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SUPPORTING STATEMENT

A. Justification

A.1. Explain the circumstances that make the collection of information necessary. Identify any legal or administrative requirements that necessitate the collection. Attach a copy of the appropriate section of each statute and regulation mandating or authorizing the collection of information.

A.1.1. Circumstances making the collection necessary.

1. Speeding related crash, fatality and injury problem

Speeding is one of the most prevalent factors contributing to traffic crashes. In 2006, speeding was a contributing factor in 31 percent of all fatal crashes causing the death of 13,543 persons. Motor vehicle crashes cost society an estimated \$7,300 per second. The total economic cost of crashes was estimated at \$230.6 billion in 2000. In 2000, the cost of speeding-related crashes was estimated to be \$40.4 billion — \$76,865 per minute or \$1,281 per second.¹ Over the past ten years, over 13,000 people have been killed annually in speeding related crashes, representing consistently about 30 percent of all fatal crashes in the United States. This persistent and serious problem requires new and innovative countermeasures.

With the changing environment, NHTSA requires up-to-date information to ascertain where efforts must be upgraded, where new emphases are needed, where new tactics must be devised, where alternative targets are advisable, and where current resources need to be redirected.

This collection supports the Department of Transportation's strategic goal in safety and the National Highway Traffic Safety Administration's (NHTSA) mission to save lives, prevent injuries and reduce economic costs due to road traffic crashes, through education, research, safety standards and enforcement activity. The information collection described herein will be used to develop strategies and initiatives to meet that goal and mission.

The information collection is required because, across program areas, there is a persistent need to measure the level of public support for legislative and enforcement initiatives due to the strong reliance of the safety community on these types of interventions.

2. The need to assess the effectiveness of a new speed management program

NHTSA intends to introduce a speed management program within the City of Tucson that uses both conventional and automated speed enforcement methods. Tucson was selected because it has a speed related crash problem and has an authorized, but immature, automated speed enforcement program currently in place. NHTSA will utilize a control site (location to be determined), where the survey will also be administrated

¹ NCSA, 2007

both before and after the countermeasure treatment is introduced.

The telephone survey is one part of a comprehensive demonstration project that will evaluate other data and performance measures to determine the overall effectiveness of the project. Those measures include travel speeds, average daily traffic counts, crash incidence, speed and other traffic violations, and a public communications program that will include print, radio and television media.

NHTSA needs to determine the effectiveness of this program to make adjustments to its future speed management initiatives. The effectiveness of this program will be determined, in part, by examining the public's awareness and support before and after the program's implementation using the collection instrument for which approval is being sought.

3. Hypothesis

The telephone survey will test the following hypothesis:
Will the Public Information and Education campaign affect the general public's acceptance of Automated Speed Enforcement, when deployed as a concomitant countermeasure to traditional speed enforcement, to the extent that there will be a significant difference in the number of people who approve of automated speed enforcement after the demonstration project than did before the demonstration project? We hypothesize that the answer will be "Yes." We expect the automated and traditional speed enforcement and the Public Information and Education campaign will cause the general public's approval of automated speed enforcement to significantly increase. To test this hypothesis we have designed a test group and a control group.

There will be two phone survey time periods. One phone survey will be completed before the speed demonstration and Public Information and Education program begins; one phone survey will be completed after the speed demonstration and Public Information and Education program ends. The test group will consist of two independent probability samples of residents from Tucson, Arizona. One of these test groups will comprise the pre-demonstration sample while the other will be the post-demonstration sample. Similarly, the control group will consist of two independent probability samples of residents from the Southwestern Phoenix, Arizona area. As with the test group, one of these control groups will comprise the pre-demonstration sample while the other will be the post-demonstration sample. We will calculate the difference between respondent attitudes toward automated speed enforcement within the test group and the control group between time one (before demonstration and Public Information and Education campaign) and time two (after demonstration and Public Information and Education campaign). We then will analyze if there is a significant difference regarding respondent attitudes toward Automated Speed Enforcement between the groups. We will analyze whether there is a significant difference between the test group time one and time two difference, and the control group time one and time two difference." This methodology will be discussed in more detail under Section B.

A.1.2. Statute authorizing the collection of information

The National Traffic and Motor Vehicle Safety Act of 1966, Title 15 United States Code 1395, Section 106 (b), gives the Secretary authorization to conduct research, testing, development, and training as authorized to be carried out by subsections of this title. The Vehicle Safety Act was subsequently recodified under Title 49 of the U.S. Code in Chapter 301, Motor Vehicle Safety. Section 30168 of Title 49, Chapter 301, gives the Secretary authorization to conduct research, testing, development, and training to carry out this chapter. (See Attachment A for full text)

A.2. Indicate how, by whom, and for what purpose the information is to be used. Except for a new collection, indicate the actual use the agency has made of the information received from the current collection.

