Research Report
KTC-00-15

KENTUCKY TRANSPORTATION CENTER

College of Engineering

2000 SEAT BELT USAGE SURVEY IN KENTUCKY

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Kentucky Transportation Center
176 Raymond Building
University of Kentucky
Lexington, Kentucky 40506-0281

(859) 257-4513
(859) 257-1815 (FAX)
1-800-432-0719
www.ktc.uky.edu
ktc@engr.uky.edu

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2000 SAFETY BELT USAGE SURVEY IN KENTUCKY

by

Kenneth R. Agent
Transportation Research Engineer

Kentucky Transportation Center
College of Engineering
University of Kentucky
Lexington, Kentucky

in cooperation with
Kentucky State Police
Commonwealth of Kentucky

August 2000

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EXECUTIVE SUMMARY

The objective of this study was to establish 2000 safety belt and child safety seat usage rates in Kentucky. The 2000 survey continues to document the results after enactment of a statewide mandatory safety belt law in 1994. Data were collected at 200 randomly selected sites spread across Kentucky. Data from the individual sites were combined into a statewide percentage considering function classification, geographic region, and vehicle miles traveled.

The data show that the usage rate increase found in 1999, after a few years where the rate had remained at a stable level, continued in 2000 to a smaller degree. The usage rate for front seat occupants was 60 percent in 2000 compared to 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 2000 statewide usage rate for children under the age of four was determined to be 87 percent. This continues the high rate found for this age category and compares to the high of 89 percent in 1999.

The statewide law, except for children, involves secondary enforcement. The higher rate for children could partially 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. 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 the 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. 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.

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

Statewide observational surveys were first conducted in Kentucky in 1982, with data collected at 23 sites in 19 cities across the state. These surveys have been conducted annually since 1982 (with the exception of 1987) to document safety belt and safety seat usage in Kentucky. The number of sites was increased to 100 in 1990 in order to obtain a more representative statewide sample. There was some modifications to the 100 sites in 1998 to increase distribution across the state. The number of sites was again increased (to 200 sites) for the 1999 survey with a new sampling plan used to select the sites.

The safety belt usage rate for drivers increased each survey year from 1982 through 1994. The statewide driver safety belt usage rate was only 4 percent in 1982. It steadily increased to a level of approximately 40 percent in 1991. There was a large increase 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. Considering all front seat occupants, the usage rate was also 54 percent in 1997 and 1998. The rate for drivers and all front seat occupants increased to 59 percent in 1999.

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 in 1984, and stayed at this level through 1986. After a financial penalty was added to the law, this percentage increased to almost 50 percent in 1988 and 1989, 57 percent in 1990 and 1991, and slightly over 60 percent in 1992 and 1993. There has been a continued general increasing trend in usage with 72 percent in 1994, 66 percent in 1995, 79 percent in 1996, 82 percent in 1997, 80 percent in 1998, and 89 percent in 1999.

The objective of the survey summarized in this report was to establish statewide safety belt and child safety seat usage rates in Kentucky for 2000. These rates can be compared to those determined from previous surveys. The 2000 survey determined whether the increase found in 1999, compared to the previous few years, continued. The 59 percent usage rate in 1999 was the first year which showed an rate above the 58 percent level in 1994 immediately after implementation of the statewide law.

2.0 PROCEDURE

2.1 DATA COLLECTION PROCEDURE

The original data collection procedure used in the surveys, which started in 1982, was first modified in 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. Safety belt usage was 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 was for children under four years of age for which data were collected for both the front and the rear seats.

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

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

Two additional types of information were 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 starting the collection of data. 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 each of the 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. Always 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 collect data for all vehicles, record data for the next vehicle in view after recording data for the prior vehicle.

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

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

7. Only include vehicles either stopped or moving 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 in May of 2000 and continued into 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 to select observational sites.

As part of the sampling design plan started in 1999, the decision was made to take survey data at 200 sites. It was also decided that data would typically be collected 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 the accuracy of the data 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 location of 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 (which would be 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 of the intersections or interchanges 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	22	8
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) is 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. Some of the sites were grouped based on geographical region to aid the efficiency of the data collection.

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 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. This data were also determined for each of the 21 strata, the three regions, and the seven functional classes. The software used in this analysis was SAS for Windows, version 8. The relative error and confidence interval was also determined for 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 2000, using the data collected at 200 sites and the described weighting procedure, was 59.8 percent. The 95 percent confidence interval was 0.5

percent. The sample size of all front seat occupants was 119,844. The usage rate by region varied from 64.1 percent in Region 2 (north) to 50.4 percent in Region 3 (east) with 59.6 percent in Region 2 (west). The highest rate by the functional classification of the highway was 69.5 percent for rural interstates with the lowest 49.1 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 2000 was 60.3 percent. Drivers accounted for 78 percent of front seat occupants so they dominated the percentage determined for all front seat occupants. Usage rates for front seat passengers was 57.6 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 (93.4 percent) was higher than that for children one to three years of age (83.4 percent). The usage rate for the combination of these categories, or children under four years of age, was 87.2 percent.

