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Supporting Statement

B. Collections of Information Employing Statistical Methods

The proposed information collection will employ statistical methods to analyze the data collected from respondents. The following sections describe the procedures for respondent sampling and data tabulation.

B.1.   Describe the potential respondent universe and any sampling or other respondent selection to be used.

a.   Respondent Universe

Information collection will occur at five sites in which a law enforcement agency has agreed to provide NHTSA over the course of a one-year period with detailed information concerning their enforcement activity, with particular emphasis on enforcement of the laws prohibiting alcohol-impaired driving. The five sites are Fresno and San Luis Obispo in California; and Rockford, Decatur, and Peoria in Illinois. The sites will span different models of Highly Visible Enforcement (HVE).

Telephone surveys will be conducted at each site to gauge community-level awareness of the HVE activity and community perceptions of the likelihood of an alcohol-impaired driver being stopped by law enforcement officers. The respondent universe will be residents of each selected community who are drivers, age 21 and older, have access to a residential landline telephone and/or a personal cell phone, and have consumed alcohol in the past year. Respondents who are reached, but do not meet the eligibility criteria will be asked to provide basic demographic information for weighting purposes. Because the response rates of younger adults is typically much lower than that of older adults, a random sample of the adult population would yield samples of young adults well below their population prevalence. Therefore, this project will over-sample young adults ages 21 through 34.

The perceptions of drivers who are more at risk of driving with Blood Alcohol Concentrations (BACs) beyond the legal limit are a particular focus in this study. Thus, the telephone surveys will contain questions intended to differentiate those high risk drivers from other drivers. These will include CAGE questions that have been validated as predictors of drinking problems, and questions pertaining to usual drinking quantity that likewise have shown a relationship to problem behavior.

b.   Respondent Sampling

The telephone surveys will use a dual frame design in which both a landline sample and cell phone sample are drawn and subsequently combined. The total sample size will be 1,200 respondents per site. This will be composed of a cross-sectional sample of 1,000 and an over-sample of 200 respondents ages 21 through 34. Average interview time will be 10 minutes. Due to the ever increasing proportion of the population that relies on cell phones, 50 percent of the interviews will be conducted with individuals on cell phones For both the cross-sectional sample and the oversample of drivers aged 21-34. Both the landline and cell samples will be obtained from Survey Sampling International (SSI).

The landline sample will be drawn from telephone banks randomly selected from an enumeration of the Working Residential Hundred Blocks within the active telephone exchanges within the Region.   The Working Hundreds Blocks are defined as each block of 100 potential telephone numbers within an exchange that includes one or more residential listings (i.e., this will be a list-assisted sample). A two-digit number will then be randomly generated for each selected Working Residential Hundred Block to complete the phone number to be called. By randomly generating these numbers, a process known as random digit dialing (RDD), every number in the sampling frame of Hundreds Blocks has an equal probability of selection regardless of whether it is listed or unlisted.

The cell phone sample will be selected from 1,000 banks in the U.S. dedicated to wireless service. Geographic information for the telephone exchanges will be used to identify those associated with the targeted geographic areas. RDD will be used to select the cell phone numbers that will be in the sample, and interviewers will manually dial the numbers to reach a respondent. Once a respondent is reached, the interviewer will confirm that they live in the target area, since cell phone numbers are very often ported to other areas of the country.

The RDD sample of telephone numbers is dialed to determine which are currently working residential household telephone numbers. Non-working numbers and non-residential numbers are immediately replaced by other RDD numbers selected within the same stratum (landline or cell) in the same fashion as the initial number. Ineligible households are also replaced. Non-answering numbers are not replaced until the research protocol is exceeded. The systematic dialing of those numbers to obtain a residential contact should yield a probability sample of landline telephone numbers.

The next step is selecting the household member to interview. Once a household is contacted, the interviewer will introduce him/herself and the survey, and ask a series of screening questions to determine if there is anyone residing in the household who meets the eligibility criteria for survey participation. If there is one person in the household meeting the eligibility criteria, the interviewer will seek to interview that person. If there are multiple people residing in the household that meet the criteria, the interviewer will randomly select one of those household members by asking to speak with the age-eligible household member who had the most recent birthday. Only that randomly selected person will be eligible to participate in the survey; no substitution by other household members will occur. If the selected respondent is not available, then the interviewer will arrange a callback. In cases where no one residing within the household is in the eligible age range, the interviewer will thank the individual who answered the phone, terminate the call, and the number will be removed from the sample.

