

# 2012 National Survey of Bicyclist and Pedestrian Attitudes and Behavior

## Volume 3: Methodology Report



U.S. Department of Transportation  
**National Highway Traffic Safety  
Administration**



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16. Abstract  The 2012 National Survey of Bicyclist and Pedestrian Attitudes and Behavior is the second survey on this topic conducted for the National Highway Traffic Safety Administration (NHTSA). Data collection was conducted by Abt SRBI, Inc, a national research organization. The survey utilized an overlapping dual frame (landline and cell) sample design and included an oversample of 16-39 year olds. A total of 7,509 interviews were conducted with persons 16 years of age or older living in the United States. Interviewing began on July 12, 2012, and ended on November 18, 2012. The samples were combined and weighted to produce national estimates of the target population. This report presents detailed information on the survey methodology, as well as the full survey instrument.			
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## **1. Introduction**

The goal of the 2012 National Survey of Bicyclist and Pedestrian Attitudes and Behavior (NSBPAB) was to obtain a “snapshot” of the attitudes and behaviors with regards to bicycling and pedestrian activities of the U.S. population using a telephone survey of respondents aged 16 years and older. The previous administration of the NSBPAB was conducted in 2002. Only surveys based on probability samples can be used to create mathematically sound statistical inferences about a larger target population. Most statistical formulas for specifying the sampling precision (estimates of sampling variance), given particular sample sizes, are premised on simple random sampling. However, random sampling requires an enumeration of all of the elements in the population. Since no enumeration of the total population of the United States (or its subdivisions) is available, all surveys of the general public are based upon complex sample designs that may employ stratification and two or more stages of sampling.

A sampling design using geographic stratification (NHTSA Region), an oversample of young drivers, sampling frames of households with landlines and cell phones, together with an overall sample size of 7,500 was developed and implemented for this survey. The final sample consisted of 7,509 respondents, which included an oversample of 508 participants ages 16-39, with 35.6 percent of respondents coming from cell phone only or cell phone mostly households. Weights were developed to yield national estimates of the target population within specified limits of expected sampling variability. This report describes the methods of sample construction and survey administration, and shows the sample dispositions for each of the three samples and computation of weights.

## **2. Sample Construction**

The 2012 National Survey of Bicyclist and Pedestrian Attitudes and Behavior, like the 2002 survey, was conducted by telephone. Hence, the study procedures called for the construction of a national sampling frame of telephone households from which a random population sample could be derived. For the selection of the sample, two sampling frames were employed, the landline RDD sampling frame and the cell phone sampling frame.

The procedure for developing a population-based sample for this telephone survey in each of the two frames involved four stages. The first stage sample involved using a population-based sample allocation, distributed in proportion to the geographic distribution of the target population according to the most recent Census estimates. The second stage employed a systematic selection of assigned telephone banks with the geographically stratified first stage sample design. The third stage used a random digit dialing (RDD) sampling of telephone households within the telephone banks selected in the second stage. The fourth stage required the identification and systematic selection of one eligible respondent within each sampled household so that the household sampling frame yielded a representative sample of the eligible population. These procedures yielded national estimates of the target population, with specified limits of expected sampling variability, from which valid generalizations can be made to the general public.

### **2.1. Stratification**

Both the landline and cell phone samples were national probability samples of telephone blocks from each sampling frame, and were stratified based on NHTSA region. The target population specified for this study was people 16 and older in the United States. Consequently, the initial stage in the construction of this sample required the development of a national probability sample of the non-institutionalized adult population of the United States.

The estimated distribution of the population by stratum was calculated on the basis of the U.S. Census

Bureau's 2010 Census. The population estimates were taken for the population age 16 and older. Based on these Census estimates of the geographic distribution of the target population, the total sample was proportionately allocated by stratum.

The geographic location of the sampled hundreds banks in list-assisted RDD sample was based on the dominant ZIP code for listed numbers within the bank. Since there are no listed numbers for cell phones, the geographic location assigned to cell phone banks was based on the address of the billing center for each user. This leads to a significant misclassification of the location of cell phone households at the community level, but very little at the State level since billing centers are located in the same State as the household being served. Hence, the geographic stratification by NHTSA region was effective for both the landline and cell phone components of the dual frame design.

**Figure 2.1. NHTSA Regional Population for Ages 16+: 2010**

<b>Proportion</b>		<b>Population</b>	
		243,275,505	100.00%
Region I	CT, ME, MA, NH, RI, VT	11,689,003	4.80%
Region II	NJ, NY, PA	22,565,293	9.28%
Region III	DE, DC, MD, VA, WV	23,948,053	9.84%
Region IV	AL, FL, GA, KY, MS, NC, SC, TN	48,479,089	19.93%
Region V	IL, IN, MI, MN, OH, WI	40,775,536	16.76%
Region VI	AR, LA, NM, OK, TX	29,388,960	12.08%
Region VII	IA, KS, MO, NE	10,757,111	4.42%
Region VIII	CO, MT, ND, SD, UT, WY	8,326,600	3.42%
Region IX	AZ, CA, HI, NV	37,224,338	15.30%
Region X	AK, ID, OR, WA	10,121,522	4.16%

Source: U.S. Bureau of the Census, 2010 Census Demographics by State

## 2.2. Landline Random Digit Dialing (RDD) Sample

Once the sample was geographically stratified with sample allocation proportionate to population distribution, a sample of assigned telephone banks was randomly selected from an enumeration of the Working Residential Hundred Blocks within the active telephone exchanges within the region. The Working Hundreds Blocks were defined as each block of 100 potential telephone numbers within an exchange that included one or more residential listings.

A two-digit number was randomly generated by computer for each Working Residential Hundreds Block selected. This is known as list-assisted random digit dialing (RDD). Every telephone number within the Working Residential Hundreds Block has an equal probability of selection, regardless of whether it is listed or unlisted.

The RDD sample of telephone numbers was dialed to determine which numbers were working residential household telephone numbers. Non-working numbers and non-residential numbers were immediately replaced by other RDD numbers selected within the same stratum in the same fashion as the initial number. Ineligible households (e.g., no eligible respondent in the household, language barriers) were also replaced. Non-answering numbers were not replaced until the maximum number of call attempts was reached. However, one or more open numbers per case was permitted in order to permit the data collection to be completed within a reasonable period.

The systematic dialing of those numbers to obtain a residential contact yielded a probability sample of

landline telephone households.

### **2.3. Oversample for 16- to 39-Year-Olds From the Landline Frame**

The population prevalence of the target age group 16-39 years old is not large enough to generate the desired sub-sample size, given a total sample of 7,509 for the survey. Based upon the 2010 Census approximately 34 percent of the U.S. population is between 16 and 39 years old. However, when standard RDD sampling with landline telephones was conducted for the 2012 NSBPAB, less than 18 percent of the final sample was between 16 and 39. This is due to the rise in cell phones among those under 39 as well as the fact that it is more difficult to survey people in the 16-20 age group, who may be under-represented because they live in a group quarters (e.g., dormitory) setting. Hence, a simple proportionate sample of the adult population would not meet the needs of this study design. The 16- to 39-year-old age group is of particular interest to NTHSA, and this required a boost in the numbers of respondents who fell into this age range. Consequently, persons in age groups 16-39 were over-sampled.

Although the dual frame sample could correct the underrepresentation of the 16- to 39-year-old cohort in total sample, a small oversample was employed to ensure a large subsample of 16- to 39-year-olds in the final sample. Hence, an independent landline sample was drawn and a separate script was programmed to screen for households with 16- 39-year-olds present and select one of the age-eligible persons in the household for the interview. We obtained 740 interviews with 16- to 39-year-olds out of 4,789 in the cross-sectional landline sample, 508 from the landline oversample, and 1,154 from the cell phone sample. This brought the sample size of completed interviews for this 16- to 39-year-old age group to 2,402 or 32 percent of the total sample.

### **2.4. Sampling of Cellular Telephone Numbers**

Although list-assisted landline RDD sampling provides only a small coverage error for telephone households within landline banks, the restriction of the sampling frame to only landline banks introduces a much more serious coverage error in general population surveys. The increasing percentage of households that have abandoned their landline telephones for cell phones over the past decade has significantly eroded the population coverage provided by landline-based surveys. Cell phone only households are not covered by current RDD landline sampling procedures, which exclude telephone exchanges and 1,000 banks used exclusively for cell phones. Furthermore, these are some of the same groups that are increasingly under-represented in current RDD landline telephone surveys due to differential non-response, so it is very important to include cell phone only households in the sample.

Landline only adults were covered by the landline sample frame as were adults that have dual telephone service – landline and cellular telephone service. Although cell phone only households were excluded from landline samples, dual service respondents were underrepresented in landline surveys. As discussed below, some dual telephone service households were much more likely to be reached in a cell phone sample than in a landline RDD sample.

Regardless of the specific type of dual frame design selected for a study, a cell phone only segment was required. Due to the significantly higher cost of the cell phone interviews compared to the landline interviews, dual frame surveys are usually designed with optimal allocation of sample between the landline and cell phone strata, rather than simply using a proportional allocation.

### **2.5. Sample of Cell-Mostly Households**

Cell-mostly households appeared in both the landline and cell phone samples. In total, 2,212 interviews were completed with the cell phone sample. Of these, 1,669 were completed with cell

phone only households, meaning no landline was present in the household, and 543 were completed with cell phone mostly households, or households who receive all or almost all calls on their cell phone despite having a working landline in their home as well. In the landline sample, 1,085 interviews were completed with households who identified themselves as cell phone mostly. The inclusion of the cell phone mostly households from the cell phone sample reduces the cost differential between landline and cell phone interviews while providing better coverage of populations underrepresented, if not excluded, from landline samples.

**Figure 2.2. Sample Counts by Age from the Two Frames**

<b>Sample Type</b>	<b>Age 16-39</b>	<b>Age 40 +</b>	<b>Age Unknown</b>	<b>TOTAL</b>
Landline RDD	740	4,001	48	4,789
Cell Phone RDD	1,154	1,048	10	2,212
Landline Oversample	508	0	0	508
<b>TOTAL</b>	<b>2,402</b>	<b>5,049</b>	<b>58</b>	<b>7,509</b>

### **3. Questionnaire Development**

#### **3.1 Cognitive Testing**

Although the 2012 questionnaire was largely based on the 2002 questionnaire for consistency and comparability across the two surveys, there were enough significant changes to warrant cognitive testing of the 2012 survey instrument. Consequently, cognitive interviews were conducted using the 2012 survey instrument to measure how respondents might interpret and respond to new or revised questions. The cognitive testing process involved a series of standardized probes that were introduced at specified points in the draft questionnaire. The objective was to identify any questions or response categories which could pose problems for respondents with encoding, recall or the decision process prior to the full implementation of the survey.

A total of nine one-on-one cognitive interviews were conducted on March 16, 2012, with persons selected from the general public. The cognitive interviews were conducted at the Cognitive Interview Lab at Abt Associates in Bethesda, MD. These interviews were conducted by professional interviewers under the direction of Johnny Blair, the Director of the Abt Cognitive Lab. The COTR and two other DOT staff members came to observe four of the nine interviews from a separate viewing room which had TV monitors set up for this purpose.

The cognitive testing of the survey instrument was performed by adding probes at various points during the interview, designed to measure respondents' understanding of the questions and the response options. Illustrative probes used in the cognitive testing included the following:

- Please restate this question in your own words
- What does .....mean to you?
- Are there any other answer categories I should have provided?
- Is there another term we should use?
- What type of answer did you think I was looking for?
- Was this question difficult to answer?
- How did this question differ from a previous question?
- What part of the question did you focus on when you came up with your answer?

Respondents indicated a basic level of understanding of the questions asked and were able to accurately rephrase questions when probed. The same was true when respondents were asked if they understood specific words and phrases. Overall, the survey instrument worked very well among respondents. The majority of revisions which were made as a direct result of the cognitive testing included adding new response options to specific questions. For example, “Rental Spot” was added to the Origin and Destination question for bicyclists.

### **3.2 Survey Pretest**

A survey pretest was conducted on July 11, 2012, with 15 respondents. The pretest served as a “dress rehearsal” and tested the survey systems, in addition to testing the instrument and CATI programming. The pretest of the survey instrument also evaluated the wording of questions and response categories in terms of clarity and confusion for respondents via telephone administration; assessed the flow of the interview, including question sequencing and skip patterns; determined the time required to administer the questionnaire over the telephone; helped gauge item non-response to sensitive questions; ensured that a smooth interview occurred with previous information guiding later questions; ensured random rotation of specified questions; checked that invalid responses were not entered; and reviewed and evaluated the full range of procedures.

No significant changes to the questionnaire were made as a result of the pretest, and the main data collection was approved to go forward the following day.

## 4. Survey Administration

### 4.1. Advance Letter

An advance letter was sent out to respondents who had an address match from Survey Sampling Inc. (SSI). The advance letter did not have an impact on the cooperation, response rate, or refusal rate, and was discontinued after being mailed out to approximately 10,000 households. The letter is shown in Figure 4.1 below.

**Figure 4.1. Advance Letter to household with an Address Match**

<<DATE>>
NAME ADDR1 ADDR2 CITY, ST ZIP
Dear NAME:
I am contacting you on behalf of the National Highway Traffic Safety Administration (NHTSA) of the U.S. Department of Transportation. NHTSA has contracted with Abt SRBI to conduct a national study on bicyclist and pedestrian behavior. I have sent this letter to alert you that an interviewer from Abt SRBI will be calling in the near future to request that a member of your household participate in the survey. NHTSA is conducting the survey in order to identify current issues and obstacles that people have in being able to walk and bicycle outdoors. The information obtained will be used to provide guidance to programs across the country that seek to improve pedestrian and bicyclist safety.
The interviewer will ask to interview one member of your household that the interviewer will select randomly. This random selection is necessary in order to produce national estimates. The interview takes only about 20 minutes to complete. It is voluntary and the person being interviewed doesn't have to answer any questions that he or she doesn't want to answer. The interviewer will not collect information that could be used later to identify the person who provided the responses.
NHTSA has placed a link on its web site ( <a href="http://www.nhtsa.gov/pedbikesurvey">www.nhtsa.gov/pedbikesurvey</a> ) where prospective survey participants can confirm this is a government-sponsored survey. The survey has been reviewed and approved by the U.S. Office of Management and Budget. The OMB control number is 2127-0684.
Your household's participation in this survey would be a big help to NHTSA in its continuing efforts to improve safety for bicyclists and pedestrians, as well as to the many others across the country who use this information to design their own safety programs and community improvements. I hope you will agree to participate.
Sincerely,
Paul B. Schroeder Vice President Abt SRBI, Inc

## **4.2. Calling Protocol**

Initial telephone contact was attempted during the hours of the day and days of the week that have the greatest probability of respondent contact. The primary interviewing period was from 5:30 p.m. to 9:30 p.m. on weekdays, 9 a.m. to 9:30 p.m. on Saturdays, and from 10 a.m. to 9:30 p.m. on Sundays (all times are listed as local times). Since interviewing was conducted across time zones, the interviewing shift lasted until 12:30 a.m. Eastern (9:30 p.m. Pacific Time).

If the interview was not conducted at the time of the initial contact, the interview was rescheduled at a time convenient to the respondent. Although initial contact attempts were made on evenings and weekends, daytime interviews were scheduled when necessary. If four telephone contacts on the night and weekend shifts did not result in a completed interview, the fifth contact was attempted on a weekday during the daytime.

Interviewers attempted a maximum of 10 calls to each landline telephone number in order to reach a person within the household. When the household was reached, the interviewer asked to speak to someone 16 years old or older. If there was more than one person in the household who was 16 years old or older, one of the eligible adults was selected by designating the adult who had the most recent birthday, or who was going to have the next birthday (this condition was randomized within the CATI program), as the target respondent. When the target respondent was reached, but an interview at that time was inconvenient or inappropriate, interviewers set up appointments with respondents. When contact was made with the household, but the target respondent was unavailable, interviewers probed for appropriate callback times for an appointment. After a household was reached, the maximum number of call attempts was raised to 15.

For cell phone respondents, interviewers attempted a maximum of five calls to each number for it to be deemed a permanent no answer. If contact was made with a respondent, a maximum of 10 call attempts were made. Unlike the landline numbers, cell phones were treated as a personal device, hence there was no respondent selection performed. If the person answering the cell phone was 16 years old or older, they were deemed eligible for the interview. Prior to asking the person's age, all cell phone respondents were first asked if they were currently driving and if they were in a safe place to talk. If the respondent was driving or in an unsafe place to use a cell phone, the interviewer thanked the respondent and hung up the phone, noting the time of the call so the respondent would not be reached at the same time on the subsequent attempt. Respondents who completed the interview on their cell phones were offered a \$10 remuneration to account for limited calling plans.

## **4.3. Spanish Language Interviews**

A Spanish language version of the survey instrument was developed in order to eliminate language barriers for a small proportion of the U.S. adult population. The questionnaire was translated into Spanish by a professional translation firm. The Spanish questionnaire was then reviewed next to the English questionnaire by a different translator and checked for errors. Any translations that were not comparable were revised to be in line with the intent of the English questionnaire.

If the interviewer encountered a language barrier during the initial contact, either with the person answering the phone or with the designated respondent, the interviewer thanked the person and terminated the call. If the case was designated as Spanish language, it was turned over to the next available Spanish-speaking interviewer.

All households which were designated as "Foreign Language-Spanish" were assigned to a Spanish-speaking interviewer. These bilingual interviewers re-contacted each Spanish-speaking household to screen for eligibility and conducted the interview with the target respondent. Less than 3 percent (2.4%) of the completed interviews were conducted in Spanish.