The sample size for children under four years of age was 2,063. This age category corresponds to the children for which the mandatory child restraint law would apply. The 2000 usage rate of 87.2 compares to 89.2 percent in 1999, 80 percent in 1998, 82 percent in 1997, 79 percent in 1996, 66 percent in 1995, 72 percent in 1994, 61 percent in 1993, 62 percent in 1992, and 57 percent in 1990 and 1991. This percentage was about 15 percent in 1982 before enactment of the child restraint law, 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 91 percent for the rear seat compared to 51 percent for the front seat. For children under one year old, the usage rate was 99 percent for the rear seat compared to 77 percent for the front seat. The large majority of children were sitting in the rear seat for both age groups (about 81 percent for one to three years of age and 88 percent for under one). The overall percentage of children in the rear seat of 83 percent in 2000 compares to 79 percent in 1999, 80 percent in 1998, 75 percent in 1997, and 57 percent in 1996.

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 is given for the "all front seat occupant" category. Usage rates for front seat occupants ranged from 26 percent to 82 percent. There were two sites which had a usage rate of under 30 percent and both were in the rural minor collector/local category. There were 33 sites which had a usage rate of 70 percent or above with 30 of these an interstate or parkway location. The highest rate found on a non-interstate or parkway was 77 percent on Harrodsburg Road in Lexington. There were only 9 sites with a usage rate under 40 percent with 6 in the rural minor collector/local category.

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 4.2 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 rate immediately after enactment of the law. This level continued through 1998 before the increase to 59 percent in 1999. There was another smaller increase to 60 percent in 2000.

A substantial difference in usage rate (for all front seat occupants) was noted when vehicle type is considered (Table 7). The rate varied from substantially from 67.4 percent for sport utility vehicles down to 42.5 percent for pickup trucks. The rate for passenger cars was 65.3 percent with 64.2 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 24 percent of the sample. The largest sample was for passenger cars with 56 percent followed by 10 percent each for vans and sport utility vehicles.

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 usage rate varied from 65 percent in the west region to 74 percent in the north with 71 percent in the east region.

Bicycle helmet use was only observed for 58 bicyclists. Only 14 of these bicyclists were wearing a helmet. This low rate (24 percent) shows the need for additional public information about this subject. This rate is higher than that found in previous years (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. A sample of 119,844 front seat occupants was obtained (including 93,182 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 54 to 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. The increase in usage continued in 2000 with a rate of 59.8 percent. The trend in usage rates from 1982 through 2000 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.

Kentucky had a statewide law requiring children under 40 inches in height to be placed in a child restraint prior to the law applying to all occupants and this law involves primary, rather than secondary, enforcement. The statewide usage rate for children under the age of four (including both the front and rear seat) was determined to be 87.2 percent in 2000. This compares to 89 percent in 1999 and 80 percent in 1998 and continues to show the high usage for this age group.

The motorcycle helmet law was repealed in 1998. There had been a very high compliance of the requirement to wear a helmet (over 95 percent), but the helmet usage percentage was reduced to 70 percent in 2000. While this rate was slightly higher than the 65 percent found in 1998, it still 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 (24 percent) but this percentage was higher than found in previous studies.

5.0 RECOMMENDATIONS

The data show that the level of safety belt usage in 2000 has continued the increase found in 1999 and is the highest since the start of the surveys in 1982. This increase can be related to efforts in the areas of both education and enforcement. Public information and education concerning the law and the reasons to wear safety belts should continue. Also, enforcement of the law, along with public information about this enforcement and resulting citations, should continued to be increased.

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.

The benefits which can be gained through education and enforcement of a secondary law is somewhat limited. The very high usage for children can be partially attributed to primary enforcement. To obtain the maximum possible 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 while they are in the permit and intermediate phase of the graduated license program.