Although list-assisted landline RDD sampling provides only a small coverage error for landline telephone households within landline banks, the restriction of the sampling frame to only landline banks would introduce a much more serious coverage error in general population surveys. The increasing percentage of households that have abandoned their landline telephones for cell phones has significantly eroded the population coverage provided by landline-based surveys. The key group that is missing from landline RDD samples is the cell phone-only group. But there is also potential bias in landline samples from under-coverage of people living in households with landlines but who have a low likelihood of being reached on them because they rely on wireless

telephones for all or almost all of their calls. The cell phone sample for this survey will therefore be composed of respondents reached on their cell phone who are eligible for the study.

c. Response Rate

Response rates for telephone surveys have generally been declining, with cell phone rates being particularly low. Recent national surveys conducted by NHTSA have obtained landline response rates between approximately 25% and 35%, and cell phone rates between approximately 15% and 20%. The interviews for those surveys were about twice the length as the proposed interviews will be for this project, which suggests that the proposed surveys may attain response rates at least comparable to the higher end of those ranges, 20% for cell phone and 35% for landline. However, these are community-level surveys. How community-specific factors will affect the response rates is unknown.

B.2. Describe the procedures for the collection of information.

a. Procedures for Collection of Information

Telephone Surveys

For the landline interviews, a sample of assigned telephone banks will be randomly selected from an enumeration of the Working Residential Hundreds Blocks of the active telephone exchanges within the defined geographic area for each community participating in this study. A two-digit number is then randomly generated by computer for each Working Residential Hundreds Block selected, a technique known as random digit dialing (RDD). The next stage involves calling the number and selecting an eligible household member to participate in the survey. The interviewers will ask several screening questions to determine if there are any drivers within the contacted household who are in the required age range and occasionally drink alcohol. If only one household member is found eligible, then the interviewer will ask to proceed with the interview with that person. If more than one household member is eligible, then the interviewer will ask to speak to the eligible household member who will have the next birthday. If an interview can't be conducted with the selected household member at the time of the call, then the interviewer will ask for a convenient time when a callback can be scheduled. If the selected household member refuses to participate in the interview, but it is a soft refusal, then the interviewer will place the sampled household number in a queue for refusal conversion efforts to be conducted one-to-two weeks after the refusal. However, if it was a hard refusal, then no refusal conversion effort will be conducted. If there is not a person who is eligible for the study in the household, we will still ask basic demographic questions before screening them out. This will enable us to weight the data appropriately since there are no Census estimates which readily correspond to our screening criteria.

The cell phone sample will be selected from 1,000-banks in the U.S. dedicated to wireless service. All calls placed to cell phone numbers will be hand-dialed. This study will treat the cell phone as a single user device, so no within-household selection methods akin to

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those used for the landline sample will be needed. The interviewers will first confirm the respondent is on a cell phone and make sure that the respondent is not in some situation that could put him or her at risk if the interview proceeded. If a respondent is driving or is in some other situation where they could be in danger if they were interviewed at that time, then the interview will be terminated and attempted at another time. If a prospective respondent refuses to participate or prefers to participate at a later time, then the Contractor will apply the same refusal conversion and callback procedures used for the landline sample.

The methods for interviewing the over-sample will be the same as those for the landline and cell phone cross-sectional samples. The sole difference is that the age screening will be for 21 through 34 rather than 21 and older. The over-sample will be composed of interviews of people on both landline phones and cell phones.

Data collection will be conducted by trained interviewers working in telephone research centers that utilize a computer-assisted telephone interviewing (CATI) network. Initial telephone contact will be attempted during the hours of the day and days of the week that have the greatest probability of respondent contact. If the interview cannot be conducted at the time of initial contact, the interviewer will reschedule the interview at a time convenient to the respondent. Although interviews will be conducted on evenings and weekends whenever possible, daytime interviews will be scheduled whenever necessary.

b   *Power to Detect Differences*

Telephone Surveys

Core analyses for this project will compare telephone survey responses across sites. The five program sites will span different HVE models, with some of the models entailing HVE at very high levels. For the impact on public perceptions to be considered significant in light of the level of effort and resources expended conducting HVE, detected differences must be more than just a few percentage points.

