



## FHWA NHTS REPORT

### About the NHTS

Conducted periodically since 1969 by the Federal Highway Administration, the NHTS collects travel data from a sample of U.S. households. The information is used to understand trends in the Nation's trip-making and miles of travel by mode, purpose, and time-of-day for use in policy, planning, and safety.

Data are collected for household members for each day of the year, yielding a rich demographic profile linked to daily travel and vehicle characteristics.

### For more information:

<http://nhts.ornl.gov>



U.S. Department of Transportation  
**Federal Highway Administration**

# FHWA NHTS REPORT

*Travel Survey State of the Practice*

March 2023

## Introduction

The purpose of this report is twofold: document the Federal Highway Administration (FHWA) 2022 NextGen National Household Travel Survey (2022 NHTS) core data collection effort, design, and approach; and provide an overview of the travel survey state of the practice as context against which to assess the 2022 design, including elements such as sampling strategies, data elements, survey modes, recruitment approaches, and use of incentives.

## NextGen NHTS Overview

In 2019, FHWA celebrated the 50th anniversary of its NHTS program. Conducted every 5 to 8 years since its inception in 1969, the NHTS is the authoritative source on the travel behavior of the American public. NHTS is the only source of national data that allows one to analyze trends in personal and household travel by all modes, including the characteristics of the people traveling, their household, and their vehicles.

Over the past 50-plus years, the NHTS design has evolved, reflecting changes in survey practice and technological evolution. The 1969, 1977, and 1983 surveys were collected on paper via in-home interviews. With the 1990 survey, the design transitioned to telephone interviews using computer-aided telephone interviewing (CATI) technology, which continued to serve as the survey mode through the 2009 effort. In 2017, the NHTS migrated to a combined telephone/online survey mode, which allowed respondents to capture their travel using a Google-enabled application-based programming interface (API) mapping tool for the first time. Throughout these 50 years, the NHTS core content has remained stable and focused on documenting the who, what, where, when, and how of daily household travel in the United States.

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Following the 2017 NHTS, FHWA spent considerable time evaluating cost-effective approaches to data collection that reduced respondent burden without sacrificing the core data needs of detailed travel behaviors and modes and that could leverage the emerging private sector datasets. The result was the NextGen NHTS. The NextGen NHTS offers two complementary datasets: traditional, core data collected via a household travel survey approach, and passenger and truck origin–destination (OD) data products developed using passive data from private-sector sources. This report focuses on the core data component.<sup>1</sup>

The core data component of the NextGen NHTS provides travel behavior data that document current mobility patterns at the national, census division, and urban/rural geographical levels. The ability to trend key travel metrics, such as person trips and person miles traveled, vehicle trips and vehicle miles traveled, mode usage, time of day of travel, and levels of telecommuting and online shopping, is an important part of the NextGen NHTS core data survey design. The design balances the collection of travel behavior data with reducing respondent burden and improving participation rates. As a result, the 2022 NHTS collects fewer surveys (7,500 households nationally compared to 26,000 households in 2017), asks fewer questions (focusing on data needed for trending key metrics), and will be conducted more frequently (biennially beginning in 2022). The surveys will continue to capture household travel over an assigned 24-hour period, with household reporting equally distributed across all 7 days of the week and all 365 days in a year.

The contract to conduct the 2022 data collection cycle was awarded through a competitive process in fall 2019 to Ipsos. Founded in 1975, Ipsos is the third-largest global market research company and has conducted more than 47 million interviews in the past 45 years, with almost half of those interviews conducted online. The 2022 NHTS launched January 18, 2022, and was fielded for 1-year. In addition to the national effort, the 2022 NHTS includes add-on samples purchased by the Tennessee Department of Transportation (DOT) (5,000 households), Virginia DOT (11,000 households), and the Oahu Metropolitan Planning Organization (MPO) (2,500 households).

The following are key design components of the 2022 NHTS:

- **Sampling:** National samples include a traditional address-based sample (ABS) of 7,500 households and a parallel sample of 7,500 households from the Ipsos Knowledge Panel (KP), which is a probability-based panel frame sample (PFS). The ABS results will serve as the official source for statistics, and an independent evaluation team will compare the results between the two studies to help inform the use of PFS in future efforts. Both samples employ the same stratification—Urban/Rural by Census Division—with the same targets for each stratum.