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

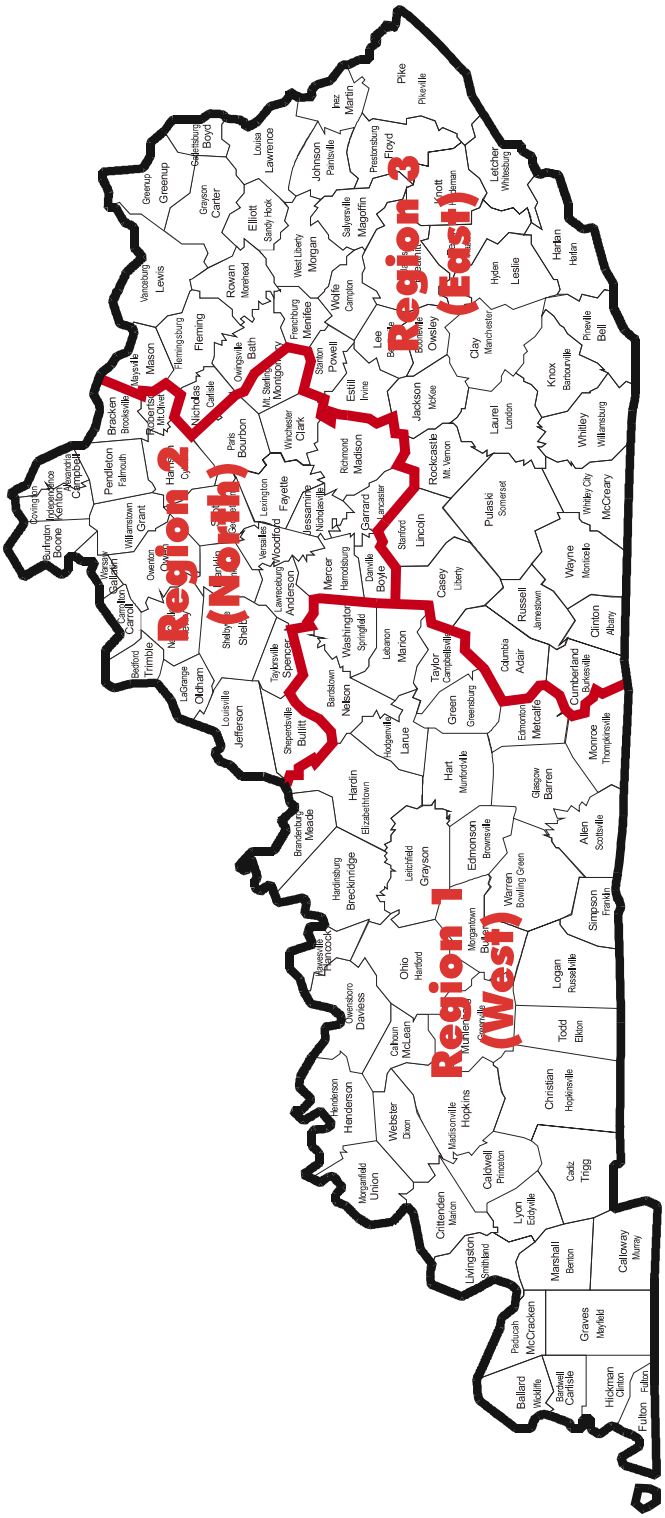

Table 1. SURVEY LOCATIONS

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	White Mills
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 Exit 10	Boston
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	Plano
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 458	Campbellsville
34	West	Rural Minor Collector/Local	Logan	KY 1038 at KY 103	Auburn
35	West	Rural Minor Collector/Local	Henderson	KY 1217 at KY 1299	Cairo
36	West	Rural Minor Collector/Local	Taylor	KY 527 at KY 3212	Campbellsville
37	West	Rural Minor Collector/Local	Logan	US 68X at US 79	Russellville
38	West	Rural Minor Collector/Local	Muhlenburg	US 62 at KY 189	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 Exit 136	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 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 Ave.	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 Rd.	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 US 41	Henderson
63	West	Urban Minor Arterial/Collector/Local	Calloway	KY 1327 at 16th	Murray
64	West	Urban Minor Arterial/Collector/Local	McCracken	US 45 at 13th St.	Paducah
65	West	Urban Minor Arterial/Collector/Local	McCracken	US 45X at Clay Ave. (6th)	Paducah
66	West	Urban Minor Arterial/Collector/Local	McCracken	KY 994 at US 60/62	Paducah
67	North	Rural Interstate	Clark	I-64 at Exit 98	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 113	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 116	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	Sadieville
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 3rd St.	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 99	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 St.	Louisville
123	North	Urban Principal Arterial	Fayette	Euclid Ave. at Upper St. (US 27)	Lexington
124	North	Urban Principal Arterial	Campbell	US 27 at KY 8 (4th St.)	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 Dr.	Lexington
127	North	Urban Principal Arterial	Jefferson	US 150 at 18th St.	Louisville
128	North	Urban Principal Arterial	Jefferson	KY 1934 at KY 1230	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 Ave.	Louisville
133	North	Urban Principal Arterial	Kenton	KY 16 at West 34th St.	Covington
134	North	Urban Principal Arterial	Campbell	KY 1120 at US 27	Ft. Mitchell
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 Dr.	Nicholasville
142	North	Urban Minor Arterial/Collector/Local	Jefferson	KY 864 at Breckinridge	Louisville
143	North	Urban Minor Arterial/Collector/Local	Boone	KY 3076 at Olympic Blvd.	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	Laurel	I-75 at Exit 49	Livingston

