



## **TELEPHONE CARAVAN® Methodology**

The following pages describe the methodology used for the ORC International Telephone CARAVAN® survey conducted December 8-11, 2016.

The study was conducted using two probability samples: randomly selected landline telephone numbers and randomly selected mobile (cell) telephone numbers. The combined sample consists of 1,008 adults (18 years old and older) living in the continental United States. Of the 1,008 interviews, 506 were from the landline sample and 502 from the cell phone sample. The margin of error for the sample of 1,008 is +/- 3.09% at the 95% confidence level. Smaller subgroups will have larger error margins.

Surveys are collected by trained and supervised US based interviewers using ORC International's computer assisted telephone interviewing (CATI) system. Final data is adjusted to consider the two sample frames and then weighted by age, gender, region, race/ethnicity and education to be proportionally representative of the US adult population.

As a founding member of the Code of Standards of the Council of American Survey Research Organizations (CASRO) and a member of the European Society for Opinion and Marketing Research (ESOMAR), we adhere to a rigorous Code of Standards and Ethics for Survey Research. As required by CASRO, we will maintain the anonymity of our respondents. No information will be released that in any way will reveal the identity of a respondent. Our authorization is required for any publication of the research findings or their implications.

### **Sampling**

Telephone CARAVAN® uses a dual frame sampling design. This means that the sample is drawn from two independent sample frames—one for landlines and one for cell phones.

#### **Landline Sample**

ORC International's Random Digit Dial (RDD) telephone sample is generated using a list-assisted methodology. That is, the updated white page listings that are used to identify telephone number banks (the first 8 digits of the phone number) with a listed phone number in them. The standard that we use is 2+, meaning that a bank needs to have 2 or more listed households to be considered working. We use the Genesys Sampling in-house system to generate list-assisted Random Digit Dialing sample.

The standard GENESYS RDD methodology produces a strict single stage, EPSEM (Equal Opportunity of Selection Method) sample of residential telephone numbers. In other words, a GENESYS RDD sample ensures an equal and known probability of selection for every residential telephone number in the sample frame.

#### **Cell Phone Sample**

The cell phone sample, also RDD, has been supplied by SSI, Inc. using their proprietary Cell/WINS technology. The cell phone sample is generated from cell phone 1,000 series blocks with all the 100 series banks within each block turned on. The sampling interval is

then calculated by dividing the universe of all possible numbers by the number of records desired, thus specifying the size of the frame subdivisions. Within each of the subsets one number is selected at random giving all numbers an equal probability of selection.

### **Weighting**

In probability-based samples such as CARAVAN®, the basis of the weighting is the inverse of the selection probability. Then, weighting adjustments are frequently used to reduce the potential for biases that may be present due to incomplete frame coverage and survey nonresponse--both inherent in all telephone surveys. These adjustments may take advantage of geographic, demographic, and socioeconomic information that are known for the population and measured in the sample surveys. The adjustments reduce potential bias to the extent that the survey respondents and nonrespondents (noncontacts, refusals, etc.) with similar geographic, demographic, and socioeconomic characteristics are also similar with respect to the survey statistics of interest. In other words, post-survey weighting adjustments reduce bias if the weighting variables are related to (correlated with) the survey measures and the likelihood of survey participation.

The CARAVAN® *landline-cell* combined sample is a dual frame sampling design. This means that the sample is drawn from two independent sampling frames—one for landlines and one for cell phones. Adults with a landline but no cell phone (A) must be reached through a landline telephone sample. Adults with a cell phone and no landline (C) must be reached through the cell phone sample. Adults with both a landline and a cell phone (B) can be reached through either of the frames. Sampling from the two frames results in these four groups:

- $a_1$ : Landline respondents without a cell phone (landline only)
- $b_1$ : Landline respondents with a cell phone (dual user)
- $b_2$ : Cell phone respondents with a landline (dual user)
- $c_2$ : Cell phone respondents without a landline (cell only)