#### **4.4. Answering Machines**

Abt SRBI implemented a plan for increasing participation from persons in households where telephone contact was made with an answering machine or voice mail. The strategy for handling answering machines with a 15-call protocol needed to balance the objectives of reaching the household and avoiding unnecessary annoyance of the household. Abt SRBI was responsible for maintaining a toll free number where the respondent could call, as well as placing a description of the study on the Abt SRBI website for respondents. In addition, NHTSA placed a statement on its website that the prospective survey participant could access by Internet to verify the legitimacy of the survey. In order to evaluate the value of these steps, survey respondents were asked as part of the interview whether they used the toll free number or the NHTSA Web site.

#### **Figure 4.2. Final Voicemail/Answering Machine Script**

I am calling on behalf of the U.S. Department of Transportation. We are conducting a national study on bicycle and pedestrian safety. The interview will only take about 20 minutes. This is not a sales call. Please call us at **1-866-780-8528** between 5 p.m. and 12 a.m. Eastern time. Ask for study number **5432**. For more information about the study please visit [www.nhtsa.gov/pedbikesurvey](http://www.nhtsa.gov/pedbikesurvey). Thank you very much.

#### **4.5 Monitoring of Telephone Interviewers**

Each interviewer was monitored throughout the course of the project. The monitor evaluated the interviewer on his or her performance. The monitor discussed any problems that an interviewer was having with the shift supervisor. All interviewers on the project underwent two types of monitoring. The study monitor sat at a computer where he/she could see what the interviewer had recorded, while audio-monitoring the interview. The audio-monitoring allowed the supervisor to determine the quality of the interviewer's performance in terms of:

- 1) Initial contact and recruitment procedures;
- 2) Reading the questions, fully and completely, as written;
- 3) Reading response categories, fully and completely, (or not reading them) according to study specifications;
- 4) Whether or not open-ended questions were properly probed;
- 5) Whether or not ambiguous or confused responses were clarified;
- 6) How well questions from the respondent were handled without alienating the respondent or biasing his/her response;
- 7) Avoiding bias by either comments or vocal inflection;
- 8) Ability to persuade wavering, disinterested or hostile respondents to continue the interview; and
- 9) General professional conduct throughout the interview.

The supervisor also monitored the interviewer's recording of survey responses; the supervisor's screen emulated the interviewer's screen. Consequently, the supervisor was able to see whether the interviewer entered the correct code, number or verbatim.

#### **4.6 Refusal Conversion**

The process of converting terminations and refusals, once they had occurred, involved the following steps. First, there was a diagnostic period, when refusals and terminations were reported to the

Operations Manager on a daily basis. The Project Director reviewed these as well to see if anything unusual was occurring. Second, after enough time had passed to see enough refusals and terminations, the Project director and his staff developed a refusal conversion script. Third, the refusal conversion effort was fielded with re-interview attempts scheduled about a week after the initial refusal. Fourth, the Project Director and Operations Manager received the outcomes of the refusal conversion efforts. Minor revisions to the script and the procedures were made, as needed.

#### 4.7 Field Outcomes

Survey data collection by the Federal Government requires prior approval by the Office of Management and Budget (OMB). NHTSA published a Notice in the Federal Register soliciting comments on the information collection. The Notice appeared in the Federal Register on June 13, 2011 (Vol. 76, No. 113, pp 34290-34291). NHTSA then submitted the request for data collection to OMB. OMB approved the information collection on July 2, 2012, assigning it the OMB number 2127-0684 with an expiration date of July 31, 2015. The Abt SRBI IRB (FWA 0000580) reviewed and approved this study on June 9, 2012.

The field interviewing for the study commenced on July 12, 2012, following the training of the field interviewers, and was completed on November 18, 2012. There was a period of interruption from October 30, 2012, through November 8, 2012, to reduce the burden on respondents who were receiving many phone calls from political campaigns, since 2012 was a Presidential election year. This extended the field period by almost 2 weeks, however, it was warranted given the respondent burden concerns.

A total of 7,509 interviews were conducted for the survey, including 4,789 interviews for the landline RDD cross-section, 2,212 for the cell RDD sample, and 508 for the 16-39 year old landline oversample. The average interview length for the interview was 17.9 minutes for the landline RDD cross-section, 21.7 minutes for the cell phone RDD, and 18.9 minutes for the landline RDD oversample.

#### 5. Response Rates

Response rates were calculated independently for each sample: landline cross-section, cell phone sample, and the landline oversample. For the purposes of analysis and weighting, cases from the oversample who reported they were over 39 years old in the demographics were moved to the landline cross-section sample. However for the purposes of calculating response rate for each sample, these cases were left in the oversample, hence the sample totals in Figure 5.1 do not match the totals for sample type which are shown elsewhere in this report. For sample dispositions and details on how the response rate was calculated please refer to Appendix A: Sample Dispositions.

**Figure 5.1 Response Rates by Sample Type**

Sample Type	Total Numbers Dialed	Final N	Response Rate
Landline Cross-section	88,655	4,503	25.32%
Cell Phone	46,998	2,212	13.81%
Landline Oversample	57,386	794	22.99%

#### 6. Weighting and Estimation

In order to produce population-based estimates while conducting statistical analyses on the data, each respondent in the survey is assigned a sampling weight. The weights for the 2012 NSBPAB were calculated in three steps: 1) calculating design weights for the cell sample, landline sample, and the 16-39

landline oversample, 2) adjusting the weights of persons who are in both the landline frame and the cell frame, and 3) population calibration (i.e., post-stratification and raking of weights).

### 6.1. Design Weights

The first stage in the weighting process involved creating sampling weights that correct for disproportionate probabilities of selection, or *design weights*. The design weight for a sampling unit is the inverse of the probability that the particular unit is drawn into the sample. For the 2012 NSBPAB, the design weight was calculated using the following steps:

#### Landline Sample

The initial design weight is the inverse of the probability of selection of the landline telephone number of the responding household. Since the sample of telephone numbers is stratified by the ten NHTSA regions, the sampling weights are computed within each stratum.

Let  $N_{lh}$  be the number of phone numbers in phone banks with one or more directory-listed landline phone numbers in stratum  $h$ . Let  $n_{lh}$  be the numbers of phone numbers selected from these banks and dialed. The sampling weight for households selected in that stratum is

$$W_{lh} = \frac{N_{lh}}{n_{lh}}$$

In addition to the sample of  $n_{lh}$  telephone numbers, an additional sample of  $n_{oh}$  telephone numbers was selected from the population of telephone numbers to screen and identify households with persons who are 16-39 years old. This means persons who are 16-39 had two chances of selection. Either they could be selected in the landline cross-section sample or the oversample. Based on this probability of selection, the design weight of households with 16- to 39-year-olds in stratum  $h$  is

$$W_{loh} = \frac{N_{lh}}{n_{lh} + n_{oh}}$$

Hence, there are two sets of weights for selected household in each landline stratum. One set of weights for those households with 16- to 39-year-olds and a second set for those households having persons outside this age range.

#### Cell Phone Sample

If the number of cell telephone numbers selected from a population of  $N_{ch}$  numbers is  $n_{ch}$  then the design weight for persons selected through cell phone sampling stratum  $h$  is

$$W_{ch} = \frac{N_{ch}}{n_{ch}}$$

The sampling weights for households selected in the landline frame and persons selected from the cell frame are given in Figure 6.1.

**Figure 6.1. Frame and Sample Counts by NHTSA Region**

NHTSA Region	Landline Frame					Cell Frame		
	Frame (N <sub>L</sub> )	Sample size		Design weight (W1)		Frame (N <sub>C</sub> )	Sample size (n <sub>C</sub> )	Design weight (W1)
		Base sample (n <sub>L</sub> )	Over sample (n <sub>O</sub> )	Not eligible for over sample	Eligible for over sample*			
1	13,867,300	9,153	4,869	1515.06	988.97	19,962,500	1,346	14830.98
2	39,450,100	26,274	13,848	1501.49	983.25	56,538,300	3,843	14712.02
3	28,598,600	19,417	10,038	1472.86	970.93	44,022,600	3,046	14452.59
4	41,721,700	28,113	14,645	1484.07	975.76	63,098,400	4,369	14442.30
5	51,374,600	34,322	18,034	1496.84	981.26	74,660,800	5,053	14775.54
6	32,669,700	23,242	11,467	1405.63	941.25	61,579,200	4,166	14781.37
7	15,590,500	10,625	5,473	1467.34	968.47	24,458,000	1,667	14671.87
8	11,159,300	7,595	3,917	1469.30	969.36	18,649,400	1,261	14789.37
9	37,254,200	25,486	13,077	1461.75	966.06	59,223,400	3,961	14951.63
10	13,194,400	8,819	4,632	1496.13	980.92	19,610,800	1,288	15225.78

\*Include eligible from base sample and oversample.

### Multiple-Landline Telephone Households

The design weights of households with multiple landline telephone numbers are adjusted to compensate for the higher probability of selection into the sample. The probability of selecting a household in an RDD sample is proportional to the number of distinct telephone numbers associated with the household. The weight adjustment alters the design weight by dividing the weight by the number of landline telephones in the household, based on self-report. The multiple phone adjustment is capped at three to avoid extreme weights. The multiple phone adjustment was not performed for households in the cell phone frame.

### Selection of an Eligible Person within the Household Selected in the Landline Sample

For the landline sample (including the oversample), one member (age 16 or older) from each household was randomly selected to take the survey. The sampling weight for the person selected within a household is equal to the number of eligible adults in the household. The within household subsampling adjustment is capped at three to avoid extreme weights. No within household selection was conducted for cell phones.

Therefore the overall person weight for persons selected in the *ith* household in stratum *h* landline sample is

$$W_{lhi} = W_{lh} \frac{m_{hi}}{A_{hi}}.$$

Where  $m_{hi}$  is the number of persons in the household and  $A_{hi}$  is the number of landline telephone lines in the household.

## 6.2 Adjusting the Sampling Weights of Dual (Landline and Cell) Users in the Two Frames

The 2012 NSBPAB was a partial overlapping landline and cell dual frame where

1. Landline-only (no working cell phone) respondents and dual users were interviewed in the landline sample;
2. Cell-only (does not have landline) respondents were interviewed in the cell phone sample; and
3. Cell-mostly respondents were interviewed in either the landline or the cell phone sample. This group makes up the overlap of the two sample frames.

Cell only respondents can only come from the cell phone sample, but cell-mostly respondents can come from the landline or the cell phone sample. Therefore, we adjust the cell-mostly respondents to account for multiple frames. The weight adjustment is done in two steps.

To adjust the sampling weight for nonresponse the following procedure was carried out.

- 1) The design weights of both landline and cell samples are each adjusted such that the weighted estimates equal the population estimates for each phone status category based on the latest estimates from the National Health Interview Survey (NHIS). The counts in each sample and the NHIS estimates are shown in Figure 6.3.
- 2) Then the weights for the cell-mostly category were adjusted by a factor. The cell-mostly households comprise the only overlapping category in that these households were drawn from both the landline frame and the cell frame. This factor is based on the effective sample sizes

of this group from the two frames. The adjustment factor is  $c = \frac{n_1 / deff_1^2}{n_1 / deff_1^2 + n_2 / deff_2^2}$ ,

where  $deff^2 = n \times \sum w_i^2 \times [\sum w_i]^{-2}$  is a measure of variability of respondent level weights ( $w_i$ ) and  $n$  is the sample size for the survey. The landline design weight is multiplied by  $c$ , where  $0 < c < 1$  and the cell phone design weight by  $1-c$ .

**Figure 6.3 Sample Counts by Sample Frame and Household Type**

Phone status group (g)	Sample size		NHIS Jan-Jun 2012 <sup>1</sup>	Phone status adjustment (PHADJ)		Composite weight (c)
	Landline (n <sub>L</sub> )	Cell (n <sub>C</sub> )		Landline*	Cell*	
Cell-only		1,669	34.0%			1.0000
Cell-mostly	1,085	543	17.6%			0.3056
Dual user	3,291		38.7%			0.0000
Landline only	921		7.8%			0.0000

\*The NHIS percentage are scaled to one million to avoid extremely small values for the adjustments.

<sup>1</sup> Blumberg SJ, Luke JV. Wireless substitution: Early release of estimates from the National Health Interview Survey, January–June 2012. National Center for Health Statistics. December 2012. Available from: <http://www.cdc.gov/nchs/nhis.htm>.

### 6.3 Raking Weights

As the final weighting step, the raking procedure aligns the marginal distribution of respondents on certain socio-demographic characteristics. For the 2012 NSBPAB these include: 1) NHTSA region by sex, 2) age group by race/ethnicity, 3) sex by age group by educational attainment, 4) sex by race/ethnicity, 5) NHTSA region by age group, and 6) age group by sex. In the first iteration, the procedure matches the distribution of the first demographic variable to the population benchmark, recalculates cell counts and creates new totals. The second iteration matches the distribution of the second demographic variable to its population benchmark using the new cell counts from the first iteration and calculates new totals. The iteration continues alternating between the distributions until the adjusted distributions converge with the population benchmark totals. At this point a final set of raked weights are produced. The population data is based on the 2011 American Community Survey (ACS). The sample distributions prior to and after raking adjustments, as well as the population distributions are listed in Figures 6.4-6.9.

### 6.4 Final Weights

The final weight can be represented as follows:

$$\text{Landline: } \text{FINAL\_WT} = W1 \times WWHH / WPHONES \times PHADJ \times (1-C) \times \text{RAKEADJ}$$

$$\text{Cell: } \text{FINAL\_WT} = W1 \times WWHH / WPHONES \times PHADJ \times C \times \text{RAKEADJ}$$

### 6.5. Note on Weight Trimming

We evaluated the weights to determine whether weight trimming was needed. First we calculated the coefficient of variation for the weights before weight trimming. Second, we trimmed weights greater than  $\sqrt{10 \sum w_i^2 / n}$  back to this cutoff. The non-trimmed weights were proportionally increased to offset the trimmed weights. This process was repeated until no weights met the criteria. Finally we compared the coefficients of variation before and after weight trimming.

CV of weights prior to weight trimming = 65.65

CV of weights after weight trimming = 65.47

Since the variation in the weights was not considerably improved, no weight trimming was conducted.

We also looked at the distribution of final weights. Any weight larger than the median weight plus 6 times the interquartile range is declared as large and would need to be trimmed. In this survey, there were no weights larger than median + 6 times the interquartile range. Therefore, no weights were declared as outliers and no trimming was performed.

### Population Control Totals for Raking Weights (Figures 6.4 – 6.9)

**Figure 6.4. Dimension 1: NHTSA Region by Sex**

NHTSA Region	Sex	2011 ACS 16+ Pop	Sample size	Before raking (%)	After raking (%)	Raking Ratio
1	Male		220	2.79	2.37	0.85
	Female		188	2.54	2.41	0.95
2	Male	15,864,597	562	7.18	6.42	0.89
	Female	17,176,251	593	7.57	7.03	0.93
3	Male	12,018,362	402	5.22	4.82	0.92
	Female	12,912,373	411	5.09	5.31	1.04
4	Male	17,242,256	518	7.17	6.90	0.96
	Female	18,500,977	512	6.96	7.61	1.09
5	Male	19,958,556	629	8.39	8.09	0.96
	Female	21,065,776	634	8.56	8.55	1.00
6	Male	14,645,281	408	5.60	5.80	1.04
	Female	15,284,685	394	5.33	6.36	1.19
7	Male		212	2.93	2.66	0.91
	Female		198	2.86	2.66	0.93
8	Male		127	1.62	1.99	1.22
	Female		167	2.14	2.04	0.96
9	Male	17,607,663	476	6.49	7.29	1.12
	Female	18,052,242	451	6.09	7.17	1.18
10	Male		201	2.59	2.32	0.90
	Female		206	2.87	2.18	0.76

**Figure 6.5. Dimension 2: Age Group by Race/Ethnicity**

Age group	Race/Ethnicity	2011 ACS 16+ Pop	Sample size	Before raking (%)	After raking (%)	Raking Ratio
16-34	Hispanic	16,684,652	332	4.97	6.29	1.27
	NH white	46,324,629	1091	15.37	19.38	1.26
	NH black	11,118,074	210	2.97	4.46	1.50
	NH other	7,096,915	185	2.66	2.87	1.08
44-54	Hispanic	13,244,834	293	4.52	5.68	1.26
	NH white	55,147,485	1795	24.97	22.23	0.89
	NH black	10,374,220	271	3.63	4.08	1.12
	NH other	6,714,558	206	2.84	2.73	0.96
55+	Hispanic	6,403,554	162	2.19	2.70	1.23
	NH white	61,140,897	2539	30.63	24.71	0.81
	NH black	7,192,448	241	2.98	2.93	0.98
	NH other	4,713,328	184	2.27	1.93	0.85

**Figure 6.6. Dimension 3: Sex by Age Group by Educational Attainment**

Sex	Age group	Educational attainment	2011 ACS 16+ Pop	Sample size	Before raking (%)	After raking (%)	Raking Ratio
Male	16-24		20,354,986	406	5.95	8.27	1.39
	25-34	LT HS	2,893,738	30	0.50	1.10	2.20
		HS grad	5,834,166	114	1.47	2.34	1.59
		Some college	6,391,960	137	1.92	2.60	1.35
		College grad	5,772,478	236	3.32	2.44	0.73
	35-44	LT HS	2,874,587	37	0.57	1.10	1.93
		HS grad	5,670,566	95	1.35	2.23	1.66
		Some college	5,741,508	169	2.26	2.38	1.05
		College grad	6,021,574	286	3.37	2.55	0.76
	45-64	LT HS	5,267,389	102	1.57	1.95	1.24
		HS grad	11,929,090	335	4.84	4.87	1.00
		Some college	11,413,334	377	5.47	4.64	0.85
		College grad	11,726,552	593	8.08	4.93	0.61
	65+	LT HS	3,655,173	91	1.01	1.43	1.42
		HS grad	5,215,592	230	2.59	2.14	0.83
		Some college	3,988,278	213	2.36	1.63	0.69
College grad		5,057,203	304	3.35	2.08	0.62	
Female	16-24		19,328,937	389	5.81	7.85	1.35
	25-34	LT HS	2,149,472	33	0.54	0.84	1.56
		HS grad	4,272,844	113	1.46	1.71	1.17
		Some college	6,892,751	136	1.86	2.80	1.51
		College grad	7,332,937	224	3.12	3.03	0.97
	35-44	LT HS	2,281,688	31	0.51	0.87	1.72
		HS grad	4,688,678	113	1.58	1.89	1.20
		Some college	6,549,478	151	2.03	2.68	1.32
		College grad	6,999,631	278	3.42	2.89	0.85
	45-64	LT HS	4,808,788	87	1.34	1.87	1.40
		HS grad	12,149,504	365	5.14	4.91	0.96
		Some college	13,515,547	393	5.37	5.52	1.03
		College grad	11,908,384	613	8.49	4.91	0.58
	65+	LT HS	5,158,470	85	0.92	2.05	2.24
		HS grad	8,892,771	238	2.72	3.64	1.34
		Some college	5,345,485	230	2.51	2.17	0.87
College grad		4,072,054	275	3.20	1.67	0.52	