If simple random sampling was being used to conduct the survey, the confidence interval for sample estimates of population proportions would be calculated by the following formula:

$$z*\left[se(x)=\sqrt{\frac{(p*q)}{(n-1)}}\right]$$

Where:
se (x) =   the standard error of the sample estimate for a proportion
p   =   some proportion of the sample displaying a certain characteristic or attribute
q   =   (1 - p)
n   =   the size of the sample
z   =   the standardized normal variable, given a specified confidence level (1.96 for 95% confidence interval)

Testing whether or not a difference between two sample proportions is statistically significant would involve a rather simple calculation. The maximum expected sampling error of the first sample is designated **s1** and the maximum expected sampling error of the

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second sample is **s2**. The sampling error of the difference between these estimates is **sd** and is calculated as:

$$sd = \sqrt{(s1^2 + s2^2)}$$

For comparison of two samples of 1,200 each using the above formula and assuming simple random samples, a difference would have to exceed 4.0 percentage points to be statistically significant (with the conservative estimate of p=q). However, the proposed methods for this study involve a complex sampling design using a dual frame and over-sampling of younger persons. This means that tests of statistical significance will need to take into account design effects. It's uncertain what the design effect will be for prospective community surveys. But data on selected items from a 2008 dual frame national alcohol telephone survey indicated confidence intervals that were, on average, about 1.5 times greater than what the confidence intervals would be for a simple random design[1]. Applying a multiplier of 1.5 to the 4.0 percentage point difference required for statistical significance under a simple random design results in a 6 percentage point threshold, which is adequate for purposes of this project.

c   Sample Weighting

Each respondent to the survey both in the landline sample and the cell phone sample will be assigned a base sampling weight. The base weight is the reciprocal of the probability of selection of the respondent. For those selected in the RDD sample, the weight is the ratio of the number of telephone numbers in the 1+ working banks (groups of 100 consecutive numbers that contain at-least one directory-listed residential number) to the number of telephone numbers selected from those banks and actually released for use. The telephone exchanges from which the 100-banks will be sampled will be those assigned to targeted geographic areas. The base weight for respondents selected in the cell phone sample will be the ratio of the total numbers available for sampling to those selected and released for use.

Since a respondent in the oversample group also has a nonzero probability of being selected in the landline or cell phone cross-sectional stratum, the total number of telephone numbers across these strata will be used to determine the base weight.

Adjustments to the base weight will depend on whether the respondent is selected from a landline sample or cell sample. First, adjustments of weights for those selected in the landline sample are given.

Landline Sample

Respondents selected from households with two or more residential numbers have a higher probability of being selected into the RDD sample. To preserve the relationship between the base weight and this probability, the base weight of respondents from those households will be divided by the number of nonbusiness voice-use telephone numbers. The maximum number of telephone numbers used for dividing the base weight will be limited to 3. This limits the increase in variance associated with differential weighting.

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[1] See the 2008 National Survey of Drinking and Driving Attitudes and Behavior, Volume 3 Methodology Report, DOT HS 811 344. August 2010, Page 17.

Other Adjustments to the Base Weight

When a landline number is called, it could be a residential number, non-residential number, or it is unknown whether the telephone number is residential. The number of residential numbers among those numbers in the unknown category will be estimated and this will be used to adjust the base weight. The base weight will be multiplied by the ratio of the total number of households both known and estimated to the total number of known household numbers to adjust the base weight for known households.

Adjustment for Unit Nonresponse

Screening Nonresponse

Households are screened to determine if there are any drivers in the households who are in the required age range and occasionally drink alcohol. As a result of screening, households are classified as eligible for the survey, not eligible for the survey, and eligibility unknown. The number of eligible households among the eligibility unknown will be estimated by taking the ratio of eligible households among those with known eligibility and multiplying this by the number of households with unknown eligibility. The ratio of the number of known and estimated number of eligible households to the known number of eligible households will be used to multiply the base weight determined in the previous step. This is the adjusted base weight that will be assigned to all the eligible households.