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 119 at Letcher Co. Line	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	Harlan
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	Dog Walk
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 2558 at KY 302	West Van Lear
183	East	Rural Minor Collector/Local	Whitley	KY 1595 at KY 92	Siler
184	East	Rural Minor Collector/Local	Adair	KY 2968 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	Sublimity City
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 Rd.	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	Pittsburg
198	East	Urban Minor Arterial/Collector/Local	Greenup	KY 705 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	70.3	71.4	61.8	69.5
Rural Principal Arterial	68.8	65.0	52.2	60.8
Rural Minor Arterial/Major Collector	52.4	59.1	43.1	50.7
Rural Minor Collector/Local	45.6	52.3	51.1	49.1
Urban Interstate/Freeway	68.8	69.0	61.6	68.8
Urban Principal Arterial	56.5	58.1	50.5	56.7
Urban Minor Arterial/Collector/Local	57.7	56.1	48.3	55.6
All	59.6	64.1	50.4	59.8

TABLE 3. USAGE RATE FOR DRIVERS

	PERCENT USAGE			
	REGION			
FUNCTIONAL CLASSIFICATION	WEST	NORTH	EAST	ALL
Rural Interstate	70.7	71.1	61.8	69.4
Rural Principal Arterial	69.2	65.7	53.4	61.6
Rural Minor Arterial/Major Collector	53.5	59.7	43.8	51.5
Rural Minor Collector/Local	44.3	53.4	52.5	49.4
Urban Interstate/Freeway	69.1	69.3	62.7	69.1
Urban Principal Arterial	57.1	58.3	51.9	57.1
Urban Minor Arterial/Collector/Local	58.9	57.1	48.9	56.6
All	60.1	64.4	51.3	60.3

TABLE 4. USAGE RATE FOR ALL FRONT SEAT PASSENGERS

	PERCENT USAGE			
	REGION			
FUNCTIONAL CLASSIFICATION	WEST	NORTH	EAST	ALL
Rural Interstate	68.9	72.5	62.0	69.8
Rural Principal Arterial	67.3	61.5	48.5	58.0
Rural Minor Arterial/Major Collector	48.2	55.7	41.6	47.7
Rural Minor Collector/Local	48.6	48.6	46.3	47.6
Urban Interstate/Freeway	67.3	66.9	58.8	66.8
Urban Principal Arterial	54.3	56.9	46.2	54.8
Urban Minor Arterial/Collector/Local	52.3	51.6	46.4	51.2
All	57.4	62.1	47.7	57.6

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	96.4	97.0	100.0	97.4
Rural Principal Arterial	96.8	93.6	74.2	86.1
Rural Minor Arterial/Major Collector	79.2	96.2	64.0	77.9
Rural Minor Collector/Local	91.8	81.0	70.5	81.0
Urban Interstate/Freeway	94.2	92.2	77.9	92.1
Urban Principal Arterial	92.1	86.7	80.0	87.2
Urban Minor Arterial/Collector/Local	85.7	89.3	65.1	85.5
All	89.8	91.7	73.8	87.2

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

* 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	73.3	77.8	69.7	75.3
Rural Principal Arterial	76.0	73.3	56.6	66.7
Rural Minor Arterial/Major Collector	62.2	64.7	51.9	59.1
Rural Minor Collector/Local	51.9	58.2	57.2	55.3
Urban Interstate/Freeway	74.9	70.9	67.0	71.3
Urban Principal Arterial	61.5	63.1	53.3	61.4
Urban Minor Arterial/Collector/Local	65.2	60.8	53.3	61.1
All	66.6	68.4	56.5	65.3
Pickup Trucks				
Rural Interstate	56.2	52.3	40.3	51.1
Rural Principal Arterial	50.6	53.5	38.4	45.5
Rural Minor Arterial/Major Collector	34.3	42.3	29.3	34.4
Rural Minor Collector/Local	26.5	31.0	37.9	32.0
Urban Interstate/Freeway	49.2	51.3	46.8	50.1
Urban Principal Arterial	39.0	38.2	34.8	37.9
Urban Minor Arterial/Collector/Local	40.0	38.3	31.4	37.9
All	41.9	45.9	35.5	42.5
Vans				
Rural Interstate	74.1	72.1	62.4	70.9
Rural Principal Arterial	71.7	57.2	62.7	65.7
Rural Minor Arterial/Major Collector	61.0	65.9	40.6	55.0
Rural Minor Collector/Local	59.2	55.0	53.3	56.0
Urban Interstate/Freeway	72.2	74.8	73.7	74.5
Urban Principal Arterial	59.8	61.3	59.8	60.7
Urban Minor Arterial/Collector/Local	62.8	58.3	59.2	59.6
All	65.5	67.5	55.0	64.2
Sport Utility Vehicles				
Rural Interstate	81.4	77.6	72.4	77.6
Rural Principal Arterial	76.5	64.7	62.9	68.8
Rural Minor Arterial/Major Collector	60.7	65.1	52.0	58.7
Rural Minor Collector/Local	53.3	67.1	59.5	58.4
Urban Interstate/Freeway	73.4	77.8	60.3	77.0
Urban Principal Arterial	61.5	63.3	63.3	62.9
Urban Minor Arterial/Collector/Local	64.4	61.0	52.8	61.0
All	67.2	70.8	59.8	67.4