A.2.1 NHTSA Data Applications

NHTSA will use the data to develop, and implement effective countermeasures for speeding. The survey data, in conjunction with data from the entire speed demonstration project, will be used specifically to assist NHTSA in evaluating the effectiveness of combined automated and traditional speed enforcement programs to deter speeding related crashes. Both NHTSA program and regional operations staff will use the findings to guide their development and implementation activities respectively. For example, if support for automated speed enforcement were limited to high pedestrian locations, NHTSA will work with communities to meet their requirements.

A.2.2 State and local Data applications

State and local highway safety authorities will use the findings to develop, and implement their own speeding countermeasure programs. Various traffic safety advocacy organizations concerned with traffic safety issues may use the findings for their own speeding countermeasure initiatives.

The desired outcome of the speed management demonstration project is to provide adequate information and examples for the utilization of combined traditional and automated speed enforcement programs to improve the safety of roadways nationwide.

A.3. Describe whether, and to what extent, the collection of information involves the use of automated, electronic, mechanical, or other technological collection techniques or other forms of information technology. Also describe any consideration of using information technology to reduce burden.

Data collection will be accomplished through the use of Computer Assisted Telephone Interviewing (CATI). The CATI system provides correct question sequence, automatically executes skip patterns based on prior answers, recalls answers to prior questions, displays the information in the text of later questions, provides random rotation of specified questions or response categories, ensures that questions can not be skipped

and, rejects invalid responses or data entries.

The CATI system eliminates the need for interviewers to track skip patterns and flip pages. Moreover, the interviewers enter responses directly from their keyboards, and the information is automatically recorded in the computer's memory. CATI allows the computer to perform a number of critical assurance routines that are monitored by survey supervisors, including tracking average interview length, refusal rate, termination rate by interviewer, and performing consistency checks for inappropriate combinations of answers. The CATI system provides efficiencies in the survey interview process that reduce the burden in survey administration.

A.4. Describe efforts to identify duplication. Show specifically why any similar information already available cannot be used or modified for use for the purposes described in Item 2 above.

The questions asked in this survey are being used to evaluate the specific program being implemented in Tucson, AZ. This program is the first to examine both automated and traditional speeding enforcement components simultaneously and therefore, the questions do not duplicate any other information collection.

A.5. If the collection of information impacts small businesses or other small entities, describe methods used to minimize burden.

The collection of information involves randomly selected individuals in their households. Small businesses are not involved in this collection.

A.6. Describe the consequence to Federal program or policy activities if the collection is not conducted or is conducted less frequently, as well as any technical or legal obstacles to reducing burden.

The information is necessary for NHTSA to be able to develop and implement speed management programs. Speeding related crashes have held steady at approximately 30 percent of fatal crashes for the past 10 years. In spite of the wide range of countermeasures that have been introduced, this information collection supports the evaluation of a new countermeasure that may have an impact on these crashes. The combination of traditional and automated enforcement countermeasures, executed in one program, has never been demonstrated or evaluated.

The burden to respondents is kept to a minimum. Each respondent participates in only one survey and each household is limited to one respondent. There are no technical or legal obstacles to reducing the burden.

A.7. Explain any special circumstances that would cause the information collection to be conducted in a manner inconsistent with the guidelines set forth in 5 CFR 1320.6.

No special circumstances require the collection to be conducted in a manner inconsistent with the guidelines in 5 CFR 1320.6.

A.8. Provide a copy and identify the date and page number of publication in the Federal Register of the agency's notice, required by 5 CFR 1320.8 (d), soliciting comments on the information collection prior to submission to OMB. Summarize public comments received in response to that notice and describe actions taken by the agency in response to these comments. Describe efforts to consult with persons outside the agency to obtain their views.

A8.1. Federal Register Notice

Federal Register, Volume 73, Number 23, pages 6556- 6558, February 4, 2008. The closing date for comments was April 4, 2008. No comments were received

A.9. Explain any decision to provide any payment or gift to respondents, other than remuneration of contractors or grantees.

No payment or gift will be provided to any respondent.

A.10. Describe any assurance of confidentiality provided to respondents.

The contractor will collect all of the data. Respondents will be told at the onset of the interview that "This survey is completely anonymous. Responses will never be linked to individual respondents." This notice will be repeated to the respondent prior to asking respondents for any demographic information. All interviewers will sign statements of confidentiality in which they promise not to reveal the results of any interview.

An additional safeguard is the fact that the name of the respondent is not collected during the course of the interview, and the telephone number is separated from the survey data before analysis. All questionnaires, other records, and database entries will be identified by case identification numbers only. These procedures ensure that data on individual respondents cannot be traced to the sources.

A.11. Provide additional justification for any questions of a sensitive nature, such as sexual behavior and attitudes, religious beliefs, and other matters that are commonly considered private.