The Ipsos KP is a probability-based panel comprised of more than 55,000 U.S. households. KP members were randomly selected from an ABS frame and agreed to participate in surveys. Those without Internet access are provided a tablet and data plan to complete surveys, which helps ensure that the online-only design includes all

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<sup>1</sup> For more details on the OD products, see <https://nhts.ornl.gov/od>.

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types of households. An advantage of the PFS is that the demographic characteristics of households are known in advance so each month, new selected samples will be released to help balance out the gaps typically caused by hard-to-reach households. The independent evaluation will consider whether the PFS provides a probability-based survey with higher respondent rates, lower non-response bias, and lower costs compared to the traditional ABS approach.

- **Data elements:** The national survey design maintains the core NHTS questions regarding demographics and travel-day behavior (e.g., mode, purpose, trip start and end time). It also includes supplemental questions about the most recent long-distance trip, the impact of the COVID-19 pandemic on travel patterns, and the use of emerging travel modes. The 2022 NHTS is the first to collect data on both personal and commercial travel made using household-owned vehicles (e.g., ridesharing and food delivery).
- **Survey mode:** The 2022 survey is predominantly online, with a mail version offered for those without Internet access or who are uncomfortable with such technology. The online program guides respondents through reporting household characteristics and then, after creating a roster of household members and vehicle details, collects details for 1 day of travel from each household member ages 5 and older. The program, which includes a Google API for mapping trip destinations, is programmed to efficiently guide respondents through the questions with built-in “skips” where questions may not be applicable based on answers to prior questions.
- **Recruitment:** For the ABS, households receive an invitation letter in a 9 by 12-inch envelope. The letter introduces the study, answers frequently asked questions, and provides a link to the online survey as well as a toll-free number to call to request a hardcopy version. The invitation letter is followed by two follow-up postcards and a reminder letter—four mailings in all—to encourage participation. The mailed materials, which are signed by the NHTS program manager at FHWA, include the U.S. DOT logo on the envelope/postcard and introduce Ipsos as the firm conducting the survey on behalf of FHWA.

For the PFS, which is exclusively online, panelists receive an advance email notifying them of the upcoming survey about their daily travel. This is followed by the actual survey invitation with a link to the same online survey portal used for the ABS. Reminder follow-up emails are also sent to encourage participation.

- **Use of incentives:** For the ABS, a \$2 bill is affixed to the invitation letter. Households are offered \$10 to complete the household profile, then \$5 for each household member ages 5 and older who reports their travel for the 24-hour period. PFS participants receive an equivalent incentive within the KP point system.

The following summarizes the state of the practice for conducting travel surveys in the United States today, and provides insights from the general survey industry. The 2022 NHTS design features parallel those currently in use and are anticipated to provide a robust picture of household travel behavior in the post-pandemic United States.

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## State of the Practice: Sampling Strategies

Travel survey sampling can be done several ways depending on the specific geographic scale, available technology, and intent of the sampling frame. The 2022 NHTS employs a dual-frame sampling approach of parallel studies using ABS and PFS sampling frames. This section provides a brief overview of each of these strategies and explains why a non-probability-based sampling strategy was not considered for the 2022 NHTS.

### ABS

The most common approach used for large-scale travel demand survey sampling is the ABS approach. This approach randomly samples households within a specified geographic area (e.g., county or metropolitan statistical area). Using Census sociodemographic distributions appended to a U.S. Postal Service (USPS) address file, the expected demographic makeup for a given geographic area can be determined and used to define a strong sample frame. ABS can be available for hard-to-reach geographies or subpopulations, and according to the American Association of Public Opinion Research (AAPOR), today's ABS are the best frames available for national U.S. household surveys.<sup>2</sup> ABS cover more than 99 percent of households and are highly efficient given their non-clustered nature. Because ABS normally relies on a mail-based survey mode, the potential to better capture dense, urban living arrangements can improve coverage of individuals using transit.

