.9	65.3	66.1
Urban Minor Arterial/Collector/Local	69.5	72.0	60.8	70.0
All	68.3	73.7	61.9	69.6
Pickup Trucks				
Rural Interstate	62.2	58.0	51.6	57.9
Rural Principal Arterial	54.5	54.8	44.0	49.8
Rural Minor Arterial/Major Collector	47.7	46.3	36.7	43.5
Rural Minor Collector/Local	37.1	46.1	40.8	40.3
Urban Interstate/Freeway	57.9	57.1	62.7	57.3
Urban Principal Arterial	53.2	49.7	46.1	50.1
Urban Minor Arterial/Collector/Local	51.7	46.3	44.2	47.5
All	51.7	53.0	43.0	50.4
Vans				
Rural Interstate	82.6	77.2	76.5	78.4
Rural Principal Arterial	76.1	91.4	63.1	72.2
Rural Minor Arterial/Major Collector	68.2	66.2	54.2	62.8
Rural Minor Collector/Local	63.2	72.2	59.6	63.4
Urban Interstate/Freeway	77.0	78.3	78.3	78.2
Urban Principal Arterial	70.6	69.0	58.0	67.9
Urban Minor Arterial/Collector/Local	69.1	71.0	65.1	69.8
All	72.1	74.7	61.7	71.1
Sport Utility Vehicles				
Rural Interstate	80.1	80.0	72.7	78.7
Rural Principal Arterial	79.2	84.3	61.7	72.0
Rural Minor Arterial/Major Collector	66.5	78.6	59.3	66.8
Rural Minor Collector/Local	62.4	68.6	58.3	61.9
Urban Interstate/Freeway	75.7	77.6	81.3	77.5
Urban Principal Arterial	66.8	66.7	65.4	66.6
Urban Minor Arterial/Collector/Local	70.2	75.8	60.4	72.5
All	71.5	75.9	62.4	71.7

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	2.9	2.4	3.9	1.2
Rural Principal Arterial	2.4	4.2	3.1	1.1
Rural Minor Arterial/Major Collector	4.0	4.0	6.1	1.6
Rural Minor Collector/Local	5.0	6.4	4.9	2.6
Urban Interstate/Freeway	2.4	1.4	4.8	0.9
Urban Principal Arterial	2.8	1.7	3.5	1.0
Urban Minor Arterial/Collector/Local	2.7	2.3	3.5	1.1
All	0.8	0.6	1.3	0.5

* 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	2.3	1.8	2.7	0.9
Rural Principal Arterial	1.7	3.2	1.8	0.7
Rural Minor Arterial/Major Collector	2.3	2.6	3.0	0.9
Rural Minor Collector/Local	2.6	3.9	2.7	1.4
Urban Interstate/Freeway	1.7	1.0	3.6	0.7
Urban Principal Arterial	1.8	1.1	2.1	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	362	73	6.2	4.5	265	72	97	77	0	N/A
2	273	77	6.5	5.0	191	74	82	83	2	100
3	240	80	6.3	5.1	167	81	73	77	2	100
4	317	78	5.8	4.5	224	77	93	81	3	100
5	571	81	4.0	3.2	398	79	173	84	3	100
6	521	83	3.8	3.2	376	84	145	83	3	100
7	546	76	4.7	3.6	377	75	169	78	3	100
8	462	74	5.4	4.0	339	72	123	80	2	100
9	159	77	8.4	6.5	115	77	44	77	0	N/A
10	724	55	6.6	3.6	547	56	177	50	7	86
11	1,583	58	4.2	2.4	1,102	54	481	68	13	100
12	910	66	4.7	3.1	726	65	184	70	5	100
13	260	79	6.3	5.0	224	79	36	81	1	100
14	330	67	7.5	5.1	261	67	69	67	2	100