The survey does not contain any questions related to matters that are commonly considered sensitive or private.

A.12. Provide estimates of the hour burden of the collection of information on the respondents.

Since respondents will be contacted at home, the survey will not be an actual cost to the respondents (i.e., they will be participating during non-salaried hours). However, the time they spend on the survey can still be looked at in terms of what it would have cost if the respondents had spent that amount of time on a task while on the job. Based on median per capita income (Table P-1 from CPS Population and Per Capita Money Income, All Races: 1967 to 2004.” Source: U.S. Census Bureau, Housing and Household Economic Statistics Division Last Revised: January 13, 2006), the total respondent cost for the survey period would be:

$$\text{\$11.92 per hour} \times \frac{1}{4} \text{ hour per interview} \times 1620 \text{ interviews} = \text{\$4,827.60}$$

The following table shows the sampling plan and the estimated number of interviews and the time estimate per interview.

Sample Size: n = 400 for each of two administrations for the demonstration and control sites for a total of N = 1600. A Pretest of 20 cases will increase N = 1620.

Interview length per sample: 15 minutes

Total hour burden 1620 interviews × 15minutes per interview = 405 hours

A.13. Provide an estimate of the total annual cost burden to respondents or record keepers resulting from the collection of information.

There are no record keeping or reporting costs to respondents. Each respondent only participates once in the data collection. Thus there is no preparation of data required or expected of respondents. Respondents do not incur any capital, start up, operational, maintenance, or purchase costs as a result of participating in the survey.

A.14. Provide estimates of annualized cost to the Federal government.

Total Contract cost to government: \\$999,994.38

Portion of contract cost allocated to survey: 13.5%

Total estimated cost to the government for conducting the survey is as follows:

Number of completed interviews (pretest and survey interviews)	1620
Total estimated cost of conducting survey	\$135,473.50
Cost per completed interview	\$83.63

This estimate is based on the total cost of the awarded survey contract divided by the specified number of completed pretest and survey interviews.

A.15. Explain the reasons for any program changes or adjustments reported in Items 13 or 14 of the OMB Form 83-1.

This item is not applicable. This is a new survey.

A.16. For collections of information whose results will be published, outline plans for tabulation, and publication.

NHTSA plans to publish results of the survey as part of the final report on this speed management project.

The final report will contain a detailed summary of findings, a description of the data analysis, a complete set of data presentations including tabulations and cross-tabulations and graphical outputs. The analysis section will include standard errors and confidence intervals, the results of tests of significance between key statistics and the methodology section will include a description of the method of data collection, the questionnaires in English and Spanish, the probability sampling plan including a description of the frame and sample sizes, weighting procedures, and actual weights, variance estimation procedures and participation rates. The anticipated date of the final report publication, with the survey findings is: 9/10/10.

A.17. If seeking approval to not display the expiration date for OMB approval of the information collection, explain the reasons that display would be inappropriate.

Since this is a CATI survey, approval is not sought to “not display” the expiration date.

A.18. Explain each exception to the certification statement identified in Item 19, Certification for Paperwork Reduction Act Submissions,” of OMB Form 83-1.

No exceptions to the certification statement are made.

B. Collections of Information Employing Statistical Methods

The proposed study will employ statistical methods to analyze the information collected from respondents. The following sections describe the procedures for respondent sampling and data tabulation. However, before describing these procedures, we reiterate the hypothesis in this study.

The hypothesis in this study focuses on the attitudes of respondents in the test site of Tucson, Arizona and a control site. The hypothesis is that the Public Information and Education campaign associated with the automated and traditional speed enforcement demonstration will affect the general public's attitudes and levels of acceptance of Automated Speed Enforcement. That is, when automated speed enforcement is deployed as a concomitant countermeasure to traditional speed enforcement, there will be a significant increase in the number of people who approve of automated speed enforcement. The phone survey will measure the attitudes of people both “before” and “after” the Tucson demonstration project and Public Information and Education Campaign.

In addition to measuring the attitudes of people both “before” and “after” the demonstration project and Public Information and Education Campaign, there will be a comparison of a test site and control site. We will compare the respondent attitudinal differences for the test site (percentage approving “after” the Tucson demonstration minus the percentage approving “before” the demonstration) to the control site (percentage approving “after” the Tucson demonstration minus percentage approving “before” the demonstration). For the test site we expect a large increase in approval of automated speed enforcement. For the control site we expect little or no percentage increase in approval.

When comparing the test site to the control site differences observed, we expect the phone survey results will show a significant increase in the percentage of people approving of Automated Speed Enforcement in the test site, but this increase will not be observed in the control site. We expect a comparison of test and control group differences to yield statistically significant results. Having summarized the hypothesis, we now describe the respondent universe.