Although ABS has been used for decades, it has drawbacks (e.g., under-representation of lower socioeconomic persons, non-native English speakers, minorities). Another notable drawback is the increased cost to ensure a decent response rate. Edwards et al. (2014) found that regional and state-level mail-only surveys have a mean response rate of 52 percent (much higher than phone surveys and Federally sponsored mail-only surveys) so designers should take this into consideration when planning the survey's recruitment strategy. As such, the initial recruitment phase can be more costly and require greater effort with ABS compared to other strategies and there is ample documentation on how to overcome these shortcomings.

### PFS

The second sampling strategy used in the 2022 NHTS is the PFS. This approach uses a randomly selected sample pulled from an established online probability-based panel sample (i.e., Ipsos's proprietary KP) offering the advantages of skipping the initial recruitment phase present in traditional ABS approaches while also avoiding the "opt-in" nature commonly seen in online surveys. Callegaro et al. (2014) found that the quality of panel samples can be similar to well-designed mail samples. However, additional research is needed on using PFS to measure travel behavior at a national level.

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<sup>2</sup> American Association for Public Opinion Research (AAPOR). (2016). *AAPOR Report: Address-Based Sampling*. Available at: <https://www.aapor.org/Education-Resources/Reports/Address-based-Sampling.aspx#1.2%20What%20is%20Address-based%20Sampling>.

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PFS is rapidly gaining popularity in the survey industry as a viable alternative to traditional ABS. Because a pool of respondents is pre-recruited using probability-based methods, the initial recruitment phase can be skipped, saving both time and money. Compared to other strategies, PFS allows panelists to be more easily recruited for follow-up surveys or longitudinal studies, which provides a unique perspective on specific trends and changes in travel behavior.

### **Non-Probability-Based Sampling**

The third sampling strategy is known as non-probability-based sampling. This approach consists of a multitude of sampling approaches—the most prominent being convenience sampling. Although non-probability-based sampling is widely used in the social science and medical disciplines when testing specific effects, its validity for garnering statistical inferences of a general population is highly scrutinized by policymakers and decisionmakers alike.

In the context of travel behavior surveys, popular usage of non-probability-based sampling includes intercept surveys, snowball sampling-supported surveys, and other “opt-in” approaches. These tactics are most prevalent when travel surveys want to capture harder-to-reach populations (e.g., zero-vehicle, older, or low-income households) or specific modal users (e.g., transit riders or cyclists). In addition, online surveys can use non-probability methods when recruitment relies on respondents self-selecting—or “opting in”—without consideration for the target population’s actual statistical makeup. With these deviations from coherent and clearly defined sampling frame targets (in the case of the 2022 NHTS, the known sociodemographic and geographic distributions of the United States), the burden for ensuring valid and sound statistical inferences increases drastically. As such, AAPOR recommends probability-based sampling approaches whenever possible and practical.<sup>3</sup>

Although non-probability-based sampling can capture data on specific populations or situations, it comes at the cost of additional biases, bureaucratic justification, and increased statistical rigor. The inherent lack of result replicability makes non-probability-based sampling ineffective at inferring travel behavior at a national level.

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<sup>3</sup> American Association for Public Opinion Research (AAPOR). (2013). *Report of the AAPOR Task Force on Non-Probability Sampling*. Available at: <https://www.aapor.org/Education-Resources/Reports/Non-Probability-Sampling.aspx>.

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## State of the Practice: Data Elements

The 2022 NHTS was designed to track and trend key travel behavior metrics (e.g., person trips, person miles traveled, vehicle trips, vehicle miles traveled, mode, purpose, time of day of travel, trip distance, and trip duration). Key demographics include the following:

- Household characteristics (e.g., size, vehicle ownership, dwelling type, income, and composition).
- Person characteristics (e.g., age, sex, race, ethnicity, employment status, and student status).
- Vehicle characteristics (e.g., year, make, model, and fuel type).
- Better student details (a specific variable describing student status, current level, school location, and typical mode to school).
- Enhanced employment questions, particularly those pertinent to telework, use of household vehicles for commercial purposes, and typical mode to work).
- Travel details for all trips made by household members ages 5 years and older for a designated 24-hour period.