Household Nonresponse at the Interview Stage

The sampling plan involved selecting an eligible person from each eligible household. There may be nonresponse to this attempt of selecting a person from the household. To account for such households the ratio of responding and non-responding households to responding households will be used to adjust the weight obtained the previous step.

Person Weight

Since one person is selected within an eligible household, the selected person in the household will be assigned a person weight. This weight is the number of eligible persons in the household.

The overall person weight is the product of adjusted base weight and the person weight.

Nonresponse Adjustment to Person Weight

If the selected person in a household does not respond then the weights of responding persons in other households will be adjusted to account for this nonresponse. This will be done by first computing the ratio of the weighted number of persons who respond and weighted number of persons who do not respond to the weighted number of persons who respond. Each responding person's weight will be multiplied by this ratio and this is the nonresponse-adjusted person weight.

Cell Sample

The base weight for respondents selected in the cell sample will be adjusted for those whose eligibility for the survey is unknown. This adjustment will be based on those who responded to the screening question.

Adjustment of the base weight to nonresponse to the survey will be done in the same way as for persons selected in the landline sample.

Adjustment of weights for overlap of persons in the household sample and the cell sample.

The overlap is defined as those who identify themselves as cell-mostly in the landline sample and as cell-mostly in the cell sample. The cell-mostly sample both in the landline sample and the cell sample provide estimates of the same cell-mostly population. To adjust for this overlap, the nonresponse-adjusted weights of these cell-mostly persons in the landline sample will be multiplied by a factor λ (between 0 and 1) and the weights of persons in the cell-mostly in the cell sample will be multiplied by ($1-\lambda$). The value of λ will be determined based on the variance of the estimate of some main characteristic of interest for the cell-mostly group in the two samples.

Poststratification Adjustment of Weights

Poststratification adjustment of nonresponse-adjusted weights can be done through a process known as raking. This is possible only if we collect data, on age, gender, race/ethnicity, telephone status for all persons screened either eligible or not eligible for the survey. We must also determine sampling weights for those not eligible for the survey. The weights of the entire sample will be raked such that sum of the weights agree with the population control totals for different categories of variables mentioned above. The final weights will be used for getting all estimates from the survey.

The weights will be reviewed to determine if any trimming of weights is advisable due to large weights. Any weight exceeding median weight + 6 times the inter quartile range (IQR) will be trimmed or truncated to the median + 6 times IQR. If there are no large weights using this definition, then there will be no trimming of weights.

B.3.   Describe methods to maximize response rates.

The telephone interviewing will be conducted only by thoroughly trained and experienced interviewers who are highly motivated and carefully monitored. The CATI network they use will have capability for silently monitoring the performance of the interviewers. Monitoring will be conducted by supervisory staff 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 the study specifications;

4. Whether or not open-ended questions are properly probed;

5. Whether or not the interviewer enters the correct code, number, or verbatim response to the question;

6. Whether or not ambiguous or confused responses are clarified

7. How well questions from the respondent are handled without alienating the respondent or biasing his/her response;

8. Avoiding bias by either comments or vocal inflection;

9. Ability to persuade wavering, disinterested or hostile respondents to continue the interview; and

10. General professional conduct throughout the interview.

All telephone interviewers will have had training on how to overcome initial reluctance, disinterest or hostility during the contact phase of the interview. There will be regular review of field outcome data so that patterns and problems in both response rate and production rates can be detected and analyzed. Periodic meetings will be held with the interviewing and field supervisory staff and the study management staff to discuss problems with contact and interviewing procedures and to share methods of successful persuasion and conversion.

B.4.   Describe any tests of procedures or methods to be undertaken.

For the telephone surveys, there will be automated testing of the CATI programming to assure that it operates as planned. The telephone interviewers will receive project-specific training that will include mock interviews to enhance their familiarity with the survey instrument and provide them with practice in administering project-specific protocols.

B.5.   Provide the name and telephone number of individuals consulted on statistical aspects of the design

The following individuals consulted on statistical aspects of the study design:

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