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

The universe for this survey includes all licensed drivers (18 years and older) residing in the Tucson and control city area(s). This is the adult population that is age-eligible to drive motor vehicles and, given that the focus of this survey is on the reactions of all drivers in response to the countermeasures introduced in the program, it is important that the sampling frame encompass the full adult driving population.

Of the **662,055** Pima County, Arizona licensed drivers (as of 4/1/08), 800 Tucson telephone interviews and 800 telephone interviews in the control community (location(s))

to be determined) are planned. As specified in Section A.12., the contractor will administer the survey once before and once after the countermeasure program is introduced in both the demonstration and control sites. Each administration of the survey will be to 400 randomly selected respondents. Identical methods will be used to draw the sample for both administrations.

For each administration of the survey, 400 respondents will be drawn from a probability sample of households in the Tucson and control site areas selected through a random digit dialing (RDD) sampling process.

The expected response rate target for this survey will be at least **50%** based on the subject matter is not sensitive, interview length is only 15 minutes, and the purpose of the survey and its government sponsorship will be made known to the respondent. The following techniques will be used to increase the response rate:

1. Developing answers for the questions and objections that may arise during the interview.
2. Leaving message on answering machine with a toll free number .
3. Employing multi-lingual interviewers to reduce language barriers.
4. Eliminating non-residential numbers from sample.
5. Calling back respondents who initially refused or broke-off interview.

Callback procedures will also improve response rate. The contractor will review refusals and initiate another call with a refusal script. Callbacks will be scheduled and prioritized based upon the following criteria: first priority--scheduled callback to qualified household member; second priority--scheduled callback to “qualify” household (includes contact with Spanish language barrier households); third priority--callback to make initial contact with household (includes answering machine, busy, ring no answer); and fourth priority--callbacks that are the seventh or higher attempts to schedule interview.

Scheduled callbacks can be dialed at anytime during calling hours and as frequently as requested by the callback household up to five times. Callback attempts in excess of five are at the discretion of the interviewer based upon his/her perception of the likelihood of completing the interview. The basis of the interviewer’s perception, in part, will be determined by how vigorously the interviewer is being encouraged to call back to complete the interview by the potential respondent or another member of the household. The interviewer will then confer with a supervisor and a final determination will be made as to if the interviewer will continue calling.

Callbacks to Spanish language barrier households will be conducted by Spanish-speaking interviewers. Non Spanish-speaking interviewers who reach a Spanish-speaking household will schedule a callback that will be routed to a Spanish-speaking interviewer.

Callbacks for initial contact with potential respondents will be distributed across the various calling time periods and weekday/weekend to ensure that a callback is initiated during each time period each day. Two (Saturday and Sunday) to three (Monday through

Friday) callbacks per number will be initiated per day assuming the number retains a callback status during the calling. There will be up to ten callback attempts without having reached a person. This protocol is designed for ring no answer and answering machines. When an interviewer reaches a household with an answering machine during the seventh time calling the interviewer will leave a message with the respective appropriate 800 number.

Callbacks to numbers with a busy signal will be scheduled every 30 minutes until the household is reached, disposition is modified, maximum callbacks are achieved or the study is completed.

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

The most important elements of the study design of the Speed Management Demonstration Project are:

- 1) The survey population is defined as total non-institutionalized licensed driver population, age 18 and older, residing in Tucson, AZ and the control site area(s) households having telephones.
- 2) The survey will be conducted by telephone, using computer-assisted telephone interviewing from the contractor's telephone center located in Philadelphia, Pennsylvania.
- 3) The survey will be administered twice; once before and once after the countermeasure program is introduced.
- 4) Identical methods will be used to generate probability samples for the surveyed locations. The before and after samples will be drawn independently for each location.
- 5) A probability sample of telephone households in Tucson, AZ and the control site(s) will be drawn using a List-Assisted Random Digit Dialing scheme.
- 6) Within a selected household one eligible licensed driver (18 or older) will be selected randomly using the "next birthday" scheme.
- 7) In total, fielding interviews will be completed with 1,600 people ages 18 and older. The questionnaire focuses on awareness and support for the Speed Management intervention and of Automated Speed Enforcement.
- 8) The survey will include a Spanish language version of the questionnaires used by bilingual interviewers to minimize language barriers.
- 9) Interviewers experienced in conducting phone surveys will be selected and trained.

- 10) Call will be made during morning, afternoon and evening hours from 9a.m. to 9p.m. local time, Monday through Sunday. The time of calling an individual respondent will be varied to increase response rates among hard-to-find potential respondents.

B.2.1 Sampling Frame

The purpose of this study is to determine the effect of the countermeasure program introduced on the adult licensed driver population of Tucson, AZ. A control site for the demonstration will include the adult licensed population also. The frame consists of households that contain one or more licensed drivers. Since, this is a telephone survey, the universe of households will be represented by the frame of household telephone numbers in these cities. Non-telephone households, which represent a small percentage of all households, will not be represented in the universe.