Each NHTS includes a roster of questions pertinent to current policy priorities. The 2022 NHTS includes questions that capture details regarding: typical use of rideshare, e-scooters, and bikeshare; use of household vehicles for rideshare, delivery, and other business purposes; reasons for reduced travel; more detailed understanding of the types of goods and services ordered online for home delivery and corresponding returns; recent long-distance travel and use of Amtrak and intercity bus services; and anticipated impact of the COVID-19 pandemic on travel.

To maintain a reasonable respondent burden, the 2022 NHTS does not capture odometer readings, immigration details, factors influencing walk/bike travel, health status, physical activity level, perception of alternative modes, or details on household Internet accesses.

For comparison purposes, the following sections discuss content for similar surveys with respect to demographics, travel behavior, and long-distance travel.

### **Demographic Comparison: Travel Surveys, Other Federal Surveys**

Collecting demographic data is essential in ascertaining how closely a given data collection effort matches the population of interest. Federally sponsored surveys include, in whole or in part, a standard list of demographic questions asked in a similar format based on guidance from the Office of Management and Budget (OMB). These questions can be mapped back to questions from the U.S. Census and the American Community Survey, which are often used as target values when weighting data. Although OMB is currently reviewing some demographic questions—namely, gender and race/ethnicity<sup>4</sup>—and

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<sup>4</sup> <https://www.whitehouse.gov/omb/briefing-room/2022/06/15/reviewing-and-revising-standards-for-maintaining-collecting-and-presenting-federal-data-on-race-and-ethnicity>.

may adjust their guidance in the near future, Federal surveys rely heavily on standard demographic questions when making comparisons to target populations and external data collections from other agencies.

Table 1 lists some of the demographic variables collected in the 2022 NHTS and compares them to Federal data from surveys that captured demographic information. The list of demographic variables is not exhaustive (i.e., there were follow-up questions to some of the demographics listed), but the questions were asked in a similar manner across agencies.

**Table 1. Demographics Included in Federal Surveys**

Demographic	NHTS <sup>1</sup>	NSDDAB <sup>2</sup>	CES <sup>3</sup>	NHIS <sup>4</sup>	NCVS <sup>5</sup>
Gender	X	X	X	X	X
Age	X	X	X	X	—
Race/ethnicity	X	X	X	X	—
Education	X	X	X	X	—
Employment status	X	—	X	X	X
HH income	X	X	X	X	X
Home ownership	X	X	X	X	—
Housing type	X	—	X	—	—
Marital status	X	—	X	X	—
HH size	X	X	X	X	—
Children in HH	X	X	X	X	—
Language used in HH	X	—	—	—	—
English proficiency	X	—	—	—	—
Geography	X	—	X	X	—
Use of a vehicle for job	X	—	—	—	—
Vehicles in HH	X	—	X	—	—

<sup>1</sup> NextGen National Household Travel Survey conducted by the Federal Highway Administration (USDOT).

<sup>2</sup> National Survey of Distracted Driving Attitudes and Behavior conducted by NHTSA/USDOT.

<sup>3</sup> Consumer Expenditure Survey conducted by BLS/DOL.

<sup>4</sup> National Health Interview Survey conducted by NCHS/CDC.

<sup>5</sup> National Crime Victimization Survey conducted by BJS/DOJ.

X Data collected.

—Not applicable.

NSDDAB = National Survey of Distracted Driving Attitudes and Behavior; CES = Consumer Expenditure Survey;

NHIS = National Health Interview Survey; NCVS = National Crime Victimization Survey; HH = household.

Although demographic variables are essential for weighting data, not every variables is used. Variables are selected as needed when weighting the final dataset. For example, if the gender split in the data matches closely to that of the target population, gender alone may not be introduced in the weighting scheme; however, a crosstab of gender by age may be used.

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## Travel Behavior Capture Compared to Regional Surveys

The 2022 NHTS questionnaire shares many similarities with earlier NHTS iterations and regional travel surveys, meaning researchers and policymakers can expect similar data availability and consistent sampling frames between survey types. This allows for comparisons between survey results. Maintaining similar definitions allows researchers to easily compare modal and trip purpose splits between NHTS iterations.