**Figure 6.7. Dimension 4: Sex by Race/Ethnicity**

Sex	Race/Ethnicity	2011 ACS 16+ Pop	Sample size	Before raking (%)	After raking (%)	Raking Ratio
Male	Hispanic	18,394,192	410	6.07	7.44	1.22
	NH white	79,256,339	2696	35.02	32.26	0.92
	NH black	13,384,258	357	4.96	5.41	1.09
	NH other	8,773,385	292	3.94	3.57	0.91
Female	Hispanic	17,938,848	377	5.61	7.23	1.29
	NH white	83,356,672	2729	35.95	34.07	0.95
	NH black	15,300,484	365	4.62	6.07	1.31
	NH other	9,751,415	283	3.82	3.96	1.04

**Figure 6.8. Dimension 5: NHTSA Region by Age Group**

NHTSA Region	Age group	2011 ACS 16+ Pop	Sample size	Before raking	After raking (%)	Raking Ratio
1	16-34	3,602,771	106	1.33	1.46	1.10
	35-54	4,168,891	132	1.93	1.69	0.88
	55+	3,999,126	170	2.07	1.62	0.78
2	16-34	10,491,562	281	3.75	4.26	1.14
	35-54	11,523,345	405	5.50	4.69	0.85
	55+	11,025,941	469	5.50	4.51	0.82
3	16-34	8,099,818	175	2.20	3.29	1.49
	35-54	8,792,382	310	4.20	3.57	0.85
	55+	8,038,535	328	3.91	3.27	0.84
4	16-34	11,255,910	249	3.74	4.57	1.22
	35-54	12,263,040	341	4.93	4.98	1.01
	55+	12,224,283	440	5.46	4.95	0.91
5	16-34	13,176,894	292	4.34	5.35	1.23
	35-54	14,259,563	431	5.96	5.80	0.97
	55+	13,587,875	540	6.65	5.49	0.83
6	16-34	10,614,904	190	2.95	4.31	1.46
	35-54	10,470,195	288	4.22	4.25	1.01
	55+	8,844,868	324	3.75	3.60	0.96
7	16-34	4,291,500	92	1.42	1.74	1.22
	35-54	4,396,985	134	2.06	1.78	0.86
	55+	4,455,481	184	2.30	1.80	0.78
8	16-34	3,500,846	84	1.11	1.42	1.28
	35-54	3,378,391	102	1.43	1.37	0.96
	55+	2,939,643	108	1.22	1.24	1.01
9	16-34	12,529,124	268	3.92	5.09	1.30
	35-54	12,452,551	288	3.90	5.06	1.30
	55+	10,678,230	371	4.77	4.32	0.91
10	16-34	3,660,941	81	1.19	1.49	1.25
	35-54	3,775,754	134	1.83	1.54	0.84
	55+	3,656,245	192	2.44	1.48	0.61

**Figure 6.9. Dimension 6: Age Group by Sex**

Age group	Sex	2011 ACS 16+ Pop	Sample size	Before raking (%)	After raking (%)	Raking Ratio
16-24	Male	20,354,986	406	5.95	8.27	1.39
	Female	19,328,937	389	5.81	7.85	1.35
18-34	Male	20,892,342	517	7.22	8.49	1.18
	Female	20,648,004	506	6.98	8.39	1.20
35-44	Male	20,308,235	587	7.55	8.25	1.09
	Female	20,519,475	573	7.53	8.34	1.11
45-54	Male	21,990,093	706	10.61	8.93	0.84
	Female	22,663,294	699	10.28	9.21	0.90
55-64	Male	18,346,272	701	9.36	7.45	0.80
	Female	19,718,929	759	10.06	8.01	0.80
65-74	Male	10,474,911	499	5.99	4.26	0.71
	Female	12,014,318	503	6.05	4.88	0.81
75+	Male	7,441,335	339	3.32	3.02	0.91
	Female	11,454,462	325	3.30	4.65	1.41

## 6.6 Estimation

For producing population based estimates of population totals, means and proportions, each respondent is assigned a final sampling weight as described in the previous section. For example, the estimate of a population proportion of persons responding “yes” to a specific question in the survey will be estimated as shown below. The estimate is a ratio given by

$$\hat{P} = \frac{\hat{Y}}{\hat{N}}$$

where  $\hat{Y}$  is the estimated number of persons who said “yes”,  $\hat{N}$  is the estimated number of persons eligible for the survey and  $\hat{P}$  is the estimated proportion.. The sample was selected independently from the two strata (Landline frame and Cell frame). The sampling weights of persons who have a probability of being selected in both samples were adjusted to account for this duplication such that the sum of the two frame estimates equals the total population size of all dual users. Therefore, the total population estimate will be the sum of two strata estimates as given below.

$$\begin{aligned}\hat{Y} &= \hat{Y}_1 + \hat{Y}_2, \\ \hat{N} &= \hat{N}_1 + \hat{N}_2.\end{aligned}$$

The sampling weights that are used to determine the estimated population totals are the final sampling weights of persons selected in each frame as described under the section on weighting

The variance of  $\hat{Y}$  is  $V(\hat{Y}) = V(\hat{Y}_1) + V(\hat{Y}_2)$  and  $V(\hat{N}) = V(\hat{N}_1) + V(\hat{N}_2)$ .

## 7. Precision of Sample Estimates

The confidence interval for an estimate derived from the survey sample is:

$$\hat{y} \pm z_{1-\alpha/2} \sqrt{Var(\hat{y})}$$

where:

$\hat{y}$  = an estimate of the population proportion;

$Var(\hat{y})$  = is the sampling variance of  $\hat{y}$ ; and

$z_{1-\alpha/2}$  =  $(1 - \alpha/2)$ th percentile of the standard normal distribution (95%:  $\alpha = 5\%$ ,  $z = 1.96$ ; 90%:  $\alpha = 10\%$ ,  $z = 1.645$ ).

### 7.1 Sampling Error

The sampling variance for an estimate is a measure of uncertainty that reflects the fact that the estimate is derived from a sample drawn from the population. If one were to draw a second sample in the exact same manner, the estimate would be different from the first simply due to the fact that the sample contains different members of the population. A third sample would be different from the first two, and so on. The sampling variance measures how different the estimates would be had different independent samples been drawn.

The sampling error for a complex survey depends on three things,

1.  $\sigma_y^2$  = the population variance for the characteristic: the sampling variance is higher when there is a lot of variability in the population (large  $\sigma_y^2$ ) and lower when there is little variability in the population.
2.  $n$  = The sample size: the sampling variance is higher when the sample size is small and lower when the sample size is large. The sampling variance for estimates of subgroups is based on the sample size for those subgroups.
3.  $DEFF$  = design effect:<sup>2</sup> Sampling design features such as stratification, clustering, dual-frame sampling, and survey weighting all contribute to the sampling variability. The design effect is a measure of inefficiency (or efficiency) of the complex sample relative to a simple random sample, calculated as  $DEFF = Var(\hat{y})/Var_{srs}(\hat{y})$ .

The variances of the estimates from this survey were computed using the SAS SURVEYMEANS program. The variance of an estimate from the survey is the sum of the variances of the estimates in the two primary strata which are Landline and Cell frames. The variances of the estimates from the sample selected in the Landline frame are aggregations of 10 strata variances where each stratum is a NHTSA region. Similarly, the variances of the estimates in the Cell frame are an aggregation of variances of estimates within each NHTSA region. The sum of the two frame variances gives the variance of an overall estimate. The variances are calculated using final sampling weights under the assumption of sampling with replacement.

We can write the sampling variance of the complex design as:  $Var(\hat{y}) = Var_{srs}(\hat{y}) \times DEFF = \sigma_y^2/n \times DEFF$ . Therefore, one can calculate the sampling variance with the population variance (or an estimate of the population variance); the sample size; and the design effect.

---

<sup>2</sup> Kish, L. (1965). *Survey Sampling*, New York: John Wiley & Sons.

## 7.2 Estimating the Population Variance

The population variance is often estimated from the survey data,  $s^2 = \sum_n (y_i - \bar{y})^2 / n$ . In the case of percentages, the population variance  $\sigma_y^2 = P \times (1-P)$  and can be estimated from the survey estimate  $s^2 = \hat{p} \times (1 - \hat{p})$ . An alternative is to use the variance estimates based on the percentages presented in Table 7.1. Rounding the estimated percentage up to the nearest 5 percentage points (e.g., 17% to 20%, 34% to 35%) is a conservative estimate of the population variance. The variance for a percentage is low when a small percentage of the population has the characteristic (or a large percentage of the population has the characteristic) and high when the percentage of the population with the characteristic is equal (50/50).

## 7.3 Estimating Design Effects

The sampling design impacts the variance for each data item differently. Therefore the design effect for one survey estimate might be higher or lower than the design effect of another survey estimate. The design effect will also vary for different subpopulations represented in the sample, such as males and females. To simplify the calculations of the sampling error, design effect approximations are presented in Table 7.1. These approximations are based on the average design effect for over 100 data items. All data items are percentages calculated from binary responses (1=yes, 0=no).

In each selected stratum, persons belonging to different domains were identified after selection of the sample. Stratum 1 has 3 domains, Landline only, Dual users, and Cell mostly. The second frame has two domains, Cell only and Cell mostly, as shown previously in Figure 6.3. Estimates for these domains can also be obtained.

We can calculate the variances for some estimates either by using the PROC SURVEYMEANS or using an average design effect based on a selected number of variables for which the variances are estimated using SAS PROC SURVEY MEANS (refer to user guide for more details):

```
PROC SURVEYMEANS;
```

```
VAR <DATA ITEMS>;
```

```
STRATUM FRAME NHTSAREG;
```

```
WEIGHT FINAL_WT;
```

```
RUN;
```

**Table 7.1. Estimated 95% Error Margins Overall and Various Population Subgroups**

	DEFF	N	P =	50, 50 0.2500	45, 55 0.2475	40, 60 0.2400	35, 65 0.2275	30, 70 0.2100	25, 75 0.1875	20, 80 0.1600	15, 85 0.1275	10, 90 0.0900	5, 95 0.0475
<b>Overall</b>	1.45	7509		1.4%	1.4%	1.3%	1.3%	1.2%	1.2%	1.1%	1.0%	0.8%	0.6%
<b>NHTSA Region</b>													
1	1.28	408		5.5%	5.5%	5.4%	5.2%	5.0%	4.8%	4.4%	3.9%	3.3%	2.4%
2	1.36	1155		3.4%	3.3%	3.3%	3.2%	3.1%	2.9%	2.7%	2.4%	2.0%	1.5%
3	1.43	813		4.1%	4.1%	4.0%	3.9%	3.8%	3.6%	3.3%	2.9%	2.5%	1.8%
4	1.36	1030		3.6%	3.5%	3.5%	3.4%	3.3%	3.1%	2.8%	2.5%	2.1%	1.6%
5	1.38	1263		3.2%	3.2%	3.2%	3.1%	3.0%	2.8%	2.6%	2.3%	1.9%	1.4%
6	1.44	802		4.2%	4.1%	4.1%	4.0%	3.8%	3.6%	3.3%	3.0%	2.5%	1.8%
7	1.27	410		5.5%	5.4%	5.3%	5.2%	5.0%	4.7%	4.4%	3.9%	3.3%	2.4%
8	1.37	294		6.7%	6.7%	6.6%	6.4%	6.1%	5.8%	5.4%	4.8%	4.0%	2.9%
9	1.38	927		3.8%	3.8%	3.7%	3.6%	3.5%	3.3%	3.0%	2.7%	2.3%	1.6%
10	1.49	407		5.9%	5.9%	5.8%	5.7%	5.4%	5.1%	4.7%	4.2%	3.6%	2.6%
<b>Gender</b>													
Male	1.43	3351		2.0%	2.0%	2.0%	1.9%	1.9%	1.8%	1.6%	1.4%	1.2%	0.9%
Female	1.43	4158		1.8%	1.8%	1.8%	1.7%	1.7%	1.6%	1.5%	1.3%	1.1%	0.8%
<b>Age group</b>													
16 or 17	1.24	140		9.2%	9.2%	9.1%	8.8%	8.5%	8.0%	7.4%	6.6%	5.5%	4.0%
18 to 24	1.16	655		4.1%	4.1%	4.0%	3.9%	3.8%	3.6%	3.3%	2.9%	2.5%	1.8%
25 to 34	1.37	1022		3.6%	3.6%	3.5%	3.4%	3.3%	3.1%	2.9%	2.6%	2.2%	1.6%
35 to 44	1.43	1154		3.5%	3.4%	3.4%	3.3%	3.2%	3.0%	2.8%	2.5%	2.1%	1.5%
45 to 54	1.32	1403		3.0%	3.0%	2.9%	2.9%	2.8%	2.6%	2.4%	2.1%	1.8%	1.3%
55 to 64	1.27	1430		2.9%	2.9%	2.9%	2.8%	2.7%	2.5%	2.3%	2.1%	1.7%	1.3%
65 to 74	1.40	1002		3.7%	3.6%	3.6%	3.5%	3.4%	3.2%	2.9%	2.6%	2.2%	1.6%
75 or older	1.43	664		4.5%	4.5%	4.5%	4.3%	4.2%	3.9%	3.6%	3.2%	2.7%	2.0%

**Table 7.1. Estimated 95% Error Margins Overall and Various Population Subgroups (Continued)**

	DEFF	N	P =	50, 50 0.2500	45, 55 0.2475	40, 60 0.2400	35, 65 0.2275	30, 70 0.2100	25, 75 0.1875	20, 80 0.1600	15, 85 0.1275	10, 90 0.0900	5, 95 0.0475
<b>Race/Ethnicity</b>													
Hisp	1.30	787		4.0%	4.0%	3.9%	3.8%	3.6%	3.4%	3.2%	2.8%	2.4%	1.7%
NH AIAN	1.26	176		8.3%	8.3%	8.1%	7.9%	7.6%	7.2%	6.6%	5.9%	5.0%	3.6%
NH Asian	1.29	203		7.8%	7.8%	7.7%	7.5%	7.2%	6.8%	6.3%	5.6%	4.7%	3.4%
NH black	1.34	768		4.1%	4.1%	4.0%	3.9%	3.8%	3.5%	3.3%	2.9%	2.5%	1.8%
NH white	1.42	5394		1.6%	1.6%	1.6%	1.5%	1.5%	1.4%	1.3%	1.1%	1.0%	0.7%
<b>Educational Attainment</b>													
LT HS	1.27	685		4.2%	4.2%	4.1%	4.0%	3.9%	3.7%	3.4%	3.0%	2.5%	1.8%
HS grad	1.29	1829		2.6%	2.6%	2.5%	2.5%	2.4%	2.3%	2.1%	1.9%	1.6%	1.1%
Some college	1.28	2060		2.4%	2.4%	2.4%	2.3%	2.2%	2.1%	2.0%	1.7%	1.5%	1.1%
Coll grad	1.33	1565		2.9%	2.8%	2.8%	2.7%	2.6%	2.5%	2.3%	2.0%	1.7%	1.2%
Grad school	1.29	1317		3.1%	3.1%	3.0%	2.9%	2.8%	2.7%	2.5%	2.2%	1.8%	1.3%
<b>Driving frequency</b>													
Almost every day/every day	1.44	5309		1.6%	1.6%	1.6%	1.5%	1.5%	1.4%	1.3%	1.2%	1.0%	0.7%
Few days a week	1.41	1063		3.6%	3.6%	3.5%	3.4%	3.3%	3.1%	2.9%	2.5%	2.1%	1.6%
Few days a month	1.33	242		7.3%	7.2%	7.1%	6.9%	6.6%	6.3%	5.8%	5.2%	4.4%	3.2%
Few days a year	1.23	96		11.1%	11.1%	10.9%	10.6%	10.2%	9.6%	8.9%	7.9%	6.7%	4.8%
Never/over a year ago	1.32	744		4.1%	4.1%	4.0%	3.9%	3.8%	3.6%	3.3%	2.9%	2.5%	1.8%