B.2.2 Random Digit Dialing Procedures

Random digit dialing (RDD) will be used to select telephone numbers within selected exchanges for household contact. Telephone numbers in the United States are 10 digits long - where the first three numbers are the area code, the next three are the exchange, and the last four numbers are the number within the exchange. The first two digits of the four digit number define a cluster, with each cluster containing 100 numbers or a “100-bank” (the last two digits). Selection will be made from those 100-banks containing residential listings. From the 100- banks, a two-digit number is randomly generated. Therefore, every telephone number within the 100- banks has an equal probability of selection, regardless of whether it is listed or unlisted.

B.2.3 Selection of Respondent within Households

The sample construction described above yields a population-based, random-digit dialing sample of telephone numbers. A random selection procedure will be used to select one designated respondent for each household sampled. The “next birthday method” will be used within household selection among multiple eligible respondents. Salmon and Nichols (1983²) proposed the birthday selection method as a less obtrusive method of selection than the traditional grid selections of Kish, et al. In theory, birthday selection methods represent true random selection (Lavrakas, 1987³). Empirical studies indicate that the birthday method produces shorter interviews with higher response rates than grid selection (Tarnai, Rosa and Scott, 1987⁴).

² Salmon, C. and Nichols, J. *The Next-Birthday Method of Respondent Selection*. Public Opinion Quarterly, 1983, Vol. 47, pp. 270-276.

³ Lavrakas, P. *Telephone Survey Methods: Sampling, Selection and Supervision*. Beverly Hills: Sage Publications, 1987.

⁴ Tarnai, J., Rosa, E. and Scott, L. *An Empirical Comparison of the Kish and the Most Recent Birthday Method for Selecting a Random Household Respondent in Telephone Surveys*. Presented at the Annual Meeting of the American Association for Public Opinion Research. Hershey, PA, 1987.

Upon contacting the household, interviewers will briefly state the purpose of their call (including noting the anonymity of the interviewee), and then request to speak to the person in the household within the eligible age range who will have the next birthday. The CATI system will be programmed to accept the person with the next birthday. If the person who answered the phone is the selected respondent, then the interviewer will proceed with the interview. If the selected respondent is someone else who then comes to the phone, then the interviewer will again introduce the survey (with anonymity statement) and proceed with the interview. If the selected respondent is not available, then the interviewer will arrange a callback.

B.2.4 Precision of Sample Estimates

The objective of the sampling procedures described above is to produce a representative probability sample of the target population. A random sample shares the same properties and characteristics of the total population from which it is drawn, subject to a certain level of sampling error. This means that with a properly drawn sample one can make statements about the properties and characteristics of the total population within certain specified limits of certainty (confidence limits) and sampling variability. The confidence interval for sample estimates of population proportions, using simple random sampling without replacement, is calculated by the following formula:

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

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 level)

Using this formula, the maximum expected sampling error at the 95% confidence level (i.e., in 95 out of 100 repeated samples) for a total sample of 400 is $\pm 5\%$ percentage points. It should be noted that the maximum sampling error is based upon the conservative estimate that $p = q = 0.5$.

This is an a priori estimate of precision. The standard error may be larger because of factors such as response rates and applied sampling weights. To test whether significant differences exist between proportions from different samples such as between before and after samples the following procedure and formula applies:

- **First:** We state the hypothesis to be tested. The hypothesis being tested is called the *null hypothesis* and is denoted H_0 . Often, the null hypothesis states a specific

value for a population parameter. The null hypothesis in this study is: for the phone surveys there will not be a significant difference between the test group time one and time two attitudinal difference and the control group time one and time two attitudinal difference toward automated speed enforcement.

- **Second:** We choose the level of significance at which the test will be performed. This is called the *size* or *level* of the test. It is the probability of rejecting the null hypothesis when it is true. The level of the test determines the values of the test statistic (such as *t*) that would cause us to reject the hypothesis. The significance level will be .05 for this study.
- **Third:** We then, **and only then**, collect the data and reject the hypothesis or not depending on the observed value of the test statistic.

For example, if $H_0: \mu_x = \mu_y$ (which can be rewritten $H_0: \mu_x - \mu_y = 0$), the test statistic is:

$$z = \frac{\bar{x} - \bar{y}}{\sqrt{\frac{s_x^2}{n_x} + \frac{s_y^2}{n_y}}}$$

If $|z| > 1.96$, reject $H_0: \mu_x = \mu_y$ at the .05 level of significance

Where \bar{x} is equivalent to p_1 and \bar{y} is equivalent to p_2 .

We conducted an analysis of the possible differences that might arise when testing the null hypothesis (that there will not be a significant difference between the test group time one and time two attitudinal difference and the control group time one and time two attitudinal difference toward automated speed enforcement) for the phone surveys. The responses to Question 10 (Q10) (**How do you feel about photo radar enforcement cameras recording drivers exceeding the speed limit?**) are the basis for testing the null hypothesis. There are four possible answers to Q10 which have been dichotomized for purposes of this analysis.