Similar to regional travel surveys, the 2022 NHTS captures general household sociodemographic and detailed travel characteristics (e.g., household income, available household vehicles, household size/lifecycle, age, gender, education, ethnicity, and other pertinent sociodemographic information). The 2022 NHTS captures data on a respondent's entire travel day at the trip level (e.g., origin, destination, trip mode, trip purpose, travel party size/makeup, and trip duration). These common travel behavior elements are captured in many other travel surveys and commonly used travel survey smartphone applications such as the Resource Systems Group's rMove and Westat's DailyTravel.

The 2022 NHTS varies from regional travel surveys and previous NHTS iterations by asking specific and timely policy-based questions. As new modal trends and policy foci come to fruition, stakeholders and policymakers could use these travel surveys to gather the public's sentiment. For instance, questions pertaining to the impacts of the COVID-19 pandemic on respondent travel or details of recent long-distance travel may not be present in other travel surveys.

Another potential difference between the 2022 NHTS and regional travel surveys is the capture period. The 2022 NHTS captures detailed travel behavior for 1 day and general travel behavior (i.e., estimated monthly/weekly usage of transit, walking, and biking) from each respondent. Some regional surveys, especially those that rely on smartphone travel apps, may capture a respondent's travel for multiple days. This increased capture period can provide a more complete picture of a given household/respondent's travel behavior, but at a much higher administrative cost. Regional travel surveys may employ Global Positioning System (GPS)-based and/or in-vehicle tracking technology to capture travel behavior more accurately—methods not currently supported by a Federally funded survey.

### Long-Distance Travel

In addition to daily travel, the 2022 NHTS asks respondents to recall their most recent long-distance trip (i.e., one-way trips of 50 miles or more from the respondent's home address). The 2022 NHTS is the first time to specifically capture long-distance travel since the 2001 NHTS iteration. All respondents ages 5 years or older are asked to recall the number of long-distance trips—except daily commuting trips—they completed over the past 30 days from their assigned travel day. If a respondent indicates no long-distance travel, they are asked for the month and year of their last long-distance trip from within the past 5 years. Respondents can indicate if more than 5 years have passed since their last long-distance trip or if they have never completed a long-distance trip. Respondents are also asked to recall the number of nondaily commuting trips completed annually by Amtrak and/or inter-city bus service (e.g., Greyhound or Megabus).



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For respondents who indicate completing a long-distance trip in the past 30 days, details of their most recent long-distance trip are recorded in one of the following two ways:

- If the respondent records a long-distance trip during their travel day, their long-distance trip is flagged in the trip file.
- In the event of no long-distance travel on the assigned travel day, the respondent is asked to identify the month and year of their last long-distance trip. If that most recent long-distance trip is within 4 weeks of the respondent's assigned travel day, the respondent is asked to provide more details about the trip (e.g., destination, duration, purpose, party size, and mode).

Although this data collection effort provides a generalized overview of the long-distance travel habits of each respondent, the insights offered are limited. Echoing the 2001 NHTS User Guide's take on the subject—the last NHTS to capture long-distance travel—the 2022 NHTS should not be used to estimate a household/respondent's annual long-distance travel behavior or volume. Instead, the 2022 NHTS offers an annualized aggregate-level look into long-distance travel behavior at the national level.

### **State of the Practice: Survey Modes**

The 2022 NHTS relies on a push-to-web surveying approach with a paper survey option available to ABS-recruited respondents. Both survey modes consist of the same components: a household profile and a trip reporting component. Each household completes a single household profile, but the number of travel diaries is dependent on the number of household members ages 5 years or older. For example, in the case of a four-person household with one member being a newborn, the household would complete one household profile but only three travel diaries. The following details common survey mode best practices.

#### **Mail Push-to-Web at the Industry Level**

The survey industry has shifted away from random digit dialing (RDD) and embraced ABS for a variety of reasons, including the need for geographic strata within the sample—especially when the survey is statewide or nationwide. Phone number portability and the use of mobile phones makes it nearly impossible to determine telephone respondent location, whereas ABS provides nearly complete sample coverage for any geographic region of the United States. This switch in sample frame also precipitated a switch in survey mode. ABS frames have limited phone numbers associated with them, and these numbers are appended based on commercial transactions, which means they are not randomly paired throughout the sample. Mail is often the first contact made to ABS households because the address is the most solid piece of information on the sampled household.