APPENDIX A

COUNTY POPULATIONS AND NUMBER OF DATA COLLECTION SITES

COUNTY	POPULATION	NUMBER OF SITES	REGION*
Adair	15,360	1	3
Allen	14,628	0	1
Anderson	14,571	0	2
Ballard	7,902	0	1
Barren	34,001	8	1
Bath	9,692	0	3
Bell	31,506	2	3
Boone	57,589	9	2
Bourbon	19,236	0	2
Boyd	51,150	4	3
Boyle	25,641	2	2
Bracken	7,766	0	2
Breathitt	15,703	2	3
Breckinridge	16,312	1	1
Bullitt	47,567	3	2
Butler	11,245	0	1
Caldwell	13,232	0	1
Calloway	30,735	1	1
Campbell	83,866	5	2
Carlisle	5,238	0	1
Carroll	9,292	0	2
Carter	24,340	4	3
Casey	14,211	0	3
Christian	68,941	2	1
Clark	29,496	4	2
Clay	21,746	1	3
Clinton	9,135	0	3
Crittenden	9,196	0	1
Cumberland	6,784	0	3
Daviess	87,189	3	1
Edmonson	10,357	0	1
Elliott	6,455	0	3
Estill	14,614	0	3
Fayette	225,366	5	2
Fleming	12,292	0	3
Floyd	43,586	1	3
Franklin	43,781	2	2
Fulton	8,271	0	1
Gallatin	5,393	0	2
Garrard	11,579	0	2
Grant	15,737	1	2

COUNTY	POPULATION	NUMBER OF SITES	REGION*
Graves	33,550	1	1
Grayson	21,050	4	1
Green	10,371	0	1
Greenup	36,742	4	3
Hancock	7,864	0	1
Hardin	89,240	7	1
Harlan	36,574	3	3
Harrison	16,248	0	2
Hart	14,890	0	1
Henderson	43,044	3	1
Henry	12,823	0	2
Hickman	5,566	0	1
Hopkins	46,126	3	1
Jackson	11,955	0	3
Jefferson	664,937	20	2
Jessamine	30,508	3	2
Johnson	23,248	3	3
Kenton	142,031	7	2
Knott	17,906	0	3
Knox	29,676	1	3
Larue	11,679	0	1
Laurel	43,438	7	3
Lawrence	13,998	0	3
Lee	7,422	0	3
Leslie	13,642	0	3
Letcher	27,000	4	3
Lewis	13,029	0	3
Lincoln	20,045	2	3
Livingston	9,062	0	1
Logan	24,416	4	1
Lyon	6,624	0	1
McCracken	62,879	9	1
McCreary	15,603	0	3
McLean	9,628	0	1
Madison	57,508	0	2
Magoffin	13,077	0	3
Marion	16,499	2	1
Marshall	27,205	5	1
Martin	12,526	1	3
Mason	16,666	0	3
Meade	24,170	2	1

COUNTY	POPULATION	NUMBER OF SITES	REGION*
Menifee	5,092	0	3
Mercer	19,148	1	2
Metcalfe	8,963	0	1
Monroe	11,401	0	1
Montgomery	19,561	3	2
Morgan	11,648	0	3
Muhlenberg	31,318	3	1
Nelson	29,710	1	1
Nicholas	6,725	0	3
Ohio	21,105	0	1
Oldham	33,263	4	2
Owen	9,035	0	2
Owsley	5,036	0	3
Pendelton	12,036	0	2
Perry	30,283	2	3
Pike	72,583	2	3
Powell	11,686	0	3
Pulaski	49,489	2	3
Robertson	2,124	0	2
Rockcastle	14,803	1	3
Rowan	20,353	1	3
Russell	14,716	0	3
Scott	23,867	7	2
Shelby	24,824	3	2
Simpson	15,145	2	1
Spencer	6,801	0	2
Taylor	21,146	2	1
Todd	10,940	0	1
Trigg	10,361	0	1
Trimble	6,090	0	2
Union	16,557	0	1
Warren	76,673	3	1
Washington	10,441	0	1
Wayne	17,468	0	3
Webster	13,955	0	1
Whitley	33,326	4	3
Wolfe	6,503	0	3
Woodford	19,955	3	2
TOTALS	3,685,278	200	