The answers “Strongly Approve” and “Approve” are designated as P and “Disapprove” and “Strongly Disapprove” are designated as Q, where $P+Q = 1$.

Since there are before and after surveys in Tucson and a control city, we wish to determine if there is a significant difference between the survey results of the before and after survey for each location. Next, we examine the before and after survey results for the dichotomized responses to Question 10. We have designated Δ_1 as the differences in results for Tucson and Δ_0 for the control city differences.

Test of Significance

First, we calculate whether combinations differences between Δ_1 (test site of Tucson) and Δ_0 (control site) will be significant at the 5% significance level with a two-tail test. The following table shows the outcome for selected combinations of values that will demonstrate a significant difference.

EXAMPLES OF DIFFERENCES THAT ARE SIGNIFICANT

Δ_1	Δ_0
0.3	0.1
0.3	0.2
0.3	0.4
0.4	0.1
0.4	0.2
0.4	0.3
0.5	0.1
0.5	0.2
0.5	0.3
0.5	0.4

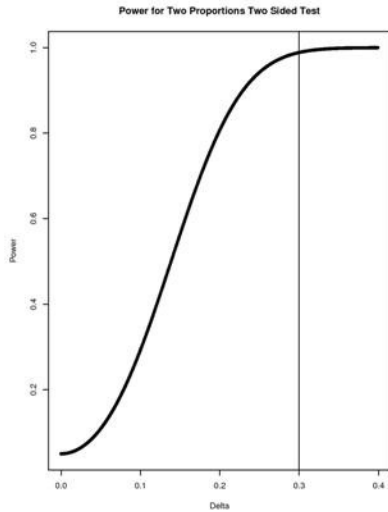
Here we see that in the first case where there is a 30 percent (0.3) change in attitudes in the test site and a 10 percent (0.1) change in the control site, there is a significant difference. This means if the test site shows an approval (or disapproval) change of thirty percent and the control site shows an approval (or disapproval) change of 10 percent the results will be statistically significant. The same holds true for the other combinations listed above. Virtually all differences between the Δ values of 10 percentage points are significant at the .05% level for a two-tailed test. If the difference between Δ_1 and Δ_0 is less than 5 percentage points it is likely that the differences will not be significant.

Power Analysis

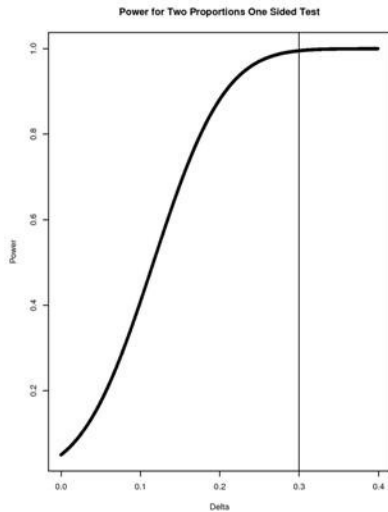
Power is defined as 1-Probability of a Type II error and the Type II error is the probability of not rejecting the null hypothesis when it is false.

We conducted a power analysis for possible values of Δ_1 and Δ_0 . The following two graphs display the results for a two sided (.05) and one sided test of significance.

The first graph indicates that if Δ_1 is .3 and Δ_0 is .2 the power value is about .8 and if Δ_1 is .3 and Δ_0 is .1, the power value decreases to about .3.



Virtually the same results are obtained for a one tailed power analysis. For instance, if $\Delta_1 = .3$ and Δ_0 is .2 the power value is .8



B.2.5 Data Collection

Data collection for this survey will be conducted from the phone banks of an organization experienced in conducting large-scale national surveys. The contractor will administer the survey using computer-assisted telephone interviewing (CATI), and will have sufficient numbers of CATI stations to conduct the survey.

All interviewers on the project will have been previously trained in effective interviewing

techniques as a condition of their employment. The contractor will develop an interview manual for this survey, and conduct a training session specific to this study with all interviewers prior to their conducting any interviews.

Interviewing will be conducted on a schedule designed to facilitate successful contact with targeted households (concentrating on weekends and weekday evenings). Interviewers will make 10 call attempts to ring no answer numbers before the number is classified as a permanent no answer. These call attempts shall be made at different times, on different days over a number of weeks, according to a standard call attempt strategy. However, the 10 call attempt protocol shall only apply to telephone numbers where nobody picks up the telephone. If someone picks up the phone but terminates the contact before in-house selection of a subject can be made, then the Contractor shall apply an alternative protocol of additional contact attempts designed to maximize participation but yet not annoy the prospective household participant. This alternative protocol will further diversify the calling days (weekdays and weekends) and times (morning, afternoon, and evening) to reach the respondent.