**Table 7.2. Estimated 95% Error Margins Overall and Various Sample Sizes**

DEFF	n	P	50, 50	45, 55	40, 60	35, 65	30, 70	25, 75	20, 80	15, 85	10, 90	5, 95
		0.2500	0.2475	0.2400	0.2275	0.2100	0.1875	0.1600	0.1275	0.0900	0.0475	
1.45	7500	1.4%	1.4%	1.3%	1.3%	1.2%	1.2%	1.1%	1.0%	0.8%	0.6%	
	6500	1.5%	1.5%	1.4%	1.4%	1.3%	1.3%	1.2%	1.0%	0.9%	0.6%	
	5500	1.6%	1.6%	1.6%	1.5%	1.5%	1.4%	1.3%	1.1%	1.0%	0.7%	
	4500	1.8%	1.7%	1.7%	1.7%	1.6%	1.5%	1.4%	1.3%	1.1%	0.8%	
	4000	1.9%	1.9%	1.8%	1.8%	1.7%	1.6%	1.5%	1.3%	1.1%	0.8%	
	3500	2.0%	2.0%	2.0%	1.9%	1.8%	1.7%	1.6%	1.4%	1.2%	0.9%	
	3000	2.2%	2.1%	2.1%	2.1%	2.0%	1.9%	1.7%	1.5%	1.3%	0.9%	
	2500	2.4%	2.3%	2.3%	2.2%	2.2%	2.0%	1.9%	1.7%	1.4%	1.0%	
	2250	2.5%	2.5%	2.4%	2.4%	2.3%	2.2%	2.0%	1.8%	1.5%	1.1%	
	2000	2.6%	2.6%	2.6%	2.5%	2.4%	2.3%	2.1%	1.9%	1.6%	1.1%	
	1750	2.8%	2.8%	2.8%	2.7%	2.6%	2.4%	2.3%	2.0%	1.7%	1.2%	
	1500	3.0%	3.0%	3.0%	2.9%	2.8%	2.6%	2.4%	2.2%	1.8%	1.3%	
	1250	3.3%	3.3%	3.3%	3.2%	3.1%	2.9%	2.7%	2.4%	2.0%	1.5%	
	1000	3.7%	3.7%	3.7%	3.6%	3.4%	3.2%	3.0%	2.7%	2.2%	1.6%	
	750	4.3%	4.3%	4.2%	4.1%	3.9%	3.7%	3.4%	3.1%	2.6%	1.9%	
	500	5.3%	5.2%	5.2%	5.0%	4.8%	4.6%	4.2%	3.8%	3.2%	2.3%	
	400	5.9%	5.9%	5.8%	5.6%	5.4%	5.1%	4.7%	4.2%	3.5%	2.6%	
	300	6.8%	6.8%	6.7%	6.5%	6.2%	5.9%	5.4%	4.9%	4.1%	3.0%	
	200	8.3%	8.3%	8.2%	8.0%	7.6%	7.2%	6.7%	6.0%	5.0%	3.6%	
	150	9.6%	9.6%	9.4%	9.2%	8.8%	8.3%	7.7%	6.9%	5.8%	4.2%	
	100	11.8%	11.7%	11.5%	11.2%	10.8%	10.2%	9.4%	8.4%	7.1%	5.1%	
	50	16.7%	16.6%	16.3%	15.9%	15.3%	14.4%	13.3%	11.9%	10.0%	7.3%	

## 7.4 Testing for Statistical Differences

Sampling error is also used to determine whether two population subgroups (or domains) are significantly different with respect to a certain statistic, that is, the difference in the sampled subgroup estimates is large enough that it would be unlikely to randomly occur if the statistics were the same for the subgroups. Consider the hypothesis test for comparing two domains:

$$H_0: Y_1 = Y_2 \text{ or } Y_1 - Y_2 = 0$$

$$H_1: Y_1 \neq Y_2 \text{ or } Y_1 - Y_2 \neq 0$$

One method to test whether  $Y_1$  is different from  $Y_2$  is to calculate a confidence interval around the difference in the sample estimates,<sup>3</sup>  $(\hat{y}_1 - \hat{y}_2) \pm z_{1-\alpha/2} \sqrt{Var(\hat{y}_1 - \hat{y}_2)}$ . If the interval does not contain 0, we conclude that  $Y_1$  is different from  $Y_2$ —the observed difference in the sample estimates is not likely to randomly occur if  $Y_1$  was equal to  $Y_2$ , therefore there is evidence to indicate a difference in the population statistics. If the interval does contain 0, we cannot conclude that  $Y_1$  is different from  $Y_2$ —there is insufficient evidence to indicate a difference in the population statistics.

$Var(\hat{y}_1 - \hat{y}_2) = Var(\hat{y}_1) + Var(\hat{y}_2)$ , represents the sum of the variances for two population subgroups. The subgroup variances are estimated as described above. Table 7.3 includes the estimated 95-percent error margins for the differences between subgroups of various size. If the observed difference is less than or equal to the error margin, the difference is not statistically significant at the  $\alpha = 0.05$  significance level. If it is greater than the error margin, the difference is statistically significant at the  $\alpha = 0.05$  significance level.

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<sup>3</sup> This method should only be used for large sample sizes. One rule of thumb is  $n_1$  and  $n_2$  both greater than 30.

**Table 7.3. Estimated 95% Error Margins For the Difference Between Two Subgroups**

DEFF	$n_1$	P	$n_2=7500$	5000	4000	3000	2000	1500	1000	500	400	300	200	100	50
			1.45	7500	50,50	1.9%	2.2%	2.3%	2.5%	3.0%	3.3%	4.0%	5.4%	6.0%	6.9%
		40,60	1.9%	2.1%	2.3%	2.5%	2.9%	3.3%	3.9%	5.3%	5.9%	6.8%	8.3%	11.6%	16.4%
		30,70	1.8%	2.0%	2.1%	2.3%	2.7%	3.1%	3.6%	5.0%	5.5%	6.4%	7.7%	10.9%	15.3%
		20,80	1.5%	1.7%	1.8%	2.0%	2.4%	2.7%	3.2%	4.4%	4.8%	5.6%	6.8%	9.5%	13.4%
		10,90	1.2%	1.3%	1.4%	1.5%	1.8%	2.0%	2.4%	3.3%	3.6%	4.2%	5.1%	7.1%	10.0%
	5000	50,50	2.2%	2.4%	2.5%	2.7%	3.1%	3.5%	4.1%	5.5%	6.1%	7.0%	8.5%	11.9%	16.8%
		40,60	2.1%	2.3%	2.4%	2.7%	3.1%	3.4%	4.0%	5.4%	6.0%	6.9%	8.3%	11.7%	16.4%
		30,70	2.0%	2.2%	2.3%	2.5%	2.9%	3.2%	3.7%	5.1%	5.6%	6.4%	7.8%	10.9%	15.4%
		20,80	1.7%	1.9%	2.0%	2.2%	2.5%	2.8%	3.3%	4.4%	4.9%	5.6%	6.8%	9.5%	13.4%
		10,90	1.3%	1.4%	1.5%	1.6%	1.9%	2.1%	2.4%	3.3%	3.7%	4.2%	5.1%	7.1%	10.1%
	4000	50,50	2.3%	2.5%	2.6%	2.8%	3.2%	3.6%	4.2%	5.6%	6.2%	7.1%	8.5%	11.9%	16.8%
		40,60	2.3%	2.4%	2.6%	2.8%	3.2%	3.5%	4.1%	5.5%	6.1%	6.9%	8.4%	11.7%	16.4%
		30,70	2.1%	2.3%	2.4%	2.6%	3.0%	3.3%	3.8%	5.1%	5.7%	6.5%	7.8%	10.9%	15.4%
		20,80	1.8%	2.0%	2.1%	2.3%	2.6%	2.9%	3.3%	4.5%	4.9%	5.6%	6.8%	9.5%	13.4%
		10,90	1.4%	1.5%	1.6%	1.7%	1.9%	2.1%	2.5%	3.4%	3.7%	4.2%	5.1%	7.2%	10.1%
	3000	50,50	2.5%	2.7%	2.8%	3.0%	3.4%	3.7%	4.3%	5.7%	6.3%	7.1%	8.6%	12.0%	16.8%
		40,60	2.5%	2.7%	2.8%	3.0%	3.3%	3.7%	4.2%	5.6%	6.1%	7.0%	8.4%	11.7%	16.5%
		30,70	2.3%	2.5%	2.6%	2.8%	3.1%	3.4%	3.9%	5.2%	5.7%	6.5%	7.9%	11.0%	15.4%
		20,80	2.0%	2.2%	2.3%	2.4%	2.7%	3.0%	3.4%	4.6%	5.0%	5.7%	6.9%	9.6%	13.4%
		10,90	1.5%	1.6%	1.7%	1.8%	2.0%	2.2%	2.6%	3.4%	3.8%	4.3%	5.2%	7.2%	10.1%
	2000	50,50	3.0%	3.1%	3.2%	3.4%	3.7%	4.0%	4.6%	5.9%	6.5%	7.3%	8.7%	12.1%	16.9%
		40,60	2.9%	3.1%	3.2%	3.3%	3.7%	3.9%	4.5%	5.8%	6.3%	7.1%	8.6%	11.8%	16.5%
		30,70	2.7%	2.9%	3.0%	3.1%	3.4%	3.7%	4.2%	5.4%	5.9%	6.7%	8.0%	11.1%	15.5%
		20,80	2.4%	2.5%	2.6%	2.7%	3.0%	3.2%	3.7%	4.7%	5.2%	5.8%	7.0%	9.7%	13.5%
		10,90	1.8%	1.9%	1.9%	2.0%	2.2%	2.4%	2.7%	3.5%	3.9%	4.4%	5.2%	7.2%	10.1%
	1500	50,50	3.3%	3.5%	3.6%	3.7%	4.0%	4.3%	4.8%	6.1%	6.6%	7.5%	8.9%	12.2%	16.9%
		40,60	3.3%	3.4%	3.5%	3.7%	3.9%	4.2%	4.7%	6.0%	6.5%	7.3%	8.7%	11.9%	16.6%
		30,70	3.1%	3.2%	3.3%	3.4%	3.7%	3.9%	4.4%	5.6%	6.1%	6.8%	8.1%	11.2%	15.5%
		20,80	2.7%	2.8%	2.9%	3.0%	3.2%	3.4%	3.8%	4.9%	5.3%	6.0%	7.1%	9.7%	13.6%
		10,90	2.0%	2.1%	2.1%	2.2%	2.4%	2.6%	2.9%	3.7%	4.0%	4.5%	5.3%	7.3%	10.2%

**Table 7.3. Estimated 95% Error Margins For the Difference Between Two Subgroups (Continued)**

DEFF	$n_1$	P	$n_2=7500$	5000	4000	3000	2000	1500	1000	500	400	300	200	100	50
1.45	1000	50,50	4.0%	4.1%	4.2%	4.3%	4.6%	4.8%	5.3%	6.5%	7.0%	7.8%	9.1%	12.4%	17.1%
		40,60	3.9%	4.0%	4.1%	4.2%	4.5%	4.7%	5.2%	6.3%	6.8%	7.6%	8.9%	12.1%	16.7%
		30,70	3.6%	3.7%	3.8%	3.9%	4.2%	4.4%	4.8%	5.9%	6.4%	7.1%	8.4%	11.3%	15.7%
		20,80	3.2%	3.3%	3.3%	3.4%	3.7%	3.8%	4.2%	5.2%	5.6%	6.2%	7.3%	9.9%	13.7%
		10,90	2.4%	2.4%	2.5%	2.6%	2.7%	2.9%	3.2%	3.9%	4.2%	4.7%	5.5%	7.4%	10.2%
500	500	50,50	5.4%	5.5%	5.6%	5.7%	5.9%	6.1%	6.5%	7.5%	7.9%	8.6%	9.9%	12.9%	17.5%
		40,60	5.3%	5.4%	5.5%	5.6%	5.8%	6.0%	6.3%	7.3%	7.7%	8.4%	9.7%	12.7%	17.1%
		30,70	5.0%	5.1%	5.1%	5.2%	5.4%	5.6%	5.9%	6.8%	7.2%	7.9%	9.0%	11.8%	16.0%
		20,80	4.4%	4.4%	4.5%	4.6%	4.7%	4.9%	5.2%	6.0%	6.3%	6.9%	7.9%	10.3%	14.0%
		10,90	3.3%	3.3%	3.4%	3.4%	3.5%	3.7%	3.9%	4.5%	4.7%	5.2%	5.9%	7.7%	10.5%
400	400	50,50	6.0%	6.1%	6.2%	6.3%	6.5%	6.6%	7.0%	7.9%	8.3%	9.0%	10.2%	13.2%	17.7%
		40,60	5.9%	6.0%	6.1%	6.1%	6.3%	6.5%	6.8%	7.7%	8.2%	8.8%	10.0%	12.9%	17.3%
		30,70	5.5%	5.6%	5.7%	5.7%	5.9%	6.1%	6.4%	7.2%	7.6%	8.3%	9.4%	12.1%	16.2%
		20,80	4.8%	4.9%	4.9%	5.0%	5.2%	5.3%	5.6%	6.3%	6.7%	7.2%	8.2%	10.5%	14.1%
		10,90	3.6%	3.7%	3.7%	3.8%	3.9%	4.0%	4.2%	4.7%	5.0%	5.4%	6.1%	7.9%	10.6%
300	300	50,50	6.9%	7.0%	7.1%	7.1%	7.3%	7.5%	7.8%	8.6%	9.0%	9.6%	10.8%	13.6%	18.0%
		40,60	6.8%	6.9%	6.9%	7.0%	7.1%	7.3%	7.6%	8.4%	8.8%	9.4%	10.5%	13.3%	17.6%
		30,70	6.4%	6.4%	6.5%	6.5%	6.7%	6.8%	7.1%	7.9%	8.3%	8.8%	9.9%	12.5%	16.5%
		20,80	5.6%	5.6%	5.6%	5.7%	5.8%	6.0%	6.2%	6.9%	7.2%	7.7%	8.6%	10.9%	14.4%
		10,90	4.2%	4.2%	4.2%	4.3%	4.4%	4.5%	4.7%	5.2%	5.4%	5.8%	6.5%	8.2%	10.8%
200	200	50,50	8.4%	8.5%	8.5%	8.6%	8.7%	8.9%	9.1%	9.9%	10.2%	10.8%	11.8%	14.4%	18.6%
		40,60	8.3%	8.3%	8.4%	8.4%	8.6%	8.7%	8.9%	9.7%	10.0%	10.5%	11.5%	14.1%	18.3%
		30,70	7.7%	7.8%	7.8%	7.9%	8.0%	8.1%	8.4%	9.0%	9.4%	9.9%	10.8%	13.2%	17.1%
		20,80	6.8%	6.8%	6.8%	6.9%	7.0%	7.1%	7.3%	7.9%	8.2%	8.6%	9.4%	11.5%	14.9%
		10,90	5.1%	5.1%	5.1%	5.2%	5.2%	5.3%	5.5%	5.9%	6.1%	6.5%	7.1%	8.7%	11.2%
100	100	50,50	11.9%	11.9%	11.9%	12.0%	12.1%	12.2%	12.4%	12.9%	13.2%	13.6%	14.4%	16.7%	20.4%
		40,60	11.6%	11.7%	11.7%	11.7%	11.8%	11.9%	12.1%	12.7%	12.9%	13.3%	14.1%	16.3%	20.0%
		30,70	10.9%	10.9%	10.9%	11.0%	11.1%	11.2%	11.3%	11.8%	12.1%	12.5%	13.2%	15.3%	18.7%
		20,80	9.5%	9.5%	9.5%	9.6%	9.7%	9.7%	9.9%	10.3%	10.5%	10.9%	11.5%	13.3%	16.3%
		10,90	7.1%	7.1%	7.2%	7.2%	7.2%	7.3%	7.4%	7.7%	7.9%	8.2%	8.7%	10.0%	12.2%

**Table 7.3. Estimated 95% Error Margins For the Difference Between Two Subgroups (Continued)**

DEFF	$n_1$	P	$n_2=7500$	5000	4000	3000	2000	1500	1000	500	400	300	200	100	50
1.45	50	50,50	16.7%	16.8%	16.8%	16.8%	16.9%	16.9%	17.1%	17.5%	17.7%	18.0%	18.6%	20.4%	23.6%
		40,60	16.4%	16.4%	16.4%	16.5%	16.5%	16.6%	16.7%	17.1%	17.3%	17.6%	18.3%	20.0%	23.1%
		30,70	15.3%	15.4%	15.4%	15.4%	15.5%	15.5%	15.7%	16.0%	16.2%	16.5%	17.1%	18.7%	21.6%
		20,80	13.4%	13.4%	13.4%	13.4%	13.5%	13.6%	13.7%	14.0%	14.1%	14.4%	14.9%	16.3%	18.9%
		10,90	10.0%	10.1%	10.1%	10.1%	10.1%	10.2%	10.2%	10.5%	10.6%	10.8%	11.2%	12.2%	14.1%

## 8. Nonresponse Bias Analysis

Survey nonresponse bias occurs when the propensity to respond to the survey is correlated with the questions being asked of the respondent. However, the direct effects of nonresponse are difficult to quantify since survey data is only available for the respondents. Therefore, we use other data sources, such as information on the sampling frame and/or benchmark data, to evaluate nonresponse. Generally for RDD samples, like the one used for the 2012 National Survey of Bicyclist and Pedestrian Attitudes and Behavior, the sampling frame provides little information about the nonrespondents other than the geo-demographic data associated with their telephone number. This allows us to identify areas, and the characteristics of those areas, where nonresponse is highest. However, it doesn't tell us the characteristics of those who ultimately responded or did not respond to the survey. Benchmark data, generally based on known socio-demographic population data, is used to compare the sample to the population. When a sample distribution is different from the benchmark for a particular characteristic, we infer that the effect is due to nonresponse, assuming complete coverage of the population and an unbiased sample. Weighting survey data mitigates the risk of nonresponse bias to the extent that the weighting variables are correlated with nonresponse propensity and the survey items.

A Non-Response Follow-Up (NRFU) Study was conducted among respondents who had been classified as non-contacts or refusals during the main data collection effort. The survey instrument was 5 minutes in length and contained a few substantive questions from the main questionnaire as well as demographic items. A total of 224 respondents completed the NRFU questionnaire, however the results did not differ significantly from the main survey administration and were therefore excluded from the non-response bias analysis. Any adjustment for non-response bias was based solely on benchmark data.

Below are the sample percentages and population benchmarks for selected demographics. The sample percentages are calculated with weights that adjust for the sampling design (including the dual-frame adjustment) to best isolate nonresponse. The sample underrepresents the younger age groups, adults with a high school degree or lower, and minorities. These population distributions, taken from the 2011 American Community Survey, were used in the weighting.