15	288	75	6.7	5.0	200	77	88	72	4	100
16	496	70	5.7	4.0	430	71	66	64	2	100
17	518	65	6.3	4.1	397	65	121	65	7	100
18	729	64	5.4	3.5	548	62	181	72	0	N/A
19	1,031	68	4.1	2.8	801	67	230	74	4	100
20	574	63	6.3	4.0	482	64	92	58	2	100
21	529	50	8.6	4.3	400	49	129	51	2	100
22	271	55	10.7	5.9	214	57	57	51	4	100
23	524	58	7.2	4.2	393	55	131	68	3	100
24	266	68	8.2	5.6	209	67	57	75	0	N/A
25	280	55	10.5	5.8	221	54	59	61	1	100
26	551	53	7.8	4.2	403	54	148	52	3	100
27	2,297	59	3.4	2.0	1,769	59	528	56	39	97
28	377	52	9.7	5.0	285	54	92	46	6	83
29	953	58	5.4	3.1	721	58	232	60	12	100
30	327	50	10.8	5.4	249	50	78	51	1	100
31	389	49	10.2	5.0	298	49	91	47	0	N/A
32	260	62	9.5	5.9	189	59	71	69	1	100
33	563	53	7.7	4.1	434	52	129	58	5	100
34	113	35	24.9	8.8	80	39	33	27	0	N/A
35	80	56	19.3	10.9	63	57	17	53	2	100
36	172	55	13.6	7.4	142	51	30	70	1	100
37	568	60	6.8	4.0	430	58	138	64	4	100
38	648	49	7.8	3.8	504	49	144	51	7	86
39	76	42	26.4	11.1	53	43	23	39	1	0
40	64	44	27.8	12.2	52	44	12	42	0	N/A
41	404	75	5.7	4.2	292	76	112	71	3	100
42	632	80	3.9	3.1	454	79	178	83	2	100
43	324	77	5.9	4.6	229	74	95	84	0	N/A
44	834	72	4.2	3.0	676	73	158	70	5	100
45	776	66	5.0	3.3	602	64	174	74	1	0
46	232	78	6.9	5.4	171	75	61	84	0	N/A
47	1,559	73	3.0	2.2	1,157	73	402	75	9	100
48	431	61	7.6	4.6	328	61	103	61	4	75
49	1,065	64	4.5	2.9	865	65	200	62	14	93
50	1,129	62	4.5	2.8	840	60	289	69	6	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	937	58	5.5	3.2	684	57	253	60	6	100
52	1,125	60	4.8	2.9	877	59	248	62	10	100
53	382	62	7.9	4.9	296	63	86	57	3	100
54	1,171	63	4.4	2.8	949	66	222	52	5	100
55	1,075	62	4.7	2.9	779	59	296	69	9	89
56	1,290	76	3.1	2.3	973	75	317	80	13	100
57	723	74	4.3	3.2	561	74	162	75	6	100
58	464	60	7.4	4.5	360	60	104	61	7	100
59	108	57	16.2	9.3	95	57	13	62	0	N/A
60	491	57	7.7	4.4	389	55	102	63	8	100
61	407	57	8.4	4.8	309	56	98	60	4	100
62	543	52	8.0	4.2	438	52	105	53	19	84
63	490	58	7.5	4.4	398	59	92	54	4	100
64	501	65	6.4	4.2	372	65	129	66	2	100
65	426	63	7.3	4.6	329	61	97	67	7	100
66	415	61	7.7	4.7	323	60	92	64	4	100
67	350	75	6.0	4.5	245	72	105	83	0	N/A
68	667	81	3.7	3.0	517	79	150	85	3	100
69	436	79	4.9	3.8	388	79	98	78	2	100
70	406	67	6.8	4.6	297	67	109	70	0	N/A
71	450	79	4.7	3.7	332	78	118	84	4	100
72	206	80	6.9	5.5	155	78	51	84	0	N/A
73	188	73	8.6	6.3	146	73	42	76	1	100
74	479	78	4.8	3.7	378	79	101	74	0	N/A
75	369	62	8.1	5.0	258	59	111	67	1	100
76	372	71	6.5	4.6	297	71	75	72	11	91
77	539	81	4.1	3.3	392	80	147	84	0	N/A