The Contractor shall implement a plan for gaining participation from persons in households where telephone contact is made with an answering machine. The Contractor shall leave a message on the machine encouraging survey participation and providing information that the household member can use to verify the legitimacy of the survey and contact the Contractor. The Contractor shall set up a toll free number that the prospective survey participant can call. The Contractor may also note these sources of verification to persons directly contacted on the phone if that would be deemed helpful in getting their participation.

When the household is reached, the interviewer will use a systematic procedure to randomly select one respondent from the household. If the respondent is reached but an interview, at that time, is inconvenient or inappropriate, the interviewer will set up an appointment with the respondent. If contact is made with the household, but not the designated respondent, the interviewer will probe for an appropriate callback time to set up an appointment. If contact is made with the eligible respondent, but the respondent refuses to participate, then the interviewer will record information for use in refusal conversion to be conducted at a later time (see section B.3.).

If the case is designated as Spanish language, it will be turned over to a Spanish-speaking interviewer. If the interviewer encounters a language barrier, the interviewer will thank the person and terminate the call. All interviewers on the study will be supervised in a manner designed to maintain high quality control. One component of this supervision will entail periodic monitoring of interviewers while they are working. Through computer and phone technology, supervisors can silently monitor an interviewer's work without the awareness of either the interviewer or respondent. Second, supervisors will check interviewers' completed work for accuracy and completeness.

B.2.6 Sample Weighting

The Contractor will carry out a multi-stage sequential process of weighting the survey

data. Since this is RDD telephone survey, the base weight is the inverse of the probability of selecting a telephone number and is the number of telephone numbers in the frame divided by the sample of telephone numbers. For instance, nationwide, there are approximately three hundred million telephone numbers and for a nationwide sample of 1,000 households, the weight would be three hundred million/1,000 or 300,000. Further weighting adjustments are applied including at least the following essential adjustments:

- a. Nonresidential telephones
- b. Screener nonresponse
- c. Multiple telephone households
- d. Person selected within household

The previous steps correct the achieved sample for known biases in sample selection. There is also a self-selection bias in sample surveys in which participation is voluntary. Some self-selection biases in telephone surveys involve age, sex, race, household size, region, and urbanicity. A fourth weighting procedure will weight the (weighted) sample to the distribution of the population, using the Census Population Projections for characteristics of particular concern.

B.2.7 Variance Estimation

The statistics p and q are calculated from a probability sample of the entire population and are considered point estimates. Statistical theory enables us to make statements about the likelihood that the true population value is contained within a range. This range is commonly referred to as a confidence interval. Statistical formulae can be used to determine the lower and upper limit of the confidence interval. How close the upper and lower limits are, that is, the difference between the two values, determines the precision.

Generally, there are two factors that affect precision: sample size and data variability (the range of different values in a population). As the sample increases in size, the lower and upper limit values move closer to the value of p —that is, the estimate becomes more accurate. For example, consider a car repair survey. The larger the sample of owners selected, the more precise the estimates become. The upper and lower limits define the precision interval for a value of p and the level of certainty, which is 95 percent for all calculations in this document. Therefore, precision calculations were made before the survey for planning purposes and will be made after the survey is completed. The post survey calculations of precision will be more exact than the a priori estimates.

The estimates from a sample survey can be affected by non-sampling errors. Non-sampling errors can be generated by a variety of sources in the data collection and data processing phases of the survey. All possible steps will be taken to avoid the introduction of non-sampling error during the course of the survey.

A sampling error is usually measured in terms of the standard error of a particular statistic (e.g., proportion, mean), which is the square root of the variance. The standard error can be used to calculate confidence intervals about the sample estimate within which the true value for the population can be assumed to fall with a certain probability. The probability for the confidence interval can be set at different levels depending on the needs of the analysis.

The standard statistical formulas for calculating sampling error are based on the assumption of a simple random sample. The report produced from this project is intended for an audience that has limited interest in confidence intervals and, hence, the report tables do not include variance estimates. However, the methods report will provide estimates of the confidence intervals for the key variables from the survey.

B.2.8 Statistical Analysis

A detailed plan will be developed to analyze the survey results. The plan will define: (1) the purpose of the survey, (2) the objectives of the research (the main areas of investigation), (3) the data or variables to be investigated, (4) the analytic approaches and methods to be used to achieve the research objectives, and (5) the preliminary tabulations to be prepared from the completed data file after the data are processed. The kinds of analytical activities are:

1. Descriptive

This straightforward approach involves working out statistical distributions, constructing tables and graphs, and calculating simple measures such as means, medians, totals and percentages.

Statistical descriptions are the tabulations after the data are processed, to aggregate the features of the data file. Statistical descriptions often are reported in series, one variable or research question at a time being cross-classified with others, thus producing a descriptive summary of the potential associations between the study variables.