**Table 8.1 Sample and Population Comparison**

	Total			Male			Female		
	n	Pop. (%)*	Sample (%)	n	Pop. (%)*	Sample (%)	n	Pop. (%)*	Sample (%)
<b>Total</b>	7509	100	100	3755	48.7	50.2	3754	51.3	49.8
<b>NHTSA Region</b>									
1	408	4.8	5.3	219	2.3	2.8	189	2.5	2.6
2	1155	13.4	14.7	561	6.4	7.3	594	7.0	7.5
3	812	10.1	10.3	401	4.9	5.1	411	5.2	5.1
4	1029	14.5	14.1	520	7.0	7.2	509	7.5	6.9
5	1263	16.7	16.9	624	8.1	8.4	639	8.6	8.5
6	800	12.2	10.9	408	5.9	5.6	392	6.2	5.3
7	410	5.3	5.8	211	2.6	2.9	199	2.7	2.9
8	299	4.0	3.9	133	2.0	1.7	166	2.0	2.1
9	926	14.5	12.6	477	7.2	6.5	449	7.3	6.0
10	407	4.5	5.5	201	2.2	2.6	206	2.3	2.9

	Total			Male			Female			
	n	Pop. (%)*	Sample (%)	n	Pop. (%)*	Sample (%)	n	Pop. (%)*	Sample (%)	
<b>Total</b>	7509	100	100	3755	48.7	50.2	3754	51.3	49.8	
<b>Age group</b>										
16-24	795	16.1	11.8	417	8.3	6.1	378	7.9	5.7	
25-34	1023	16.9	14.2	517	8.5	7.2	506	8.4	7.0	
35-44	1160	16.6	15.1	590	8.3	7.7	570	8.3	7.4	
45-54	1405	18.1	20.9	706	8.9	10.6	699	9.2	10.2	
55-64	1460	15.5	19.4	697	7.5	9.3	763	8.0	10.1	
64-74	1002	9.1	12.0	491	4.3	5.9	511	4.9	6.1	
75+	664	7.7	6.6	337	3.0	3.3	327	4.7	3.3	
<b>Race/Ethnicity</b>										
Hispanic	787	14.8	11.7	408	7.5	6.0	379	7.3	5.7	
	542									
NH white	5	66.1	71.0	2692	32.2	35.1	2733	33.9	35.9	
NH black	722	11.7	9.6	359	5.4	5.0	363	6.2	4.5	
NH Asian	575	7.5	7.8	296	3.6	4.0	279	4.0	3.7	
<b>Educational Attainment by age</b>										
16-24	795	16.1	11.8	417	8.3	6.1	378	7.9	5.7	
25-34	LT HS	62	2.0	1.0	31	1.2	0.5	31	0.9	0.5
	HS grad	228	4.1	2.9	112	2.4	1.5	116	1.7	1.5
	Some college	273	5.4	3.8	135	2.6	1.9	138	2.8	1.9
	Colleg grad	460	5.3	6.4	239	2.3	3.4	221	3.0	3.1
35-44	LT HS	69	2.1	1.1	40	1.2	0.6	29	0.9	0.5
	HS grad	209	4.2	2.9	99	2.3	1.4	110	1.9	1.5
	Some college	318	5.0	4.2	171	2.3	2.3	147	2.7	2.0
	Colleg grad	564	5.3	6.8	280	2.4	3.4	284	2.8	3.5
45-64	LT HS	191	4.1	2.9	101	2.1	1.6	90	2.0	1.4
	HS grad	699	9.8	10.0	337	4.8	4.9	362	4.9	5.0
	Some college	771	10.1	10.8	370	4.6	5.4	401	5.5	5.5
	Colleg grad	1204	9.6	16.6	595	4.8	8.1	609	4.8	8.5
65+	LT HS	177	3.6	1.9	88	1.5	1.0	89	2.1	1.0
	HS grad	467	5.7	5.3	229	2.1	2.6	238	3.6	2.7
	Some college	442	3.8	4.9	210	1.6	2.3	232	2.2	2.5
	Colleg grad	580	3.7	6.6	301	2.1	3.3	279	1.7	3.2
*Population Estimates were taken from the 2011 American Community Survey, conducted by the US Census Bureau										

# **Appendix A**

## **Sample Dispositions**

**Figure A.1 Disposition Report for Landline Cross-section Sample**

	Original Count	Estimated Qualified Household*	Estimated Response Eligible^
<b>T1 TOTAL</b>	<b>88,655</b>		
<b>A NON-Usable Numbers</b>	<b>63,740</b>		
A1 NIS/DIS/Change#/Intercepts	4,559		
A2 Non-residential #	54,727		
A3 Computer/Fax tone	3,163		
A4 Line problem	1,291		
<b>T2 Total Usable Numbers</b>	<b>24,915</b>		
<b>B UNKNOWN ELIGIBLE HOUSEHOLD*^</b>	<b>9,664</b>	<b>2,716</b>	<b>2,688</b>
B1 Probable unassigned number	3,814		
B2 No answer/Busy	2,521		
B3 Answering machine	3,329		
<b>C NOT ELIGIBLE RESPONDENT^</b>	<b>932</b>	<b>932</b>	<b>923</b>
C1 Language barrier	261		
C2 Health/Deaf	561		
C3 Respondent away for duration	110		
<b>D UNKNOWN ELIGIBLE RESPONDENT^</b>	<b>8,878</b>		<b>8,788</b>
D1 Callback	5,580		
D2 Spanish Callback not screened	28		
D3 Refusals not screened	3,270		
<b>E CONTACTS SCREENED</b>	<b>938</b>		
E1 Qualified callback	340		340
E2 Refusals – Qualified	543		543
E3 Terminates	0		0
E4 Screen-outs	55		
<b>F COMPLETE</b>	<b>4,503</b>		<b>4,503</b>
<b>A' ESTIMATED ELIGIBLE HH RATE =T2/T1</b>	<b>28.10%</b>		
<b>B' ELIGIBLE RESPONSE RATE = E+F-</b>			
<b>E4/(E+F)</b>	<b>98.99%</b>		
<b>C' SUM RESPONSE ELIGIBLE COUNT</b>			<b>17,785</b>
<b>D' RESPONSE RATE = F/C'</b>	<b>25.32%</b>		
*Estimated Qualified HH=Original Count * A'			
^Response Eligible = Qualified Household Count			
* B'			

**Figure A.2 Disposition Report for Cell Phone Sample**

	Original Count	Estimated Qualified Household*	Estimated Response Eligible^
<b>T1 TOTAL</b>	<b>46,998</b>		
<b>A NON-Usable Numbers</b>	<b>17,653</b>		
A1 NIS/DIS/Change#/Intercepts	15,445		
A2 Non-residential #	1,402		
A3 Computer/Fax tone	95		
A4 Line problem	711		
<b>T2 Total Usable Numbers</b>	<b>29,345</b>		
<b>B UNKNOWN ELIGIBLE HOUSEHOLD*^</b>	<b>11,013</b>	<b>6,876</b>	<b>4,370</b>
B1 Probable unassigned number	25		
B2 No answer/Busy	1,603		
B3 Answering machine	9,385		
<b>C NOT ELIGIBLE RESPONDENT^</b>	<b>474</b>	<b>474</b>	<b>301</b>
C1 Language barrier	218		
C2 Health/Deaf	187		
C3 Respondent away for duration	69		
<b>D UNKNOWN ELIGIBLE RESPONDENT^</b>	<b>13,332</b>		<b>8,473</b>
D1 Callback	8,655		
D2 Spanish Callback not screened	60		
D3 Refusals not screened	4,617		
<b>E CONTACTS SCREENED</b>	<b>2,315</b>		
E1 Qualified callback	330		330
E2 Refusals – Qualified	335		335
E3 Terminates	0		0
E4 Screen-outs	1,650		
<b>F COMPLETE</b>	<b>2,212</b>		<b>2,212</b>
<b>A' ESTIMATED ELIGIBLE HH RATE =T2/T1</b>	<b>62.44%</b>		
<b>B' ELIGIBLE RESPONSE RATE = E+F-</b>			
<b>C' E4/(E+F)</b>	<b>63.55%</b>		
<b>C' SUM RESPONSE ELIGIBLE COUNT</b>			<b>16,021</b>
<b>D' RESPONSE RATE = F/C'</b>	<b>13.81%</b>		
*Estimated Qualified HH=Original Count * A'			
^Response Eligible = Qualified Household Count			
* B'			

**Figure A.3 Disposition Report for Landline Oversample**

	Original Count	Estimated Qualified Household*	Estimated Response Eligible^
<b>T1 TOTAL</b>	<b>57,386</b>		
<b>A NON-Usable Numbers</b>	<b>40,460</b>		
A1 NIS/DIS/Change#/Intercepts	34,925		
A2 Non-residential #	2,826		
A3 Computer/Fax tone	2,112		
A4 Line problem	597		
<b>T2 Total Usable Numbers</b>	<b>16,926</b>		
<b>B UNKNOWN ELIGIBLE HOUSEHOLD*^</b>	<b>6,550</b>	<b>1,932</b>	<b>542</b>
B1 Probable unassigned number	1,652		
B2 No answer/Busy	2,528		
B3 Answering machine	2,370		
<b>C NOT ELIGIBLE RESPONDENT^</b>	<b>441</b>	<b>441</b>	<b>124</b>
C1 Language barrier	164		
C2 Health/Deaf	206		
C3 Respondent away for duration	71		
<b>D UNKNOWN ELIGIBLE RESPONDENT^</b>	<b>5,448</b>		<b>1,529</b>
D1 Callback	3,810		
D2 Spanish Callback not screened	107		
D3 Refusals not screened	1,531		
<b>E CONTACTS SCREENED</b>	<b>3,693</b>		
E1 Qualified callback	259		259
E2 Refusals – Qualified	206		206
E3 Terminates	0		0
E4 Screen-outs	3,228		
<b>F COMPLETE</b>	<b>794</b>		<b>794</b>
<b>A' ESTIMATED ELIGIBLE HH RATE = T2/T1</b>	<b>29.49%</b>		
<b>B' ELIGIBLE RESPONSE RATE = E+F-E4/(E+F)</b>	<b>28.06%</b>		
<b>C' SUM RESPONSE ELIGIBLE COUNT</b>			<b>3,453</b>
<b>D' RESPONSE RATE = F/C'</b>	<b>22.99%</b>		
*Estimated Qualified HH=Original Count * A'			
^Response Eligible = Qualified Household Count			
* B'			

# **Appendix B**

## **Survey Instrument**

**NHTSA National Survey of Pedestrian and Bicyclist Attitudes and Behavior  
Questionnaire**

**September 25, 2012**

QLAN. WHICH LANGUAGE IS THE INTERVIEW CONDUCTED IN

- 1 English
- 2 Spanish

**4548C: CELL SAMPLE**

SC1. Hello, I am \_\_\_\_\_ calling on behalf of the U.S. Department of Transportation. We are conducting a national study about personal transportation.

Are you currently driving?

- 1 Yes **THANK AND END**
- 2 No
- 9 Refused **THANK AND END**

SC1a. Are you in a safe place to talk right now?

- 1 Yes
- 2 No, call me later **THANK AND END**
- 3 No, CB on land-line **RECORD NUMBER**
- 4 Cell phone for business only **THANK AND END - BUSINESS#**
- 9 Refused **THANK AND END -**

SC2. I know I'm calling you on your cell phone, but we are conducting a brief survey about personal transportation and we would like to send you \$10 if you are eligible and willing to answer some questions. The survey is completely voluntary and will only take about 20 minutes. Any answers you give are kept strictly private.

[IF NECESSARY READ: Please note that an agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a current valid OMB Control Number. The OMB Control Number for this information collection is 2127-0684. If you would like to learn more about the survey, you can call our toll-free number at 1-866-780-8528 x5432 or visit the DOT website at [www.nhtsa.gov/pedbikesurvey](http://www.nhtsa.gov/pedbikesurvey).]

Are you 16 years old or older?

- 1 Yes
- 2 Yes, no time **SCHEDULE CALLBACK**
- 3 No **SCREEN OUT**
- 9 Refused **THANK AND END -**

**Qualified Level 1**

SC3. Not counting this cell phone, do you also have a regular land-line phone at home?

- 1 Cell is only phone **SKIP TO SA3**
- 2 Has regular landline phone at home
- 9 Don't know/Refused **THANK AND END**

SC4a. Of all the telephone calls that you or your family receives, are . . . (Read List)

- 1 All or almost all calls received on cell phones
- 2 Some received on cell phones and some on regular phones **(SCRN OUT: NOT CELL MOSTLY) SKIP TO SCR1**
- 3 Very few or none on cell phones **(SCRN OUT: NOT CELL MOSTLY) SKIP TO SCR1**
- 8 (VOL) Don't know **(SCRN OUT: NOT CELL MOSTLY) SKIP TO SCR1**
- 9 (VOL) Refused **(SCRN OUT: NOT CELL MOSTLY) SKIP TO SCR1**

SC4b. Thinking about just your LAND LINE home phone, NOT your cell phone, if that telephone rang when someone was home, under normal circumstances, how likely is it that the phone would be answered? Would you say it is ... (Read List)

- 1 Very likely the land line phone would be answered,
- 2 Somewhat likely,
- 3 Somewhat unlikely,
- 4 Very Unlikely, or
- 5 Not at all likely the land line phone would be answered
- 8 (VOL) Don't know
- 9 (VOL) Refused

**SKIP TO SA3**

**4548L: LAND LINE SAMPLE**

SLL1. Hello, I am \_\_\_\_\_ calling on behalf of the U.S. Department of Transportation. We are conducting a national study about personal transportation.

Just to confirm, have I reached you on a landline or a cell phone?

- 1 Landline phone **SKIP TO SL1**
- 2 Cell phone
- 3 (VOL) Voice Over IP (VOIP) or internet **SKIP TO SL1**
- 9 Refused

SLL2. Are you currently driving?

- 1 Yes **THANK AND END**
- 2 No
- 9 Refused **THANK AND END**

SLL3. Are you in a safe place to talk right now?

- 1 Yes
- 2 No, call me later **THANK AND END**
- 3 No, CB on land-line **RECORD NUMBER**
- 4 Cell phone for business only **THANK AND END - BUSINESS#**
- 9 Refused **THANK AND END**

SL1. As I mentioned I am \_\_\_\_\_ calling on behalf of the U.S. Department of Transportation. We are conducting a national study about personal transportation. This collection of information is VOLUNTARY and will be used for statistical purposes only. The interview will take approximately 20 minutes. Your participation is anonymous and we will not collect any personal information that would allow anyone to identify you.

[IF NECESSARY READ: Please note that an agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a current valid OMB Control Number. The OMB Control Number for this information collection is 2127-0684. If you would like to learn more about the survey, you can call our toll-free number at 1-866-780-8528 x5432 or visit the DOT website at [www.nhtsa.gov/pedbikesurvey](http://www.nhtsa.gov/pedbikesurvey).]

How many persons, age 16 and older, live in this household?

[ENTER NUMBER 1-10]

- 97 NONE **SCREEN OUT**
- 99 Don't know/Refused **THANK AND END**

**Qualified Level 1**

**ASK IF SL1=1.**

SL1b. May I speak with that person?

- 1 Rspn on line **SKIP TO SA3**
- 2 Rspn called to phone **GO TO SL1d**
- 3 Rspn unavailable **SCHEDULE CALLBACK**
- 9 Refused **THANK AND END**

**ASK IF SL1>1**

SL1c. In order to select just one person to interview, may I please speak to the person in your household, age 16 or older, who (has had the most recent/will have the next) birthday?

- 1 Rspn on line **GO TO SA3**
- 2 Rspn called to phone
- 3 Rspn unavailable **SCHEDULE CALLBACK**
- 9 Refused **THANK AND END**

SL1d. Hello, I am \_\_\_\_\_ calling on behalf of the U.S. Department of Transportation. We are conducting a national study about personal transportation. This collection of information is VOLUNTARY and will be used for statistical purposes only. The interview will take approximately 20 minutes. Your participation is anonymous and we will not collect any personal information that would allow anyone to identify you.

[IF NECESSARY READ: Please note that an agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a current valid OMB Control Number. The OMB Control Number for this information collection is 2127-0684. If you would like to learn more about the survey, you can call our toll-free number at 1-866-780-8528 x5432 or visit the DOT website at [www.nhtsa.gov/pedbikesurvey](http://www.nhtsa.gov/pedbikesurvey).]

Could I please confirm that you are a household member age 16 or older?

- 1 Yes
- 2 No **SCHEDULE CALLBACK**
- 9 Refused **THANK AND END**

**SKIP TO SA3**

**54320: LANDLINE OVERSAMPLE**

SOL1. Hello, I am \_\_\_\_\_ calling on behalf of the U.S. Department of Transportation. We are conducting a national study about personal transportation.

Just to confirm, have I reached you on a landline or a cell phone?

- 1 Landline phone **SKIP TO SO1**
- 2 Cell phone
- 3 (VOL) Voice Over IP (VOIP) or internet **SKIP TO SO1**
- 9 Refused

SOL2. Are you currently driving?

- 1 Yes **THANK AND END**
- 2 No
- 9 Refused **THANK AND END**

SOL3. Are you in a safe place to talk right now?

- 1 Yes
- 2 No, call me later **THANK AND END**
- 3 No, CB on land-line **RECORD NUMBER**
- 4 Cell phone for business only **THANK AND END - BUSINESS#**
- 9 Refused **THANK AND END -**

SO1. As I mentioned earlier, I am \_\_\_\_\_ calling on behalf of the U.S. Department of Transportation. We are conducting a national study about personal transportation. This collection of information is VOLUNTARY and will be used for statistical purposes only. The interview will take approximately 20 minutes. Your participation is anonymous and we will not collect any personal information that would allow anyone to identify you.