* 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	4.0	2.4	5.5	1.9
Rural Principal Arterial	2.2	6.4	3.1	1.8
Rural Minor Arterial/Major Collector	4.3	4.1	5.7	2.7
Rural Minor Collector/Local	6.2	6.7	5.4	3.5
Urban Interstate/Freeway	2.7	1.6	7.1	1.4
Urban Principal Arterial	2.9	1.8	4.1	1.5
Urban Minor Arterial/Collector/Local	3.6	2.6	4.4	1.9
All	1.4	1.0	2.0	0.8

* 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	2.8	1.7	3.4	1.3
Rural Principal Arterial	1.5	4.2	1.6	1.1
Rural Minor Arterial/Major Collector	2.3	2.4	2.5	1.4
Rural Minor Collector/Local	2.8	3.5	2.8	1.7
Urban Interstate/Freeway	1.9	1.1	4.4	1.0
Urban Principal Arterial	1.6	1.0	2.1	0.9
Urban Minor Arterial/Collector/Local	2.1	1.5	2.1	1.1
All	0.8	0.8	1.0	0.5

* 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	307	74	6.7	4.9	214	74	93	72	18	78
2	241	79	6.5	5.2	165	79	76	79	4	100
3	96	78	10.6	8.3	60	77	36	81	1	100
4	293	63	8.7	5.5	219	64	74	59	2	100
5	881	74	3.9	2.9	586	75	295	71	0	N/A
6	503	81	4.2	3.4	351	80	152	82	5	100
7	523	80	4.3	3.5	366	78	157	83	8	100
8	417	63	7.3	4.6	284	63	133	63	10	80
9	376	72	6.3	4.5	304	72	72	71	1	100
10	750	48	7.4	3.6	613	49	137	45	17	88
11	1,056	63	4.6	2.9	797	63	259	61	9	89
12	743	64	5.3	3.4	567	64	176	66	18	100
13	342	74	6.3	4.7	311	73	31	81	5	100
14	353	68	7.2	4.9	307	68	46	67	2	100
15	289	73	7.0	5.1	230	75	59	66	2	100
16	522	73	5.2	3.8	384	73	138	74	2	100
17	516	62	6.8	4.2	420	61	96	65	11	91
18	798	63	5.4	3.4	546	63	252	61	12	83
19	944	69	4.3	3.0	736	69	208	65	20	100
20	418	69	6.4	4.4	280	69	138	70	9	67
21	573	45	9.1	4.1	461	46	112	40	7	86
22	243	51	12.3	6.3	203	52	40	48	5	100
23	649	40	9.4	3.8	477	39	172	41	10	100
24	227	72	8.1	5.8	176	70	51	78	6	100
25	419	65	7.0	4.6	351	65	68	69	7	100
26	576	48	8.6	4.1	463	50	113	39	6	67
27	1,368	47	5.6	2.6	1,045	49	323	41	20	90
28	299	48	11.7	5.7	231	49	68	46	2	100
29	1,338	43	6.2	2.7	1,021	45	317	38	34	85
30	377	49	10.2	5.0	280	47	97	56	2	50
31	265	43	13.7	6.0	200	45	65	38	3	100
32	263	58	10.2	6.0	210	59	53	57	5	80
33	1,043	41	7.3	3.0	789	41	254	39	23	74
34	68	32	34.4	11.1	48	33	20	30	2	50
35	96	51	19.6	10.0	72	50	24	54	1	100
36	268	49	12.2	6.0	212	47	56	55	9	100
37	945	41	7.6	3.1	725	43	220	36	33	91
38	398	48	10.1	4.9	273	46	125	54	5	100
39	26	46	41.5	19.2	20	50	6	33	0	N/A
40	31	26	59.7	15.4	20	30	11	18	3	0
41	457	74	5.4	4.0	359	75	98	71	8	88
42	600	77	4.4	3.4	439	77	161	75	10	100
43	305	58	9.6	5.5	259	60	46	43	2	100
44	648	66	5.5	3.6	454	65	194	69	4	100
45	625	67	5.5	3.7	430	68	195	66	9	89
46	544	72	5.2	3.8	388	72	156	72	5	100
47	1,639	71	3.1	2.2	1,201	69	438	78	22	91
48	493	62	6.9	4.3	342	61	151	65	9	100
49	887	53	6.2	3.3	736	55	151	42	21	81
50	1,514	48	5.3	2.5	1,149	48	365	46	24	96