2. Inferential

Statistical inference is the linking of the results derived from data collected from or about a sample to the population from which the sample was drawn. Inference is the principal approach for analyzing the survey data and inferences can be made because the data are collected from a probability sample. Estimates will be made of the population characteristics from the sample as well as sampling errors.

3. Analytic Interpretation

Attempts will be made to explain the relationships and differences between variables using various statistical analyses and inference testing techniques. There are a number of statistical tools available for conducting these analyses including tests of significance, regression analyses, discriminant analyses, and others.

Constructing the analysis plan is a multi-step process. The project office should develop this with the assistance of Agency statisticians, computer programmers, specialists in the subject area of the research, and systems analysts, as appropriate.

B.3. Describe methods to maximize response rates and to deal with issues of non-response.

In order to attain the highest possible response rate, an interviewing strategy with the following major components will be followed. The initial contact script has been carefully developed and refined to be persuasive and appealing to the respondents. Only thoroughly trained and experienced interviewers, highly motivated and carefully monitored, will conduct the interviewing. During a two-day training program, interviewers and supervisors will be trained on every aspect of the survey. Emphasis will be placed on how to overcome initial reluctance, disinterest or hostility during the contact phase of the interview. The interviewing and supervisory team will include Spanish-speaking personnel to ensure that Spanish language is not a barrier to survey participation. The Contractor will make ten attempts to reach no-answer telephone numbers, and an interviewer will leave an approved message on answering machines according to study protocol.

The CATI program will record all refusals and interview terminations in a permanent file, including the nature, reason, time, circumstances and the interviewer. This information will be reviewed on an ongoing basis to identify any problems with the contact script, interviewing procedures, questionnaire items, etc., and the refusal rate by interviewer will be closely monitored. Using these analyses, a "Conversion Script" will be developed. This script will provide interviewers with responses to the more common reasons given by persons for not wanting to participate in the survey. The responses are designed to allay concerns or problems expressed by the telephone contacts.

The contractor will implement a soft refusal conversion plan in which each person selected for the sample who refuses to participate will be re-contacted by the contractor approximately one-to-two weeks following the refusal. The contractor will use the conversion script in an attempt to convince the individual to reconsider and participate in the survey. Only the most skilled interviewers will conduct the refusal conversions. Exceptions to refusal conversion will be allowed on an individual basis if for some reason the refusal conversion effort is deemed inappropriate.

There will be maintenance and regular review of field outcome data in the sample

reporting file, derived from both the sample control and CATI files, so that patterns and problems in both response rate and production rates can be detected and analyzed. 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.

Previous surveys performed by the contractor performing similar surveys have achieved response rates over 50%. The 2006-2007 U.S. Department of Housing and Urban Development (HUD) Fair Market Rent Random Digit Dialing survey obtained an AAPOR Response Rate 3 of 52.8% for Los Angeles and 58.9% for Hawaii County with cooperation rates over 97%. In 2007-2008 HUD Fair Market Rent surveys obtained response rates of 78% in Duchesne and Uintah Counties, Utah, 50.2 % in Midland County, TX, 55.5% in Mesa County, Colorado, 62.7% in Ector County, Texas, 66.8% in Sweetwater, Uinta (Wyoming) and Moffat (Utah) Counties and 74.6% in Natrona County, Wyoming.

Non-Response Analysis

The two types – unit non-response and item non-response will be evaluated. A decision will be made as to what constitutes a usable return and a recognized formula will be used to calculate the overall response rate. The comparison of the characteristics of the completed and non-completed cases from the random digit dial sample will be conducted to determine whether there is any evidence of non-response bias in the completed sample.

Item non-response occurs when a response to a single question is missing and its impact on survey statistics can be as severe as unit non-response. Only certain statistics may be affected by item non-response and these will probably be the most sensitive questions on the questionnaire. It may be possible to use imputation methods to alleviate the impact of significant item non-response.

As the sample size is small, (two administrations at 800 interviews per administration), and the survey will employ a simple pre and post administration analysis, it is anticipated that any bias in the population will be present to an equal degree during both administrations. Nevertheless, NHTSA is concerned with any biases in the sample population and will look for any systematic trends that may indicate a refusal bias or any differences in the sample population. A comparison of the characteristics of the completed and non-completed cases from the random digit dialing sample will be conducted to determine whether there is any evidence of significant non-response bias in the completed sample. Sample characteristics will be collected during the course of the telephone survey. Any biases found in the sample population will be noted in the final report.

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

The contractor will pre-test the survey calling an overall total of approximately 20

residents from Tucson and the control site(s) prior to fielding. Any problematic issues that are noted will be addressed and adjustments to the survey instrument will be made as appropriate.

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

The following individuals have reviewed technical and statistical aspects of procedures that will be used to conduct the 2008 Survey:

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