78	347	78	5.6	4.4	267	76	80	84	3	100
79	1,037	63	4.7	2.9	791	62	246	65	1	100
80	632	76	4.3	3.3	511	76	121	80	1	100
81	324	63	8.3	5.2	267	64	57	61	0	N/A
82	185	79	7.4	5.9	156	81	29	69	0	N/A
83	846	68	4.7	3.1	639	68	207	67	3	100
84	859	69	4.4	3.1	692	69	167	70	7	100
85	130	68	11.9	8.0	93	63	37	78	0	N/A
86	218	64	9.9	6.4	163	65	55	62	1	100
87	244	57	11.0	6.2	191	54	53	64	2	100
88	1,213	67	3.9	2.6	1,021	67	192	70	12	100
89	52	56	24.2	13.5	37	57	15	53	0	N/A
90	205	59	11.4	6.7	152	61	53	55	3	100
91	158	56	13.9	7.7	120	55	38	58	1	100
92	573	59	6.8	4.0	457	58	116	62	1	100
93	201	56	12.3	6.9	163	55	38	61	7	100
94	761	74	4.2	3.1	680	75	81	68	5	100
95	201	50	13.9	6.9	151	51	50	46	0	N/A
96	32	38	44.7	16.8	25	44	7	14	0	N/A
97	99	61	15.9	9.6	75	59	24	67	2	100
98	179	56	12.9	7.3	136	56	43	58	4	100
99	61	64	18.8	12.0	47	62	14	71	0	N/A
100	244	68	8.5	5.8	190	70	54	63	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
101	397	60	8.0	4.8	292	59	105	64	5	80
102	1,117	74	3.5	2.6	790	73	327	75	14	100
103	1,036	82	2.9	2.3	713	82	323	82	46	93
104	353	77	5.7	4.4	224	73	129	83	1	100
105	975	70	4.1	2.9	795	70	180	69	8	100
106	694	69	4.9	3.4	564	66	130	82	6	100
107	250	80	6.3	5.0	191	77	59	88	0	N/A
108	833	81	3.3	2.7	624	81	209	82	5	100
109	660	78	4.1	3.2	476	77	184	79	3	100
110	1,136	73	3.6	2.6	953	72	183	77	4	100
111	767	78	3.8	3.0	693	77	74	78	6	100
112	209	72	8.5	6.1	167	70	42	79	0	N/A
113	431	72	5.9	4.2	347	71	84	75	1	100
114	801	71	4.5	3.2	672	72	129	65	4	75
115	1,335	78	2.9	2.2	949	77	386	79	15	100
116	818	72	4.2	3.1	642	70	176	82	4	100
117	819	69	4.6	3.2	579	67	240	72	3	67
118	537	69	5.7	3.9	447	69	90	68	0	N/A
119	449	77	5.1	3.9	374	74	75	88	3	67
120	550	62	6.5	4.1	387	60	163	67	2	100
121	1,530	66	3.6	2.4	1,193	65	337	68	21	90
122	740	61	5.8	3.5	515	60	225	62	1	100
123	329	68	7.4	5.0	283	70	46	57	3	100
124	577	55	7.4	4.1	427	57	150	49	8	75
125	502	63	6.7	4.2	374	61	128	70	0	N/A
126	1,132	74	3.4	2.5	940	74	192	78	14	100
127	543	50	8.3	4.2	447	51	96	49	2	50
128	528	62	6.7	4.1	426	60	102	67	4	100
129	940	73	3.9	2.8	693	72	247	74	6	100
130	1,430	59	4.4	2.6	1,157	60	273	54	2	100
131	1,269	62	4.3	2.7	1,025	63	244	59	15	100
132	686	63	5.7	3.6	547	65	139	55	1	100
133	512	53	8.2	4.3	402	52	110	55	4	100
134	241	59	10.4	6.2	192	58	49	65	7	86
135	908	59	5.4	3.2	717	59	191	59	8	88
136	890	62	5.1	3.2	702	63	188	60	14	93
137	771	73	4.3	3.1	623	72	148	78	18	100
138	434	62	7.4	4.6	342	61	92	65	6	83
139	708	52	7.0	3.7	573	54	135	45	10	80