A commonly used mode is mail push-to-web, which link respondents to online questionnaires that rely on programmatic skips and randomizations, something paper questionnaires have a limited ability to do effectively. For example, a skip pattern based

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on more than one previous question can prove problematic for the respondent of a paper questionnaire, whereas an online questionnaire presents the respondent with a seamless experience and can even prompt them when they enter information that the question does not ask for. Despite the growing popularity of mail push-to-web, the response from the sampled households still falls well below what would be needed to avoid conducting a nonresponse bias analysis.

### **Use of Smartphone Apps in Travel Surveys**

Apps that automatically track the location of the person carrying the smartphone are often used in regional and statewide household travel surveys. The advantages of smartphone apps as a data collection tool versus traditional diaries or online trip reporting include increased accuracy, lower reporting burden for the respondent, collection of multiple days of data, and the potential for increased trip rates. Because smartphone apps can track an individual's travel every few seconds with a high degree of specificity that can predict travel mode (e.g., walking, vehicle, train), the respondent does not have to maintain a travel log as long as they have their smartphone with them. This reduces respondent burden tremendously because most respondents nowadays would carry their phone with them regardless of whether the app was installed or not. Recall bias, which is often present in travel surveys, tends to favor trips at the beginning or end of the day, but trips in the middle of the day are often missed or mischaracterized. A smartphone app also alleviates respondent misunderstanding about the definition of a "trip." Respondents will often mistake two or more trips as one trip and record it as such. With less respondent burden, multiple days of data can be accumulated—as many as 7 days are used to establish an overview of a respondent's travel behavior. The invariability of smartphone apps leads to increased trip reporting compared to recall trip reporting.

Despite the myriad advantages, there are drawbacks to using smartphone apps in a travel survey. Older or younger household members who may not have their own smartphone will be excluded from the sample or asked to report their travel using an online survey instead. This may limit the households for which data can be collected on multiple days for all household members. For lower-income households, which often share a smartphone, the app may record and blend the travel of more than one individual because the device may be with one person in the morning and a different person in the afternoon, and there is no way to discern who is traveling based on the data retrieved from the app. These challenges lead researchers to offer alternatives to smartphone apps during data collection.

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## OMB and Smartphone Apps/Tracking Travel

As a Federal survey, the 2022 NHTS must conform to the Federal Paperwork Reduction Act and corresponding review and approval by OMB. To date, there have not been any Information Collection Requests (ICRs) approved by OMB, which include using a smartphone app or GPS device to track the travel patterns of the public. This is not to say that such a request would be denied; however, there is currently not a precedent for such a survey approach. Although smartphone apps and GPS loggers have been used for state and regional household travel surveys over the past decade, there is currently not a precedent for such a survey approach at the national level. Passive data collection devices, which do not track location, have been approved by OMB in the past. For example, in 2012, the National Health and Nutrition Examination Survey<sup>5</sup> included a Physical Activity Monitor (PAM) for use in a pilot study of participants 3 years and older in their ICR. The PAM measured only the physical activity and sleeping patterns of the participants and did not track location.

## State of the Practice: Recruitment Approaches

The 2022 NHTS has two initial recruitment paths unique to the sampling approach. For households sampled in the ABS and add-on studies, an initial invitation letter is mailed to the address. This letter encourages the household to partake in the survey either online or by requesting a paper survey. For the PFS study, households receive an email and online invitation. Nonrespondents are sent additional reminder postcards (ABS) or emails (PFS) to encourage participation.

For both ABS and PFS, once a household agrees to participate, the main household respondent completes the initial household profile component of the survey. Then all members of the household ages 16 years or older are invited to complete their own travel diaries. Household members ages 5 to 15 years have their travel diaries filled out by the main household respondent by proxy. The main respondent is encouraged to act as a proxy respondent when other household members fail to complete their trip reporting component. Partial respondents are sent additional reminder postcards or emails to encourage completion.

## Industry

When recruiting for a self-administered survey, the most popular mode of initial contact is mail. This approach often takes advantage of the USPS Delivery Sequence File and ensures, with pinpoint accuracy, coverage of the target population as defined by geography. The initial contact is typically a letter, rather than a postcard, sent to the household that contains information about the survey, the respondent's right to privacy, and instructions on how to complete the survey. The initial invitation letter should include, at a minimum, the following:

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<sup>5</sup> Supporting Statement, Request for Clearance. National Health and Nutrition Examination Survey. September 19, 2012. OMB No. 0920-NEW, p. 11.