[IF NEEDED: Please note that an agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a current valid OMB Control Number. The OMB Control Number for this information collection is 2127-0684. If you would like to learn more about the survey, you can call our toll-free number at 1-866-780-8528 X5432 or visit the DOT website at [www.nhtsa.gov/pedbikesurvey](http://www.nhtsa.gov/pedbikesurvey).]

How many persons, age 16 to 39, live in this household?

[ENTER NUMBER 1-10]

97 NONE

**SCREEN OUT**

99 Don't know/Refused

**THANK AND END**

**Qualified Level 1**

**ASK IF S01=1.**

S01b. May I speak with that person?

1 Rspn on line

**SKIP TO SA3**

2 Rspn called to phone

**GO TO S01d**

3 Rspn unavailable

**SCHEDULE CALLBACK**

9 Refused

**THANK AND END**

**ASK IF S01>1**

S01c. In order to select just one person to interview, may I please speak to the person in your household, age 16 to 39, who (has had the most recent/will have the next) birthday?

1 Rspn on line

**GO TO SA3**

2 Rspn called to phone

**SCHEDULE CALLBACK**

3 Rspn unavailable

9 Refused

**THANK AND END**

S01d. Hello, I am \_\_\_\_\_ calling on behalf of the U.S. Department of Transportation. We are conducting a national study about personal transportation. This collection of information is VOLUNTARY and will be used for statistical purposes only. The interview will take approximately 20 minutes. Your participation is anonymous and we will not collect any personal information that would allow anyone to identify you.

[IF NEEDED: If you would like to learn more about the survey, you can call our toll-free number at 1-866-780-8528 X 5432 or visit the DOT website at [www.nhtsa.gov/pedbikesurvey](http://www.nhtsa.gov/pedbikesurvey). Please note that an agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a current valid OMB Control Number. The OMB Control Number for this information collection is 2127-0684.]

Could I please confirm that you are a household member age 16 to 39?

1 Yes

2 No

**SCHEDULE CALLBACK**

9 Refused

**THANK AND END**

SA3. Record gender from observation. **(Ask only if necessary)**

- 1 Male
- 2 Female

**Qualified Level 2**

1 When was the last time you rode a bicycle? Do not include stationary bikes. (READ LIST)

- 1 Within the past week
- 2 Within the past month, but not the past week
- 3 Within the past year, but not past month
- 4 1-2 years ago
- 5 3-5 years ago
- 6 More than 5 years ago (Skip to #31)
- 7 Never (Skip to #31)
- 8 **Can't ride bike/Disabled** (Skip to #31)
- 9 98 (VOL) Don't know (Skip to #31)
- 10 99 (VOL) Refused (Skip to #31)

2 Do you have a bicycle available for your use? Again, do not include stationary bikes.

- 1 Yes
- 2 No (Skip to instruction before #4)
- 8 (VOL) Don't know (Skip to instruction before #4)
- 9 (VOL) Refused (Skip to instruction before #4)

**If #1 = 1 or 2, skip to #4**

3 Why haven't you ridden a bicycle recently? **(Multiple Record) (Open ended and code)**

- 1 Bad weather
- 2 Too busy, no opportunity
- 3 Bike is broken
- 4 No safe place to ride
- 5 Disability/other health impairment
- 6 Other transportation is faster
- 7 Don't know how to ride a bike
- 8 Other (specify)
- 98 (VOL) Don't know
- 99 (VOL) Refused

**Continue if #1 = 1 or 2. Otherwise skip to #20.**

4. Thinking about the past 30 days, about how many of those days did you ride a bicycle? **(Open ended and code actual number)**

- 00 None (Skip to #20)

01-  
31

98 (VOL) Don't know  
99 (VOL) Refused

5 The last day you rode a bicycle, was it on a weekday or the weekend?

1 Weekday (Monday - Friday)  
2 Weekend (Saturday or Sunday)  
8 (VOL) Don't know  
9 (VOL) Refused

**INTERVIEWER NOTE: READ SLOWLY:)**

I would now like to know about EACH of the individual trips that you made on the last day you rode a bicycle. A TRIP is defined as going from a starting point to a destination for a specific purpose. If you left your house to go on a bike ride with no real destination and returned to your house that would be ONE trip. If you rode from your house to a friend's house for a visit, then rode back home, that would be TWO trips. If you rode from your home to a friend's house, then to a store, and then back home again, that would count as THREE trips. I am going to ask about these individual trips one at a time.

6. Thinking of this last day that you rode your bike, what was your starting point for your first trip of the day? **(DO NOT READ LIST)**

- 1 Home
- 2 Friend or relative's home
- 3 Work
- 4 School/Campus
- 5 Park/field
- 6 Grocery store/Drug store/Convenience store
- 7 Mall/Strip mall/Shopping center
- 8 Restaurant
- 9 Train/subway/bus station or stop
- 10 Rental spot
- 11 Other (Specify)
- 98 (VOL) Don't know
- 99 (VOL) Refused

7. What was the main purpose of this trip? **(DO NOT READ LIST)**

- 1 Commuting to/from work
- 2 Commuting to/from school
- 3 Recreation
- 4 Exercise/for my health
- 5 Personal errands (to/from the store, post office, and so on)
- 6 Required for my job
- 7 Drop off/Pick up someone
- 8 Visit a friend or relative
- 9 Other (Specify)
- 98 (VOL) Don't know
- 99 (VOL) Refused

8. Where did this trip end? **(DO NOT READ LIST)**

- 1 Home
- 2 Friend or relative's home
- 3 Work
- 4 School/Campus
- 5 Park/field
- 6 Grocery store/Drug store/Convenience store
- 7 Mall/Strip mall/Shopping center
- 8 Restaurant
- 9 Train/subway/bus station or stop
- 10 Rental spot
- 11 Other (Specify)
- 98 (VOL) Don't know/A location you cannot remember
- 99 (VOL) Refused/A location you prefer not to share

**PROGRAMMER NOTE: LIMIT TO 6 TRIPS MAXIMUM**

9. Did you take any more bike trips on this day?

- 1 Yes
- 2 No (Skip to #14)
- 8 (VOL) Don't know (Skip to #14)
- 9 (VOL) Refused (Skip to #14)

(PROGRAMMER NOTE: Ask #9-#13 for each trip before going to the next trip, if applicable)

IF Q8=98/99 OR Q13=98/99, READ: "Now, I'll ask you about your (read A-E, as appropriate) trip." AND SKIP TO Q11.

10. Now, I'll ask you about your (read A-E, as appropriate) trip. You just mentioned you ended your last trip at (a) (response in #8 or #13 A-D, as appropriate). Is this where you started your (read A-E) trip of the day?

- 1 Yes
  - 2 No
  - 8 (VOL) Don't know
  - 9 (VOL) Refused
- 
- A. (If First Loop, ask:) Second
  - B. (If Second Loop, ask:) Third
  - C. (If Third Loop, ask:) Fourth
  - D. (If Fourth Loop, ask:) Fifth
  - E. (If Fifth Loop, ask:) Sixth

(For each code 1 in #10 A-E,  
Autocode response from #8 or #13 A-D, as appropriate  
into #11 A-E, as appropriate AND Skip to #12;  
Otherwise, Continue)

11. What was your starting point for this trip? (Display A-E, as appropriate) (DO NOT READ LIST)

- 1 Home
- 2 Friend or relative's home
- 3 Work
- 4 School/Campus
- 5 Park/field
- 6 Grocery store/Drug store/Convenience store
- 7 Mall/Strip mall/Shopping center
- 8 Restaurant
- 9 Train/subway/bus station or stop
- 10 Rental spot
- 11 Other (Specify)
- 98 (VOL) Don't know
- 99 (VOL) Refused

- A. (If First Loop, ask:) Second
- B. (If Second Loop, ask:) Third
- C. (If Third Loop, ask:) Fourth
- D. (If Fourth Loop, ask:) Fifth
- E. (If Fifth Loop, ask:) Sixth

12. What was the main purpose of this trip? (Display A-E, as appropriate) (DO NOT READ LIST)

- 1 Commuting to/from work
- 2 Commuting to/from school
- 3 Recreation
- 4 Exercise/for my health
- 5 Personal errands (to/from the store, post office, and so on)
- 6 Required for my job
- 7 Drop off/Pick up someone
- 8 Visit a friend or relative
- 9 Other (specify)
- 98 (VOL) Don't know
- 99 (VOL) Refused

- A. (If First Loop, ask:) Second
- B. (If Second Loop, ask:) Third
- C. (If Third Loop, ask:) Fourth
- D. (If Fourth Loop, ask:) Fifth
- E. (If Fifth Loop, ask:) Sixth

13. Where did this trip end? (Display A-E, as appropriate) (DO NOT READ LIST)

- 1 Home
- 2 Friend or relative's home
- 3 Work
- 4 School/Campus
- 5 Park/field
- 6 Grocery store/Drug store/Convenience store
- 7 Mall/Strip mall/Shopping center
- 8 Restaurant
- 9 Train/subway/bus station or stop
- 10 Rental spot
- 11 Other (Specify)
- 98 (VOL) Don't know/A location you cannot remember
- 99 (VOL) Refused/A location you prefer not to share

- A. (If First Loop, ask:) Second
- B. (If Second Loop, ask:) Third
- C. (If Third Loop, ask:) Fourth
- D. (If Fourth Loop, ask:) Fifth
- E. (If Fifth Loop, ask:) Sixth

14. When you rode your bicycle THAT DAY, did you ride mostly on **(READ LIST)**? **SINGLE RECORD. READ IF NECESSARY:** A bike lane refers to a lane on the side of a road designated for bicyclists. A bike path refers to a path, not along a roadway, which can be used by bicyclists.

- 1 Paved roads, not on shoulder
- 2 Shoulders of paved roads
- 3 Bike lanes on roads
- 4 Sidewalks **(Skip to #16)**
- 5 Bike paths, walking paths or trails **(Skip to #16)**
- 6 Unpaved roads (e.g., dirt, gravel, sand)
- 7 Or some other surface (Specify) **(Skip to #16)**
- 8 (VOL) Don't know
- 9 (VOL) Refused

15. When riding your bike in the road, did you mostly ride. . .?(READ LIST)

- 1 Facing traffic, that is, riding against the direction of the cars, or
- 2 With traffic, that is riding in the same direction as the cars
- 3 (VOL) Varies/Depends
- 4 (VOL) Not applicable/Never ride in the road
- 8 (VOL) Don't know
- 9 (VOL) Refused

16. Was anyone else with you when you were riding your bicycle that day, or was all of your riding done alone?

- 1 Rode with others
- 2 Rode alone
- 8 (VOL) Don't know
- 9 (VOL) Refused

17. Did you feel threatened for your personal safety at any time when you rode your bike that day?

- 1 Yes **(Continue)**
- 2 No **(Skip to #20)**
- 8 (VOL) Don't know **(Skip to #20)**
- 9 (VOL) Refused **(Skip to #20)**

18. Did you feel threatened for your personal safety because of any of the following? How about (read and rotate A-D, then E)?

- 1 Yes
- 2 No
- 8 (VOL) Don't know
- 9 (VOL) Refused

A. Motorists

B. The potential for crime

C. Uneven walkways or roadway surfaces

D. Dogs or other animals

E. Something else? (If "Yes", ask:) What else? (Open ended)  
[MULTIPLE RESPONSE]

- 1 Too much bicycle or pedestrian traffic
- 2 Lack of room to ride
- 3 Obstacles blocking path
- 4 Not maintained
- 5 No/Nothing else
- 6 Other (Specify)
- 8 (VOL) Don't know
- 9 (VOL) Refused

If code 1 in #18A, Continue; Otherwise, Skip to #20)

19. What did motorists do to make you feel threatened?  
**(DO NOT READ LIST) (Multiple Record)**

- 1 Cut me off
- 2 Entered intersection without looking
- 3 Drove very close to me
- 4 Honked at me
- 5 Almost hit me/near miss
- 6 Just the presence of the motorist was threatening
- 7 Too fast
- 8 Other (Specify)
- 98 (VOL) Don't know
- 99 (VOL) Refused

20. Now I'd like to find out how people learn about bicycling safety. In the past five years, have you received any training in bicycling safety?

- 1 Yes
- 2 No (Skip to #22)
- 8 (VOL) Don't know (Skip to #22)
- 9 (VOL) Refused (Skip to #22)

21. Who provided the training to you? (DO NOT READ LIST)

- 1 Bicycle store
- 2 Police
- 3 Friends
- 4 Teachers/schools
- 5 Bicycle club
- 6 State/Local bike programs
- 7 Family
- 8 Other (Specify)
- 98 (VOL) Don't know
- 99 (VOL) Refused

22. If you wanted to learn (if #20 = 1, insert the word "more") about bicycling safety, where would you go or look for information? (DO NOT READ LIST) (Multiple Record)

- 1 Bicycle store
- 2 Department of Motor Vehicles
- 3 Police
- 4 Automobile Association
- 5 Teachers/Schools
- 6 Bicycle Club
- 7 State/Local Bike programs
- 8 Book/Magazine/Video Store
- 9 Internet
- 10 Family
- 11 NHTSA
- 12 Other (Specify)
- 98 (VOL) Don't know
- 99 (VOL) Refused

Continue if #1 = 1, 2, or 3. Otherwise skip to #31.

23. During the past year, how much of your biking was done when it was dark or nearly dark outside? **READ LIST. SINGLE RECORD.**

- 1 Nearly all
- 2 More than half
- 3 About half
- 4 Some
- 5 Almost none
- 6 None
- 8 (VOL) Don't know
- 9 (VOL) Refused

**(If code 1-4 in #23, Continue;  
Otherwise, Skip to #26)**

24. When you ride your bike after dark, do you do anything to make yourself more visible to motorists?

- 1 Yes (Continue)
- 2 No (Skip to #26)
- 3 (VOL) Don't know (Skip to #26)
- 4 (VOL) Refused (Skip to #26)

25. What do you do to make yourself or your bike more visible after dark? **(DO NOT READ LIST) (Multiple Record)**

- 1 Use bike headlight
- 2 Use bike taillight
- 3 Wear fluorescent or reflective clothing/shoes
- 4 Wear other lights on self or belongings
- 5 Ensure bicycle has reflectors
- 6 Ride only in well-lit areas
- 7 Other (Specify)
- 8 (VOL) Don't know
- 9 (VOL) Refused

26. During the past year, how often did you use an electronic device like a cell phone or mp3 player WHILE YOU WERE RIDING YOUR BIKE and the bike was in motion? Did you use an electronic device during:  
[READ LIST]

- 1 Nearly all of your bike trips
- 2 More than half of your bike trips
- 3 About half of your bike trips
- 4 Some of your bike trips
- 5 Almost none of your bike trips, or
- 6 None of your bike trips
- 7 Other (Specify)
- 8 (VOL) Don't know
- 9 (VOL) Refused

### GENERAL BICYCLE HABITS

**(READ:)** Now I would like to know about your biking habits.

27. On average during the summer months, how often do you use a bicycle? **(Read 1-4) (If necessary, read:)** Summer months are May through September.

- 1 *At least once a week*
- 2 At least once a month, but not weekly
- 3 Less than once a month, but at least once during the summer
- 4 Never
- 8 (VOL) Don't know
- 9 (VOL) Refused

28. On a typical day that you ride a bicycle, about how long do you ride? Don't count any stops - just the average amount of time you travel on your bike. **(Open ended and code time)**

Hours: \_\_\_\_\_ and Minutes: \_\_\_\_\_ **SKIP TO Q30**

- 97 [Volunteered: It differs too much to say]
- 98 (Don't Know)
- 99 (Refused) **SKIP TO Q30**

29. Can you tell me if it was . . .[READ LIST]

- 1 Less than 30 minutes,
- 2 30 minutes to one hour,
- 3 One to two hours, or
- 4 More than two hours?
- 8 (VOL) Don't know
- 9 (VOL) Refused

30. Compared to about a year ago, would you say you are now riding a bike more often, less often or about the same amount?

- 1 More often
- 2 Same amount
- 3 Less often
- 8 (VOL) Don't know
- 9 (VOL) Refused

31. Are bike PATHS, that is, paths away from the road on which bikes can travel, available within a quarter mile of where you live?

- 1 Yes
- 2 No
- 3 (VOL) Don't know
- 4 (VOL) Refused

**IF Q1>3, SKIP TO Q34**

32. Do you ride on bike paths . . . ? [READ LIST]

- 1 Every time you ride a bike (Skip to #34)
- 2 Most of the time (Skip to #34)
- 3 Some of the time (Skip to #34)
- 4 Hardly ever, OR
- 5 Never
- 8 (VOL) Don't know (Skip to #34)
- 9 (VOL) Refused (Skip to #34)

**IF Q31>1, SKIP TO Q34**

33. What is the main reason that you choose not to use the bike paths?  
**(Open ended and code) (INTERVIEWER NOTE: If respondent says, 'Don't like them', probe for why) DO NOT READ LIST. SINGLE RECORD.**

- 1 Not in good repair
- 2 Don't go where I need to go
- 3 Too crowded with bicycles or pedestrians
- 4 Don't feel safe
- 5 Other (Specify)
- 8 (VOL) Don't know
- 9 (VOL) Refused

34. Are bike LANES, that is, marked lanes on a public road reserved for bikes to travel, available within a quarter mile of where you live?

- 1 Yes
- 2 No
- 8 (VOL) Don't know
- 9 (VOL) Refused

**IF Q1>3, SKIP TO Instruction before Q37**

35. Do you ride in bike LANES...? [READ LIST]

- 1 Every time you ride a bike (Skip to Instr before #37)
- 2 Most of the time (Skip to Instr before #37)
- 3 Some of the time (Skip to Instr before #37)
- 4 Hardly ever, OR
- 5 Never
- 8 (VOL) Don't know (Skip to Instr before #37)
- 9 (VOL) Refused (Skip to Instr before #37)

**IF Q34>1, SKIP TO Instruction before Q37**

36. What is the main reason that you choose not to use the bike lanes?  
**(Open ended and code) (INTERVIEWER NOTE: If respondent says, 'Don't like them', probe for why) DO NOT READ LIST. SINGLE RECORD.**

- 1 Not in good repair
- 2 Don't go where I need to go
- 3 Too crowded with bicycles or pedestrians
- 4 Don't feel safe
- 5 Other (Specify)
- 8 (VOL) Don't know
- 9 (VOL) Refused

**If #1 = 1, 2, or 3, continue.**

**If #1 = 4, skip to #38.**

**If #1 > 4, skip to #43.**

37. When you are bicycling, how often do you have to change your route because of obstacles, such as construction, heavy traffic, and roads in poor condition? Does this happen nearly all of the time, most, some, or almost none of the time?