140	709	66	5.3	3.5	549	67	160	63	9	100
141	803	57	6.0	3.4	655	56	148	59	6	100
142	365	53	9.6	5.1	308	55	57	42	2	100
143	398	70	6.5	4.5	351	70	47	72	6	100
144	1,100	68	4.1	2.8	939	69	161	62	11	91
145	504	57	7.7	4.3	409	58	95	52	4	100
146	255	53	11.5	6.1	194	52	61	59	0	N/A
147	542	64	6.4	4.0	432	64	110	61	14	100
148	1,181	48	5.9	2.8	944	50	237	40	13	100
149	450	66	6.7	4.4	332	64	118	72	3	100
150	520	72	5.3	2.9	347	73	173	71	4	75

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
151	420	71	6.1	4.3	290	72	130	69	0	N/A
152	499	70	5.8	4.0	360	67	139	76	2	100
153	352	82	4.9	4.0	246	81	106	84	1	100
154	434	72	5.8	4.2	328	73	106	72	2	100
155	543	54	7.8	4.2	406	54	137	54	3	67
156	852	65	5.0	3.2	594	63	258	69	3	100
157	624	60	6.4	3.8	430	60	194	60	3	100
158	400	58	8.3	4.8	285	58	115	59	3	33
159	426	58	8.0	4.7	332	59	94	56	2	100
160	606	50	8.0	4.0	493	49	113	52	7	86
161	823	54	6.3	3.4	607	56	216	51	8	88
162	565	58	7.0	4.1	423	57	142	61	4	100
163	618	52	7.6	3.9	460	52	158	52	4	100
164	960	58	5.3	3.1	668	57	292	61	5	100
165	277	55	10.6	5.9	213	54	64	61	1	100
166	774	64	5.3	3.4	552	64	222	63	8	75
167	244	50	12.5	6.3	178	49	66	53	0	N/A
168	215	53	12.5	6.7	154	56	61	48	4	100
169	202	49	14.2	6.9	161	50	41	44	2	100
170	247	58	10.6	6.2	184	57	63	62	1	100
171	123	44	20.0	8.8	96	45	27	41	0	N/A
172	131	44	19.5	8.5	103	41	28	54	0	N/A
173	91	49	20.8	10.3	74	51	17	41	0	N/A
174	899	54	6.0	3.3	642	54	257	54	12	100
175	172	45	16.4	7.4	128	48	44	36	1	100
176	195	50	14.1	7.0	139	49	56	52	3	100
177	314	53	10.4	5.5	234	58	80	38	5	80
178	83	54	19.8	10.7	57	54	26	54	0	N/A
179	16	50	49.0	24.5	13	46	3	67	0	N/A
180	401	47	10.4	4.9	288	50	113	40	7	57
181	50	36	37.0	13.3	35	37	15	33	1	100
182	212	51	13.2	6.7	160	50	52	54	1	100
183	65	45	27.1	12.1	49	43	16	50	0	N/A
184	60	22	48.1	10.4	53	21	7	29	0	N/A
185	251	34	17.3	5.9	199	33	52	37	5	80
186	779	63	5.4	3.4	600	62	179	66	6	83
187	497	76	5.0	3.8	362	72	135	84	0	N/A
188	526	81	4.2	3.4	374	80	152	82	5	100
189	841	57	5.9	3.3	614	57	227	55	2	100
190	1,411	65	3.8	2.5	1,081	64	330	68	10	100
191	861	66	4.8	3.2	608	65	253	68	6	100
192	1,505	71	3.2	2.3	1,149	70	356	72	12	100
193	756	61	5.7	3.5	570	62	186	56	3	33
194	1,036	61	4.8	3.0	731	60	305	66	6	100
195	764	49	7.2	3.5	561	50	203	45	8	88
196	539	55	7.6	4.2	386	58	153	48	5	80
197	1,051	55	5.5	3.0	812	53	239	62	6	100
198	568	53	7.7	4.1	436	54	132	52	6	67
199	958	59	5.3	3.1	710	59	248	57	7	100
200	853	63	5.2	3.2	634	62	219	64	6	83

* Percent (using 0.95 probability)