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- Name of the survey sponsor.
  - Purpose of the data collection.
  - Information on the right to privacy.
  - Whether the data collection is mandatory or voluntary.
  - Login credentials to access the online questionnaire.
  - A telephone number to call to request a paper questionnaire.
  - A helpline to call if the respondent needs help completing the questionnaire.

Often, the invitation letter may include a quick response (QR) code that can be scanned by the respondent with their smartphone to take them directly to the survey. However, it is important to consider the questionnaire design when deciding whether to include a QR code. Although all online surveys should be optimized for mobile device use, including a QR code greatly increases the chances of the survey being accessed on a smartphone, which may not be ideal for highly complex questionnaire designs.

In 2016, the National Highway Traffic Safety Administration (NHTSA) Motor Vehicle Occupant Safety Survey<sup>6</sup> adopted ABS for the first time after conducting the survey via RDD for many iterations. Among the findings of a NHTSA-conducted pilot study to review best practices regarding ABS recruitment was that the response rate almost doubled when the surname associated with the sampled address was included on the mailing label (13.4 percent) as opposed to using “Respondent” as the addressee (7.3 percent). The 2022 NHTS addressed all mail to “Respondent.”

### **Other Travel Surveys**

To maximize response rate, travel surveys incorporate the recruitment methods for initial contact described above. Because these efforts seek to capture travel behavior in either a one- or two-stage approach, additional information needs to be provided either in the invitation letter or as a supplement. The North Florida Transportation Planning Organization recently fielded the North Florida Travel Survey<sup>7</sup>, which recruited the sample via mail and pushed them to the web. Although respondents were asked to record their travel behavior online, the trip reporting was based on recall, rather than having the respondents return at a later date to record their travel. Other travel surveys break the survey process into two stages, recruitment then a later return to report travel.

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<sup>6</sup> Bailly et al; accessed on November 1, 2022, at <https://rosap.nhtsa.gov/view/dot/43610>.

<sup>7</sup> FDOT Statewide Survey Colloquium, accessed on December 14, 2022 at [https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/planning/customers/household-travel-surveys-best-practices.pdf?sfvrsn=a93e6062\\_2](https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/planning/customers/household-travel-surveys-best-practices.pdf?sfvrsn=a93e6062_2).

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Due to the burden of travel surveys, it is important to word the invitation letter carefully. Most survey requests are straightforward and ask limited questions about a particular topic. A travel survey asks much more of the respondent, and the recall task can be inordinately burdensome for certain respondents. The invitation letter should be convincing and stress the importance of the study and, if relevant, highlight the benefits to the respondent—whether direct or indirect.

### **State of the Practice: Use of Incentives**

The 2022 NHTS uses a series of monetary incentives to encourage survey participation. For the ABS and add-on studies, an initial incentive of a \$2 bill is adhered to the invitation letter to encourage the potential survey respondent to enroll in the survey. Once the main respondent, who must be 18 years or older, completes the household profile component of the survey, they are entitled to a \$10 incentive check regardless of further survey action—as long as the respondent fills out the household survey section and provides a name, they will receive the \$10 incentive check. If a household consents to participate in the trip reporting component of the survey, the main respondent is entitled to an additional \$5 incentive for each household member who reports their travel. There is no cap on the incentives a household can earn. For example, if a household of four completes all required survey components (including all four travel diaries), they are entitled to an incentive amount of \$30 (i.e., \$10 for the household survey component plus \$5 for each person who reports their travel) in addition to the initial \$2 incentive received in the invitation letter.

Participants recruited through the PFS study are awarded cash-equivalent points that can be redeemed as either cash or other prizes through Ipsos KP. Respondents who complete the household profile section of the survey are entitled to the equivalent of \$2 in points as an incentive. Similar to the ABS and add-on studies, the main PFS respondent receives an additional \$5 equivalent in points as an incentive for each household member who reports their travel. There is no cap on incentives for completed diaries.