**(INTERVIEWER NOTE: READ IF NECESSARY: Obstacles refer to any physical object which would cause the rider to detour off their intended path and are not limited to the examples given above.)**

- 1 Nearly all of the time
- 2 Most of the time
- 3 Some of the time
- 4 Almost none of the time
- 8 (VOL) Don't Know
- 9 (VOL) Refused

38. In the past two years, were you ever injured while you were riding a bike? Only count injuries that required attention by a medical professional.

- 1 Yes
- 2 No **(Skip to instruction before #41)**
- 8 (VOL) Don't Know **(Skip to instruction before #41)**
- 9 (VOL) Refused **(Skip to instruction before #41)**

39. Was this injury a result of being hit by a motor vehicle?

- 1 Yes **(Skip to instruction before #41)**
- 2 No
- 8 (VOL) Don't Know **(Skip to instruction before #41)**
- 9 (VOL) Refused **(Skip to instruction before #41)**

40. How did you injure yourself while riding your bike? **(Open ended and code)**

Specify \_\_\_\_\_.

98 (Don't Know)

99 (Refused)

**If #1 > 3, skip to #43. Otherwise continue.**

41. When riding a bike, do you wear a helmet for . . . ? (READ LIST)

- 1 All of your rides
- 2 Nearly all of your rides
- 3 Most of your rides
- 4 Some of your rides
- 5 Not very many of your rides
- 6 Never
- 8 (VOL) Don't Know
- 9 (VOL) Refused

**(If code 1 in #41, Skip to #43;  
Otherwise, Continue)**

Now, I am going to read a list of reasons people give when asked why they do not wear a bike helmet.

42. What are the reasons you don't always wear a bike helmet? Please answer Yes or No after I read each one. Is it because **(read and rotate A-I, then read J)**?

- 1 Yes
- 2 No
- 8 (VOL) Don't Know
- 9 (VOL) Refused

- A. You forget to wear it
- B. You don't think helmets provide much protection in case of accident
- C. You don't like the way you look when you wear a helmet
- D. Helmets obstruct your vision
- E. Helmets are uncomfortable

- F. You don't wear a helmet for short trips
- G. It's too hot wearing a helmet
- H. Helmets cost too much
- I. You don't have a helmet
- J. Some other reason? **(If "Yes", ask:)** What other reason? (Open ended and code)

- 1 Don't need to wear one
- 2 No/No other reason
- 3 Other (Specify)
- 8 (VOL) Don't Know
- 9 (VOL) Refused

43. In your opinion, how much protection against HEAD injuries do bike helmets provide children? Would you say bike helmets provide children very little protection, some protection, or a lot of protection against head injuries?

- 1 Very little protection
- 2 Some protection
- 3 A lot of protection
- 8 (VOL) Don't Know
- 9 (VOL) Refused

44. What about for adults? Do bike helmets provide adults very little protection, some protection, or a lot of protection against HEAD injuries?

- 1 Very little protection
- 2 Some protection
- 3 A lot of protection
- 8 (VOL) Don't Know
- 9 (VOL) Refused

**IF Q1=8, SKIP TO Q47**

45. How satisfied are you with how your local community is designed for making bike riding safe? Are you . . . ? [READ LIST]

- 1 Very satisfied
- 2 Somewhat satisfied
- 3 Neither satisfied nor dissatisfied
- 4 Somewhat dissatisfied
- 5 Very dissatisfied
- 8 (VOL) Don't Know
- 9 (VOL) Refused

46. What changes, if any, would you like to see your local government make in your community for bicyclists? **(DO NOT READ LIST) (Multiple Record)**

- 1 More bike trails
- 2 More bike paths
- 3 More bike lanes
- 4 Allow bikes on sidewalks
- 5 Don't allow bikes on sidewalks
- 6 Other (specify)
- 7 None, can't think of any
- 8 (VOL) Don't Know
- 9 (VOL) Refused

47. Is there a law or ordinance in your state, city, or county that requires adults and/or children to wear a helmet when riding a bike?

- 1 Yes
- 2 No **(Skip to #50)**
- 8 (VOL) Don't Know **(Skip to #50)**
- 9 (VOL) Refused **(Skip to #50)**

48. Is it a state, city, or county law? **MULTIPLE RECORD.**
- 1 State law
  - 2 City law
  - 3 County law
  - 4 Other (specify)
  - 8 (VOL) Don't Know
  - 9 (VOL) Refused
49. Does this law require all bicyclists, or only children, to wear helmets?
- 1 All bicyclists
  - 2 Only children
  - 8 (VOL) Don't Know
  - 9 (VOL) Refused
50. Do you favor or oppose laws that require **(read and rotate A-B)**?
- A. Children to wear helmets whenever they are riding a bike
  - B. Adults to wear helmets whenever they are riding a bike
- 1 Favor
  - 2 Oppose
  - 3 (VOL) It depends (Specify)
  - 8 (VOL) Don't Know/No opinion
  - 9 (VOL) Refused

**PEDESTRIANS :**

**GENERAL**

**(READ:)** This next section is about walking rather than biking. By walking we mean any outdoor walking, jogging, or running that lasts at least 5 minutes or more. **(INTERVIEWER NOTE: If respondent asks, they should NOT include roller-blading, roller-skating, skateboarding and scooter use) [INTERVIEWER NOTE: Each trip should start at the point where the respondent was on foot (either walking, jogging or running) and end at their next destination.**

51. When was the last time you walked, jogged, or ran outside for 5 minutes or more? **(Open ended and code time frame) [READ LIST]**

- 1 Within the past week **(Continue)**
- 2 Within the past month, but not the past week **(Continue)**
- 3 Within the past year, but not past month **(Skip to #68)**
- 4 1-2 years ago **(Skip to Read before #74)**
- 5 3-5 years ago **(Skip to Read before #74)**
- 6 More than 5 years ago **(Skip to Read before #74)**
- 7 (VOL) Never **(Skip to Read before #74)**
- 8 (VOL) Cannot walk/disabled **(Skip to Read before #74)**
- 98 (VOL) Don't Know **(Skip to Read before #74)**
- 99 (VOL) Refused **(Skip to Read before #74)**

52. Thinking about the past 30 days, about how many of those days did you walk, jog, or run outside? **(Open ended and code actual number)**

- 00 None **(Skip to #68)**
- 01-  
31
- 98 (VOL) Don't Know
- 99 (VOL) Refused

53. The last day you walked, jogged, or ran outside for 5 minutes or more, was it on a weekday or the weekend?

- 1 Weekday (Monday - Friday)
- 2 Weekend (Saturday or Sunday)
- 8 (VOL) Don't Know
- 9 (VOL) Refused

**(INTERVIEWER NOTE: READ SLOWLY:)**

I would now like to know about EACH of the individual trips that you made on the last day you walked. A TRIP is defined as going from a starting point to a destination for a specific purpose. If you left your house on a walk with no real destination and returned to your house that would be ONE trip. If you walked from your house to a friend's house for a visit, then walked back home, that would be TWO trips. If you walked from your home to a friend's house, then to a store, and then back home again, that would count as THREE trips. I am going to ask about these individual trips one at a time.

54. What was your starting point for your first trip of the day?

**(DO NOT READ LIST)**

**Each trip should start at the point where you were on foot, either walking, jogging or running, and end at your next destination.**

- 1 Home
- 2 Friend or relative's home
- 3 Work
- 4 School/Campus
- 5 Park/field
- 6 Grocery store/Drug store/Convenience store
- 7 Mall/Strip mall/Shopping center
- 8 Restaurant
- 9 Train/subway/bus station or stop
- 10 Other (Specify)
- 98 (VOL) Don't Know
- 99 (VOL) Refused

55. What was the main purpose of this trip? **(DO NOT READ LIST)**

- 1 Commuting to/from work
- 2 Commuting to/from school
- 3 Recreation
- 4 Exercise/for my health
- 5 Personal errands (to/from the store, post office, and so on)
- 6 Required for my job
- 7 Drop off/Pick up someone
- 8 Visit a friend or relative
- 9 Walk the dog
- 10 Escort child to school
- 11 Other (Specify)
- 98 (VOL) Don't Know
- 99 (VOL) Refused

56. Where did this trip end? **(DO NOT READ LIST)**

- 1 Home
- 2 Friend or relative's home
- 3 Work
- 4 School/Campus
- 5 Park/field
- 6 Grocery store/Drug store/Convenience store
- 7 Mall/Strip mall/Shopping center
- 8 Restaurant
- 9 Train/subway/bus station or stop
- 10 Other (Specify)
- 98 (VOL) Don't Know/A location you cannot remember
- 99 (VOL) Refused/A location you prefer not to share

57. Did you take any more walking trips on this day? Again I want you to include jogging and running trips in addition to walking trips.

- 1 Yes
- 2 No **(Skip to #62)**
- 8 (VOL) Don't Know **(Skip to #62)**
- 9 (VOL) Refused **(Skip to #62)**

(PROGRAMMER NOTE: Ask #57-#61 for each trip before going to the next trip, if applicable)

IF Q56=98/99 OR Q61=98/99 READ: "Now, I'll ask you about your (read A-E, as appropriate) trip." AND SKIP TO Q59.

58. Now, I'll ask you about your (read A-E, as appropriate) trip. You just mentioned you ended your last trip at (a) (response in #56 or #61 A-D, as appropriate). Is this where you started your (read A-E) trip of the day?

- 1 Yes
- 2 No
- 8 (VOL) Don't Know
- 9 (VOL) Refused

- A. (If First Loop, ask:) Second
- B. (If Second Loop, ask:) Third
- C. (If Third Loop, ask:) Fourth
- D. (If Fourth Loop, ask:) Fifth
- E. (If Fifth Loop, ask:) Sixth

(For each code 1 in #58 A-E,  
Autocode response from #56 or #61 A-D, as appropriate  
into #59 A-E, as appropriate AND Skip to #60;  
Otherwise, Continue)

59. What was your starting point for this trip? (Display A-E, as appropriate) (DO NOT READ LIST)

- 1 Home
- 2 Friend or relative's home
- 3 Work
- 4 School/Campus
- 5 Park/field
- 6 Grocery store/Drug store/Convenience store
- 7 Mall/Strip mall/Shopping center
- 8 Restaurant
- 9 Train/subway/bus station or stop
- 10 Other (Specify)
- 98 (VOL) Don't Know
- 99 (VOL) Refused

A. (If First Loop, ask:) Second

B. (If Second Loop, ask:) Third

C. (If Third Loop, ask:) Fourth

D. (If Fourth Loop, ask:) Fifth

E. (If Fifth Loop, ask:) Sixth

60. What was the main purpose of this trip? (Display A-E, as appropriate) (DO NOT READ LIST)

- 1 Commuting to/from work
- 2 Commuting to/from school
- 3 Recreation
- 4 Exercise/for my health
- 5 Personal errands (to/from the store, post office, and so on)
- 6 Required for my job
- 7 Drop off/Pick up someone
- 8 Visit a friend or relative
- 9 Walk the dog
- 10 Escort child to school
- 11 Other (Specify)
- 98 (VOL) Don't Know
- 99 (VOL) Refused

- A. (If First Loop, ask:) Second
- B. (If Second Loop, ask:) Third
- C. (If Third Loop, ask:) Fourth
- D. (If Fourth Loop, ask:) Fifth
- E. (If Fifth Loop, ask:) Sixth

61. Where did this trip end? (Display A-E, as appropriate) (Open ended and code)

- 1 Home
- 2 Friend or relative's home
- 3 Work
- 4 School/Campus
- 5 Park/field
- 6 Grocery store/Drug store/Convenience store
- 7 Mall/Strip mall/Shopping center
- 8 Restaurant
- 9 Train/subway/bus station or stop
- 10 Other (Specify)
- 98 (VOL) Don't Know/A location you cannot remember
- 99 (VOL) Refused/A location you prefer not to share

A. (If First Loop, ask:) Second

B. (If Second Loop, ask:) Third

C. (If Third Loop, ask:) Fourth

D. (If Fourth Loop, ask:) Fifth

E. (If Fifth Loop, ask:) Sixth

62. When you were walking, jogging or running THAT DAY, did you walk, jog or run mostly on . . . ? [READ LIST]

- 1 Paved roads, not on shoulder
- 2 Shoulders of paved roads
- 3 Grass or fields (Skip to #64)
- 4 Sidewalks (Skip to #64)
- 5 Bike paths, walking paths or trails (Skip to #64)
- 6 Unpaved roads (for example dirt, gravel, sand)
- 7 Or some other surface (Specify) (Skip to #64)
- 8 (VOL) Don't Know (Skip to #64)
- 9 (VOL) Refused (Skip to #64)

63. When you were walking, jogging, or running (in the road/on the shoulder), were you usually walking, jogging or running . . . ? [READ LIST]

- 1 Facing traffic, that is, walking against traffic, or
- 2 With traffic, that is walking in the same direction as the cars
- 3 (VOL) Varies/Depends
- 4 (VOL) Not applicable/Never walk in the road
- 8 (VOL) Don't Know
- 9 (VOL) Refused

64. Was anyone else with you when you were walking, jogging, or running, or was all your walking, jogging, or running done alone?

- 1 Walked with others
- 2 Walked alone
- 8 (VOL) Don't Know
- 9 (VOL) Refused

65. Did you feel threatened for your personal safety at any time while walking, jogging or running that day?

- 1 Yes
- 2 No (Skip to #68)
- 8 (VOL) Don't Know (Skip to #68)
- 9 (VOL) Refused (Skip to #68)

66. Did you feel threatened for your personal safety because of any of the following? How about (read and rotate A-D, then E)?

- 1 Yes
- 2 No
- 8 (VOL) Don't Know
- 9 (VOL) Refused

A. Motorists

B. The potential for crime

C. Uneven walkways or road surfaces

D. Dogs or other animals

E. Something else? (If "Yes", ask:) What else?  
**(DO NOT READ LIST)** [MULTIPLE RESPONSE]

- 1 Too much bicycle or pedestrian traffic
- 2 Lack of room to walk or run
- 3 Obstacles blocking path
- 4 Not maintained
- 5 No/Nothing else
- 6 Other (Specify)
- 8 (VOL) Don't Know
- 9 (VOL) Refused

(If code 1 in #66-A, Continue;  
Otherwise, Skip to #68)

67. What did motorists do to make you feel threatened?  
**DO NOT READ LIST (Multiple Record)**

- 1 Cut me off
- 2 Entered intersection without looking
- 3 Drove very close to me
- 4 Honked at me
- 5 Almost hit me/near miss
- 6 Just the presence of the motorist was threatening
- 7 Too fast
- 8 Other (Specify)
- 98 (VOL) Don't Know
- 99 (VOL) Refused

68. During the past year, how much of your walking was done when it was dark or nearly dark outside?

- 1 Nearly all
- 2 More than half
- 3 About half
- 4 Some
- 5 Almost none
- 6 None
- 8 (VOL) Don't Know
- 9 (VOL) Refused

**(If code 1-4 in #68, Continue;  
Otherwise, Skip to #71)**

69. When you walk after dark, do you do anything to make yourself more visible to motorists?

- 1 Yes
- 2 No (Skip to #71)
- 8 (VOL) Don't Know (Skip to #71)
- 9 (VOL) Refused (Skip to #71)

70. What do you do to make yourself more visible when walking after dark? **(DO NOT READ LIST) (Multiple Record)**

- 1 Wear light colored clothing
- 2 Wear fluorescent or reflective clothing/Shoes
- 3 Wear or carry a flashlight
- 4 Walk only in well-lit areas
- 5 Other (list)
- 8 (VOL) Don't Know
- 9 (VOL) Refused

71. During the past year, how often did you use an electronic device like a cell phone or mp3 player WHILE YOU WERE walking outside? Do not count instances when you stopped walking. Did you use an electronic device during: [READ LIST]

- 1 Nearly all of your outdoor walking trips
- 2 More than half of your walking trips
- 3 About half of your walking trips
- 4 Some of your walking trips
- 5 Almost none of your walking trips, or
- 6 None of your walking trips
- 7 Other (Specify)
- 8 (VOL) Don't Know
- 9 (VOL) Refused

**GENERAL WALKING HABITS**

**(READ:)** Now I would like to know about your walking habits.

72. On average during the summer months, how often do you walk? **(Read 1-4) (If necessary, read:)** Summer months are May through September.

- 1 *At least once a week*
- 2 *At least once a month, but not weekly*
- 3 *Less than once a month, but at least once during the summer*
- 4 *Never*
- 8 (VOL) Don't Know
- 9 (VOL) Refused

73. Compared to about a year ago, would you say you are now walking more often, less often or about the same amount?

- 1 More often
- 2 Same amount
- 3 Less often
- 8 (VOL) Don't Know
- 9 (VOL) Refused

Now I'd like you to think of the neighborhood where you live.