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	936	55	5.8	3.2	701	57	235	51	22	95
52	1,406	52	5.0	2.6	1,097	53	309	48	24	96
53	383	57	8.7	5.0	285	56	98	59	7	86
54	1,519	57	4.4	2.5	1,046	57	473	56	14	93
55	1,232	52	5.3	2.8	958	54	274	48	26	96
56	1,065	64	4.5	2.9	829	65	236	60	22	95
57	717	60	6.0	3.6	591	62	126	52	17	88
58	494	48	9.2	4.4	373	50	121	43	13	92
59	95	65	14.7	9.6	75	63	20	75	2	100
60	413	52	9.2	4.8	333	53	80	49	5	80
61	270	42	14.0	5.9	215	44	55	36	9	89
62	279	65	8.6	5.6	226	67	53	58	7	86
63	465	51	8.8	4.5	347	52	118	49	12	42
64	475	59	7.6	4.4	377	59	98	58	11	100
65	374	62	7.9	4.9	294	63	80	58	3	100
66	444	54	8.7	4.6	364	54	80	54	7	86
67	469	78	4.7	3.7	312	78	157	79	4	100
68	677	65	5.6	3.6	533	65	144	62	17	94
69	464	77	5.0	3.8	362	77	102	77	5	100
70	410	69	6.6	4.5	324	68	86	71	3	100
71	380	64	7.5	4.8	312	67	68	53	5	100
72	426	78	5.1	3.9	340	77	86	81	1	100
73	184	73	8.7	6.4	144	73	40	75	8	88
74	681	73	4.6	3.3	520	72	161	75	14	100
75	258	53	11.4	6.1	203	50	55	67	0	N/A
76	552	71	5.4	3.8	439	69	113	76	6	100
77	952	76	3.6	2.7	656	77	296	75	18	89
78	257	82	5.8	4.7	198	82	59	81	5	100
79	1,137	57	5.1	2.9	932	57	205	53	8	75
80	526	63	6.5	4.1	440	65	86	55	7	86
81	543	54	7.8	4.2	425	56	118	48	11	91
82	136	69	11.2	7.8	113	69	23	70	7	100
83	668	58	6.4	3.7	546	58	122	57	12	83
84	672	56	6.7	3.8	530	55	142	58	12	100
85	258	65	9.0	5.8	182	68	76	58	2	100
86	265	65	8.9	5.8	201	64	64	67	8	100
87	469	53	8.5	4.5	380	53	89	53	13	92
88	665	63	5.8	3.7	552	65	113	54	18	94
89	92	52	19.6	10.2	69	54	23	48	3	67
90	195	46	15.2	7.0	146	49	49	39	0	N/A
91	201	42	16.1	6.8	146	45	55	35	2	100
92	536	44	9.6	4.2	398	44	138	42	12	83
93	93	53	19.3	10.1	80	54	13	46	0	N/A
94	731	69	4.8	3.3	642	70	89	61	12	100
95	290	37	15.2	5.5	210	41	80	25	5	60
96	44	27	48.2	13.2	29	28	15	27	3	67
97	428	49	9.7	4.7	344	49	84	50	8	88
98	188	52	13.8	7.1	151	52	37	49	4	75
99	56	54	24.4	13.1	42	55	14	50	0	N/A
100	322	60	8.9	5.4	263	60	59	58	9	89

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	211	44	15.2	6.7	159	45	52	40	5	100
102	1,357	65	3.9	2.5	1,129	64	228	65	29	93
103	1,000	76	3.5	2.6	860	75	140	81	23	100
104	689	74	4.4	3.3	629	74	60	82	7	86
105	764	60	5.8	3.5	591	61	173	54	21	90
106	864	63	5.1	3.2	675	62	189	68	25	96
107	1,271	77	3.0	2.3	870	78	401	75	28	79
108	650	63	5.9	3.7	502	65	148	57	5	80
109	581	78	4.4	3.4	501	78	80	75	8	88
110	758	69	4.8	3.3	667	70	91	62	9	89
111	836	73	4.2	3.0	780	73	56	66	10	100
112	560	59	6.9	4.1	423	59	137	61	7	100
113	902	80	3.3	2.6	601	80	301	80	4	100
114	731	62	5.7	3.5	606	62	125	61	10	100
115	1,293	69	3.6	2.5	1,077	69	216	73	17	100
116	913	70	4.3	3.0	741	70	172	70	24	96
117	855	66	4.8	3.2	662	66	193	66	8	100
118	548	63	6.5	4.1	473	63	75	61	7	71
119	453	72	5.8	4.2	359	72	94	71	2	100
120	650	56	6.8	3.8	484	56	166	57	5	100
121	1,271	56	4.9	2.7	1,001	55	270	60	17	88
122	590	52	7.7	4.0	483	52	107	50	6	67
123	830	64	5.1	3.3	717	66	113	50	4	100
124	897	49	6.7	3.3	732	49	165	50	24	88
125	614	53	7.5	3.9	482	55	132	45	7	86
126	1,479	77	2.8	2.2	1,231	76	248	80	19	95
127	621	57	6.9	3.9	559	57	62	55	0	N/A
128	736	48	7.5	3.6	629	50	107	37	1	100
129	1,063	66	4.3	2.8	922	66	141	65	21	100
130	2,042	51	4.3	2.2	1,621	50	421	52	32	66
131	1,138	56	5.1	2.9	876	57	262	53	14	86
132	1,083	62	4.6	2.9	899	63	184	57	4	100
133	1,007	49	6.3	3.1	788	48	219	53	12	92
134	480	56	7.9	4.4	410	56	70	60	42	93
135	743	57	6.3	3.6	582	57	161	57	19	95
136	1,312	50	5.4	2.7	1,035	52	277	42	16	94
137	863	63	5.1	3.2	738	63	125	60	12	83
138	896	59	5.5	3.2	699	58	197	61	13	100
139	362	53	9.7	5.1	293	52	69	58	2	100
140	951	54	5.8	3.2	784	56	167	44	11	91
141	1,007	45	6.9	3.1	808	46	199	39	13	92
142	435	51	9.3	4.7	342	53	93	43	7	100
143	633	69	5.3	3.6	543	69	90	63	8	88
144	1,095	56	5.2	2.9	889	55	206	61	69	93
145	316	55	9.9	5.5	266	58	50	42	10	100
146	300	50	11.2	5.7	230	51	70	49	6	83
147	552	55	7.6	4.2	449	55	103	52	0	N/A
148	973	40	7.8	3.1	775	42	198	30	28	93
149	312	57	9.6	5.5	236	56	76	59	4	100
150	77	65	16.4	10.7	61	67	16	56	0	N/A