### **Incentives in Federal Surveys**

The use of respondent incentives in Federal surveys has evolved over time. It was not until 1995, with the implementation of the Paperwork Reduction Act, that respondent incentives were allowed for Federal data collection—although a strong justification was, and still is, needed for approval. Section 2.3.2.5 of the Standards and Guidelines for Statistical Surveys<sup>8</sup> issued by OMB states the following:

*Although incentives are not typically used in Federal surveys, agencies may consider use of respondent incentives if they believe incentives would be necessary to use for a particular survey in order to achieve data of sufficient quality for their intended use(s).*

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<sup>8</sup> [https://www.whitehouse.gov/wp-content/uploads/2021/04/standards\\_stat\\_surveys.pdf](https://www.whitehouse.gov/wp-content/uploads/2021/04/standards_stat_surveys.pdf).

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Although there are many examples of Federal surveys that use incentives to maximize response rate with the hope of reducing nonresponse bias, each such data collection effort must provide a detailed justification as to why incentives are necessary. In more recent guidance<sup>9</sup>, OMB laid out eight principles that agencies should use to justify the use of incentives, specifically: data quality; burden on the respondent; complex study design; past experience; improved coverage of specialized respondents, rare groups, or minority populations; reduced survey costs; equity; and research into the effects of incentives. Framing the justification of incentives with some or all these principles in mind will increase the likelihood that incentives will be approved by OMB for a given data collection effort.

### **General Use of Incentives in the Survey Industry**

Survey methodologists have used incentives to maximize response to data collection requests for more than 90 years (Shuttleworth, 1931). Amidst declining response rates to an ever-growing number of survey requests—estimated to be more than 110 million in the United States annually (Leeper, 2019)—incentives have become almost essential in ensuring responses are provided from a broad representation of respondents. The following are some of the numerous variables to consider when offering an incentive to a potential respondent:

- Fixed versus differential incentives: An incentive can be the same for all targeted groups or vary across groups—being higher for hard-to-reach populations or increasing in amount with each contact attempt.
- Contingent versus noncontingent incentives: Incentives can be provided before a survey response is received, after the response is recorded, or a combination of the two.
- Type of incentive offered: This can include cash, gift cards, token gifts, or online credit.
- Timing of the incentive: The incentive can be provided with the advance letter, first paper questionnaire mailing, or later in the contact process. This is similar to the contingent versus noncontingent incentive because there are various options to deliver the incentive both before and after a response is received.
- Amount of the incentive: Although this is important, there are other factors to consider that may increase response rates more than raising the amount offered to respondents.

Survey industry best practice is to offer cash with the first contact. Singer and Ye (2013) and Mercer et al (2015) found that sending cash along with the first contact raises the response rate compared to offering a promised incentive or no incentive. The cash amount does not need to be large—\$2 or \$5 will achieve the desired effect—and any amount more than \$5 offers only diminishing returns. Depending on the target sample size, cash incentives may be an expensive endeavor because a high percentage of contacts will be sent out without any response.

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<sup>9</sup> [https://www.whitehouse.gov/wp-content/uploads/legacy\\_drupal\\_files/omb/assets/OMB/inforeg/pmc\\_survey\\_guidance\\_2006.pdf](https://www.whitehouse.gov/wp-content/uploads/legacy_drupal_files/omb/assets/OMB/inforeg/pmc_survey_guidance_2006.pdf).

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## Key Takeaways

Researchers and practitioners anticipate the 2022 NHTS to yield rich insights into household travel patterns in this post-pandemic period. The questions provide a mix of traditional core details on the specifics of each trip made combined with insights into the impact of the COVID-19 pandemic on daily travel; recent long-distance travel; and use of emerging travel modes such as rideshare, e-scooter, and bikeshare programs.

The 2022 NHTS design elements comport to survey industry standards and many concurrent Federal surveys. The main point of differentiation from many regional travel surveys is the absence of a smartphone app, a survey technology for which there is no precedent of OMB approval.

The 2022 NHTS employs a novel parallel approach; it is the first in the United States to run parallel ABS and PFS surveys with the same sampling strata and targets. An independent evaluation will assess the differences in results between these two sampling types to assess the viability of potential cost savings and improved respondent experience associated with a PFS for future NHTS core data collection cycles.

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