74. Are there sidewalks in your neighborhood **(Read 1-4)**:

- 1 Along almost all streets
- 2 Along most streets
- 3 Along some streets, or
- 4 Along no streets **(Skip To Instruction before Q78)**
- 8 (VOL) Don't Know
- 9 (VOL) Refused

75. In what condition are these sidewalks? Are they in excellent, good, fair, or poor condition?

- 1 Excellent
- 2 Good
- 3 Fair
- 4 Poor
- 8 (VOL) Don't Know
- 9 (VOL) Refused

**If #51 = 4, skip to instruction before #78**  
**If #51 > 4, skip to Instruction before #81**

76. Do you use sidewalks . . . ? [READ LIST]

- 1 Every time you walk, jog or run outside **(Skip to instr before #78)**
- 2 Most of the time **(Skip to instr before #78)**
- 3 Some of the time **(Skip to instr before #78)**
- 4 Hardly ever, OR
- 5 Never
- 6 (VOL) It depends if I am walking or jogging/running **(Skip to instr before #78)**
- 8 (VOL) Don't Know **(Skip to instr before #78)**
- 9 (VOL) Refused **(Skip to instr before #78)**

77. What is the main reason that you hardly ever or never use sidewalks? **(DO NOT READ LIST)**  
**(INTERVIEWER NOTE: If respondent says, Don't like them; Probe for why)**

- 1 Not in good repair
- 2 Don't go where I need to go
- 3 Too crowded
- 4 Prefer softer surface
- 5 Don't feel safe
- 6 Other (Specify)
- 8 (VOL) Don't Know
- 9 (VOL) Refused

**IF Q51>4, SKIP TO Instruction before Q81**

78. In the past two years, were you ever injured while you were walking? Only count injuries that required attention by a medical professional.

- 1 Yes
- 2 No **(Skip to instr before #81)**
- 8 (VOL) Don't Know **(Skip to instr before #81)**
- 9 (VOL) Refused **(Skip to instr before #81)**

79. Was this injury a result of being hit by a motor vehicle?

- 1 Yes **(Skip to instr before #81)**
- 2 No
- 8 (VOL) Don't Know **(Skip to instr before #81)**
- 9 (VOL) Refused **(Skip to instr before #81)**

80. How did you injure yourself while you were walking?  
**(Open ended and code)**

- Specify \_\_\_\_\_.
- 98 (Don't Know)
  - 99 (Refused)

**IF Q51=8, SKIP TO Intro before Q83**

81. How satisfied are you with how your local community is designed for making walking safe? Are you . . . ? [READ LIST]

- 1 Very satisfied
- 2 Somewhat satisfied
- 3 Neither satisfied nor dissatisfied
- 4 Somewhat dissatisfied
- 5 Very dissatisfied
- 8 (VOL) Don't Know
- 9 (VOL) Refused

82. What changes, if any, would you like to see your local government make in your community for pedestrians? **(DO NOT READ LIST) (Multiple Record)**

- 1 More crosswalks
- 2 More sidewalks
- 3 More lights on streets
- 4 More lights on paths/trails
- 5 Other (Specify)
- 6 None, can't think of any
- 8 (VOL) Don't Know
- 9 (VOL) Refused

For the next couple of questions, please tell me what in your opinion is correct. First,

83. Are bicyclists supposed to stop at traffic lights and stop signs, like motor vehicles, or are they supposed to use their own judgment on whether they need to stop at red lights and stop signs?

- 1 Must stop, like motor vehicles
- 2 Can use own judgment
- 8 (VOL) Don't Know
- 9 (VOL) Refused

84. What do flashing red lights on a school bus mean for an approaching car? Do they mean . . .

- 1 Stop until lights stop flashing, or
- 2 Slow and then proceed with caution, or
- 3 Be prepared to stop, if necessary?
- 4 (VOL) Depends if there is a median in the road
- 8 (VOL) Don't Know
- 9 (VOL) Refused

85. Do drivers in your community usually yield to pedestrians in crosswalks?

- 1 Yes
- 2 No
- 8 (VOL) Don't Know
- 9 (VOL) Refused

86. Now I'm going to read you a few statements. Please tell me whether you agree, disagree, or neither agree nor disagree. **(read and rotate A-E)?**

- 1 Agree
- 2 Neither agree nor disagree
- 3 Disagree
- 8 (VOL) Don't Know
- 9 (VOL) Refused

**DO NOT ASK Q86a or Q86b if Q51=8**

- A. I would like to walk more than I am currently walking
- B. I would like to bicycle more than I am currently bicycling
- C. Bicyclists are just as entitled to ride on the road as are motorists
- D. Manuals used to study for a driver's license should include information about how to avoid accidents with pedestrians and bicyclists
- E. A driver who doesn't yield to pedestrians walking legally at a crosswalk should be ticketed

87. **(If 86-A is Agree)** What would you say is the most important reason why you do not walk as much as you would like? **(DO NOT READ LIST)**

- 1 Too busy
- 2 Poor health
- 3 No one to walk with
- 4 No sidewalks/sidewalks in poor condition
- 5 No shops or other interesting places to go
- 6 Fear street crime
- 7 Too many cars
- 8 Fast traffic
- 9 Have things to carry
- 10 Weather isn't good for walking
- 11 Don't think about it
- 12 Safety - unspecified
- 13 Other (specify)
- 98 (VOL) Don't Know
- 99 (VOL) Refused

88. **(If 86-B is Agree)** What would you say is the most important reason why you do not bicycle as much as you would like? **(DO NOT READ LIST)**

- 1 Too busy
- 2 Poor health
- 3 No one to bike with
- 4 No sidewalks/sidewalks in poor condition
- 5 No shops or other interesting places to go
- 6 Fear street crime
- 7 Too many cars
- 8 Fast traffic
- 9 Have things to carry
- 10 Weather isn't good for bicycling
- 11 Don't think about it
- 12 Safety - unspecified
- 13 Other (Specify)
- 98 (VOL) Don't Know
- 99 (VOL) Refused

89. Is it safe or dangerous to walk in your neighborhood or does it depend?

- 1 Safe **(Skip to #91)**
- 2 Dangerous **(Skip to #90)**
- 3 It depends
- 8 (VOL) Don't Know **(Skip to #91)**
- 9 (VOL) Refused **(Skip to #91)**

89a. What does it depend on?

**(OPEN-END)**

90. Why do you feel it's dangerous to walk in your neighborhood?

**(OPEN-END)**

(Specify)\_\_\_\_\_.

91. Is it safe or dangerous to ride a bicycle in your neighborhood or does it depend?

- 1 Safe **(Skip to #93)**
- 2 Dangerous **(Skip to #92)**
- 3 It depends
- 8 (VOL) Don't Know **(Skip to #93)**
- 9 (VOL) Refused **(Skip to #93)**

91a. What does it depend on?

**(OPEN-END)**

92 Why do you feel it is dangerous to ride a bicycle in your neighborhood? **(OPEN-END)**

(Specify)\_\_\_\_\_.

- 98 (VOL) Don't Know
- 99 (VOL) Refused

**CHILDREN WALKING/BIKING**

93. How many children, less than 16 years of age, currently reside in your household? Please do not count students living away from home or boarders. **(DO NOT READ LIST)**

- 0 None (Skip to #98)
- 1 One
- 2 Two
- 3 Three
- 4 Four
- 5 Five
- 6 Six
- 7 Seven or more
- 8 (VOL) Don't Know (Skip to #98)
- 9 (VOL) Refused (Skip to #98)

94. In your opinion, what is the youngest age that a child is able to cross a neighborhood street alone? A neighborhood street is defined as having low traffic volume and low traffic speeds.

\_\_\_\_\_ Age

- 98 (VOL) Don't Know
- 99 (VOL) Refused

95 How old is [the/the oldest] child residing in your household?

\_\_\_\_\_ Age

- 98 (VOL) Don't Know
- 99 (VOL) Refused

**If #95 < 5, Skip to #98**

96. How many days does this child ride a bicycle during a typical week in the Summer? **(If necessary, read:)** Summer months are May through September.

- \_\_\_\_\_ (0-7)
- 98 (VOL) Don't Know
- 99 (VOL) Refused

**If #96 = 0, Skip to #98**

97 When riding a bicycle, does this child wear a helmet for . . .

[READ LIST]

- 1 All rides
- 2 Nearly all rides
- 3 Most rides
- 4 Some rides
- 5 Not very many rides, or
- 6 Never
- 8 (VOL) Don't Know
- 9 (VOL) Refused

**(READ:)** Now, I have a few questions about the area where you live.

98. Do you currently live in a . . . ? [READ LIST]

- 1 House
- 2 Townhouse or row house
- 3 Apartment, condo, or co-op
- 4 Mobile home, OR
- 5 Other (Specify)
- 8 (VOL) Don't know
- 9 (VOL) Refused

99. These next questions ask about the area that is within a quarter mile around where you live. [**(If necessary, read:)** Or the length of about four football or soccer fields.] Are there **(read A-I, as appropriate)** within  $\frac{1}{4}$  mile of where you live? [ROTATE A-I]

1 Yes

2 No

8 (VOL) Don't know

9 (VOL) Refused

A. Single-family houses

B. Townhouses, apartments or condos

C. Mobile homes

D. Parks or recreational areas

E. Farms or ranches

F. Commercial businesses such as stores or restaurants

G. Public buildings such as schools, hospitals or government offices

H. Industrial buildings or factories

I. Heavy street traffic

**DEMOGRAPHICS BEGIN HERE:**

**(READ:)** Now, I have just a few last questions for classification purposes only.

AGE:

100. What is your age? **(Open ended and code actual age)**

99 99+

998 (VOL) Don't know

999 (VOL) Refused

**(If DK or RF in #100 Continue;  
Otherwise, Skip to #102)**

AGE:

101. Please stop me when I reach the category that includes your age?  
**(Read 01-08)**

1 16 or 17

2 18 to 24

3 25 to 34

4 35 to 44

5 45 to 54

6 55 to 64

7 65 to 74, or

8 75 or older

98 (VOL) Don't know

99 (VOL) Refused

EMPLOYMENT STATUS:

102. Are you currently employed full-time, part-time, unemployed and looking for work, retired, going to school, a homemaker, or do you do something else? **[MULTIPLE RECORD]**

1 Employed full-time

2 Employed part-time

3 Unemployed and looking for work

4 Retired

5 Going to school

6 Homemaker

7 (VOL) Disabled

8 Something else (Specify)

98 (VOL) Don't know

99 (VOL) Refused

EDUCATION:

103. What is the highest grade or year of school you have completed?  
**(DO NOT READ LIST)**

- 1 No formal education
- 2 First through 7th grade
- 3 8th grade
- 4 Some high school
- 5 High school graduate or GED
- 6 Some college
- 10 2-year technical/Associates degree
- 7 Four-year college graduate
- 8 Some graduate school
- 9 Graduate degree
- 98 (VOL) Don't know
- 99 (VOL) Refused

ETHNICITY:

104. Are you of Hispanic or Latino origin or descent?

- 1 Yes
- 2 No
- 8 (VOL) Don't know
- 9 (VOL) Refused

RACE:

105. Which of the following racial categories describes you? You may select more than one. **READ LIST AND MULTIPLE RECORD.**

- 1 American Indian or Alaska Native
- 2 Asian
- 3 Black or African American
- 4 Native Hawaiian or Other Pacific Islander
- 5 White
- 6 (VOL) Hispanic/Latino
- 7 (VOL) Other (SPECIFY)
- 8 (VOL) Don't know
- 9 (VOL) Refused

**(If code 6 ONLY in #105, Continue;  
Otherwise, Skip to #107)**

106. Do you consider yourself to be white-Hispanic or black-Hispanic?

- 1 White-Hispanic
- 2 Black-Hispanic
- 3 (VOL) Hispanic/Respondent refused to discriminate
- 4 Other (Specify)
- 8 (VOL) Don't know
- 9 (VOL) Refused

INCOME:

107. Which of the following categories best describes your total household income before taxes in 2011? Your best estimate is fine. Would it be (read 1-7)?

- 1 Less than \$5,000
- 2 \$5,000 to less than \$15,000
- 3 \$15,000 to less than \$30,000
- 4 \$30,000 to less than \$50,000
- 5 \$50,000 to less than \$75,000
- 6 \$75,000 to less than \$100,000, OR
- 7 \$100,000 or more
- 8 (VOL) Don't know
- 9 (VOL) Refused

109 How often do you drive a motor vehicle? Almost every day, a few days a week, a few days a month, a few days a year, or do you never drive?

- 1 Almost every day/every day
- 2 Few days a week
- 3 Few days a month
- 4 Few days a year
- 5 Never
- 6 More than a year ago since drove
- 7 Other (Specify)
- 8 (VOL) Don't know
- 9 (VOL) Refused

110. How many licensed motor vehicles are owned, leased, or available for regular use by members of your household? **(DO NOT READ LIST)**

- 0 None
- 1 One
- 2 Two
- 3 Three
- 4 Four
- 5 Five
- 6 6 or more
- 7 (VOL) Zip car, etc
- 8 (VOL) Don't know
- 9 (VOL) Refused

111. Do you currently have any disability, health impairment or condition that limits the amount of walking you can do?

- 1 Yes
- 2 (VOL) Yes, I use a wheelchair **(Skip to Q113)**
- 3 (VOL) Yes, I use a motorized chair **(Skip to Q113)**
- 4 No **(Skip to Q113)**
- 8 (VOL) Don't know **(Skip to Q113)**
- 9 (VOL) Refused **(Skip to Q113)**

112. Do you use special equipment to help you walk, or do you use a wheelchair, or do you use a motorized chair?

- 1 Yes, special equipment
- 2 Yes, a wheelchair
- 3 Yes, a motorized chair
- 4 No
- 8 (VOL) Don't know
- 9 (VOL) Refused

113. In general, how easy or difficult is it for you to travel to the places in your COMMUNITY where you want to go? Do not include out of town travel. Would you say it is **(Read 1-4)**:

- 1 Very easy; **(Skip To Q116)**
- 2 Somewhat easy; **(Skip To Q116)**
- 3 Somewhat difficult; or
- 4 Very Difficult.
- 5 (VOL) It depends on where I am traveling from
- 8 (VOL) Don't know **(Skip To Q116)**
- 9 (VOL) Refused **(Skip To Q116)**

114. Where in your community do you find it more difficult to travel from?

**(DO NOT READ LIST) (Multiple Record)**

**RI NOTE: Probe for a specific place such as home or work, not a general area such as a neighborhood name.**

- 1 Home
- 2 Work
- 3 Doctor's Office
- 4 Place doesn't matter/All the same
- 5 Other (Specify)
- 8 (VOL) Don't know
- 9 (VOL) Refused

115. What are the reasons it is difficult for you to travel to the places in your community where you want to go? **(DO NOT READ LIST) (Multiple Record)**

- 1 Don't have access to vehicle
- 2 Vehicles can't accommodate mobility equipment
- 3 Sidewalks are inadequate/poor condition
- 4 Other (Specify)
- 8 (VOL) Don't know
- 9 (VOL) Refused

116. May I please have your ZIP code?

ENTER 5 DIGIT ZIP CODE:

99998 (VOL) Don't Know

99999 (VOL) Refused

**ASK ONLY FOR LANDLINE SAMPLE, OR IF SC3=2, ELSE SKIP TO Q119**

118. And, NOT including cell phones or lines dedicated to a fax machine, modem or used strictly for business purposes, how many different phone NUMBERS do you have coming into your household? **(DO NOT READ LIST)**

- 1 One
- 2 Two
- 3 Three
- 4 Four
- 5 Five or more
- 6 (VOL) No landline phone in home for non-business purposes
- 8 (VOL) Don't know
- 9 (VOL) Refused

119. During the past 12 months, has your household been without telephone service for 1 week or more? Do not include interruptions of telephone service because of weather or natural disasters.

- 1 Yes
- 2 No
- 8 (VOL) Don't know
- 9 (VOL) Refused

**ASK ONLY FOR LANDLINE SAMPLE**

120. Do you have a cell phone in addition to the line we are speaking on right now?

- 1 This is only phone
- 2 Also has cell phone
- 8 (VOL) Don't Know
- 9 (VOL) Refused

**CELL SAMPLE ONLY:**

121. Including yourself, how many persons age 16 and older live in your household?

- [ENTER NUMBER 1-10]
- 97 NONE
- 98 (VOL) Don't know
- 99 (VOL) Refused

**ASK ONLY IF LANDLINE SAMPLE AND (Q120=2)**

122. Of all the telephone calls that you or your family receives, are .

- . . (Read List)
- 1 All or almost all calls received on cell phones
- 2 Some received on cell phones and some on regular phones
- 3 Very few or none on cell phones
- 8 (VOL) Don't know
- 9 (VOL) Refused

**ASK ONLY IF LANDLINE SAMPLE AND (Q120=2)**

123. Thinking about just your LAND LINE home phone, NOT your cell phone, if that

telephone rang when someone was home, under normal circumstances, how likely is it that the phone would be answered? Would you say it is ... (Read List)

- 1 Very likely the land line phone would be answered,
- 2 Somewhat likely,
- 3 Somewhat unlikely,
- 4 Very Unlikely, or
- 5 Not at all likely the land line phone would be answered
- 8 (VOL) Don't know
- 9 (VOL) Refused

124. Did you visit the National Highway Traffic Safety Administration website to find out more information about the survey? (at [www.nhtsa.dot.gov](http://www.nhtsa.dot.gov) )

- 1 Yes
- 2 No
- 8 (DK)
- 9 (Refused)

**FOR LANDLINE AND LANDLINE OVERSAMPLE ONLY**

Those are all the questions I have for you. Thank you for your participation.

**FOR CELL SAMPLE ONLY**

C1. May I please have your name, street address, city, and state and ZIP code so I can send you your \$10 incentive check?

ENTER NAME:  
ENTER ADDRESS:  
ENTER CITY:  
ENTER STATE:  
ENTER ZIP:

Those are all the questions I have for you. Thank you for your participation.

SCR1. I am sorry but you are not eligible to participate in the survey today. Thank you for your cooperation and I hope you have a pleasant evening.

RI NOTE: IF NEEDED FOR 5432c: I am sorry but you are not eligible to receive the \$10 incentive.

**(THANK RESPONDENT)**

DOT HS 811 841 C  
October 2013



U.S. Department of Transportation  
**National Highway Traffic Safety  
Administration**



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