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	312	73	6.8	4.9	219	74	93	71	2	100
152	387	67	6.9	4.7	289	65	98	73	6	100
153	372	63	7.8	4.9	265	65	107	59	10	100
154	269	65	8.8	5.7	193	65	76	64	2	100
155	767	50	7.0	3.5	595	52	172	45	17	76
156	710	60	6.0	3.6	501	58	209	64	9	78
157	402	48	10.2	4.9	262	48	140	48	3	67
158	762	51	7.0	3.5	579	53	183	45	5	40
159	218	49	13.5	6.6	154	49	64	48	3	33
160	468	48	9.4	4.5	341	50	127	45	11	73
161	762	54	6.6	3.5	598	55	164	48	10	90
162	687	49	7.6	3.7	490	51	197	46	21	62
163	493	54	8.2	4.4	359	54	134	53	20	70
164	1,099	47	6.2	3.0	833	48	266	45	14	86
165	309	58	9.5	5.5	224	58	85	56	5	80
166	792	53	6.5	3.5	595	56	197	45	24	83
167	242	38	16.1	6.1	180	38	62	39	8	75
168	278	41	14.1	5.8	189	42	89	38	11	55
169	200	38	17.7	6.7	155	37	45	40	8	50
170	193	56	12.5	7.0	140	54	53	62	1	100
171	170	41	18.0	7.4	115	42	55	40	1	100
172	177	44	16.8	7.3	121	45	56	39	0	N/A
173	272	38	15.1	5.8	189	39	83	37	9	67
174	845	44	7.6	3.3	641	43	204	47	20	75
175	122	45	19.6	8.8	95	39	27	67	5	80
176	302	49	11.6	5.6	228	49	74	47	5	40
177	351	48	10.8	5.2	291	50	60	42	4	75
178	122	50	17.7	8.9	87	48	35	54	5	100
179	72	40	28.1	11.3	57	44	15	27	1	100
180	308	47	11.9	5.6	242	49	66	38	4	50
181	53	43	30.7	13.3	38	45	15	40	0	N/A
182	60	35	34.5	12.1	46	33	14	43	0	N/A
183	88	47	22.4	10.4	60	50	28	39	4	50
184	45	33	41.3	13.8	36	33	9	33	0	N/A
185	246	42	14.6	6.2	187	42	59	42	4	75
186	808	56	6.2	3.4	640	56	168	54	18	83
187	443	62	7.3	4.5	316	63	127	59	17	76
188	544	58	7.2	4.2	416	59	128	55	9	100
189	885	47	6.9	3.3	653	49	232	43	23	78
190	1,580	58	4.2	2.4	1,206	58	374	61	17	76
191	1,556	54	4.6	2.5	1,118	54	438	56	11	100
192	1,354	59	4.4	2.6	1,032	59	322	61	17	88
193	1,147	56	5.1	2.9	908	56	239	56	17	88
194	876	52	6.3	3.3	698	55	178	42	16	75
195	672	46	8.2	3.8	502	48	170	39	21	71
196	459	53	8.6	4.6	363	53	96	53	9	89
197	1,157	56	5.2	2.9	885	56	272	54	15	80
198	517	47	9.2	4.3	413	48	104	43	19	100
199	831	47	7.2	3.4	662	47	169	46	12	50
200	1,152	49	5.9	2.9	858	52	294	40	19	95

* (using 0.95 probability)