The dual user groups ( $b_1, b_2$ ) are further classified into two subgroups:

*Cell mostly*: those who receive most calls on a cell phone

*Landline mostly/Mixed use*: those who receive most calls on a landline or who receive calls on both regularly

The National Health Interview Survey (NHIS) provides estimates of these user group populations. We weight-adjust the landline sample and the cell sample to their respective population proportions as reported from the NHIS. Once this design weight is calculated, the combined sample is weighted to represent the US population using data from the US Census Bureau's American Community Survey (CPS). This form of weighting is referred to as *calibration weighting*<sup>i</sup> in that survey respondents are assigned weights that are calibrated to reflect the population. The calibration weighting for CARAVAN® is based on a series of ratio adjustments called iterative proportional fitting, or "*raking*"<sup>ii</sup>, which was first introduced by Deming and Stephan for use in the 1940 US census.



### **Definition of Classification Terms**

The following definitions are provided for some of the standard demographics by which the results are tabulated. Other demographics are self-explanatory.

### **Income**

The income groupings refer to the total household income for 2015 before taxes.

### **Geographic Region**

The states are contained in four geographic regions as follows:

#### **North East**

- New England: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut
- Middle Atlantic: New York, New Jersey, Pennsylvania

#### **Midwest**

- East North Central: Ohio, Indiana, Illinois, Michigan, Wisconsin
- West North Central: Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas

#### **South**

- South Atlantic: Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida
- East South Central: Kentucky, Tennessee, Alabama, Mississippi
- West South Central: Arkansas, Louisiana, Oklahoma, Texas

#### **West**

- Mountain: Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada
- Pacific: Washington, Oregon, California, Hawaii, Alaska



## **About ORC International**

ORC International is a collaborative and consultative research partner to hundreds of organizations around the globe. We possess a wide variety of resources, tools and technologies to collect and analyze information for our clients.

ORC International is ISO 20252 certified. To achieve certification, ORC International passed a comprehensive, on-site audit. The certification establishes globally recognized terms, definitions, and service requirements for project management in research organizations. Processes outlined in ISO 20252 are designed to produce transparent, consistent, well documented and error-free methods of conducting and managing research projects. Adherence and certification to such standards provides a basis of confidence for clients and other constituencies that the work produced is being executed with quality processes and controls in place. The internationally recognized standard also provides a basis for subcontractor evaluation.

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<sup>i</sup> For a summary of calibration weighting, refer to Kalton, G. and I. Flores-Cervantes (2003) “Weighting Methods”, *Journal of Official Statistics*.

<sup>ii</sup> Deming, W. E. and F. F. Stephan (1940) “On a Least Squares Adjustment of a Sampled Frequency Table When the Expected Marginal Totals are Known,” *Annals of Mathematical Statistics*.

Question F2

Federal and state standards now require automobile manufacturers to increase the fuel economy of the new cars they sell to an on-road average of 42 miles per gallon by 2025. What is your view of this increase in fuel economy standards? Would you say you...

	Supported in 2016 Presidential Election				No one
	Total	Donald Trump	Hillary Clinton	Another candidate	
	(A)	(B)	(C)	(D)	(E)
Unweighted Total	1008	335	325	80	179
Weighted Total	1008	295	307	87*	240
Support (Net)	763 76%	201 68%	256 83%BE	70 80%	171 71%
Support strongly	451 45%	99 33%	182 59%BE	42 48%B	102 42%
Support somewhat	312 31%	103 35%C	74 24%	28 32%	69 29%
Oppose (Net)	214 21%	85 29%C	42 14%	17 19%	58 24%C
Oppose somewhat	108 11%	42 14%C	17 5%	8 10%	34 14%C
Oppose strongly	105 10%	43 15%C	25 8%	8 10%	24 10%
Don't know	32 3%	9 3%	9 3%	1 1%	11 5%

Proportions/Mean: Columns Tested (5% risk level) - B/C/D/E  
Overlap formulae used. \* small base