



## Exploring New Directions for the National Household Travel Survey

### DETAILS

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0 pages | 8.5 x 11 | PAPERBACK

ISBN 978-0-309-43114-9 | DOI 10.17226/21938

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TRANSPORTATION RESEARCH  
**CIRCULAR**

Number E-C178

October 2013

**Exploring New Directions  
for the National Household  
Travel Survey**

*Phase One Report of Activities*

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TRANSPORTATION RESEARCH CIRCULAR E-C178

# **Exploring New Directions for the National Household Travel Survey**

## *Phase One Report of Activities*

*Prepared by*

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Stacey Bricka

*For the*

Task Force on Understanding New Directions for the National Household Travel Survey  
Transportation Research Board

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## TRANSPORTATION RESEARCH CIRCULAR E-C178

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### ACKNOWLEDGMENTS

The details contained in this document come from the National Household Travel Survey (NHTS) User Community, as presented in user forums and an online user survey. The user forums were facilitated by members of the TRB Task Force on Understanding New Directions for the NHTS, with the express goal of understanding users' experiences and obtaining input for the next NHTS user survey.

This document was copyedited by Michelle Benoit, TTI Communications.

## Preface

The National Household Travel Survey (NHTS), administered by the FHWA, provides a wealth of data on how households within the United States travel, giving professionals in transportation the tools they need to make policy and planning decisions. The Transportation Research Board (TRB) Task Force on Understanding New Directions for the NHTS was formed in the fall of 2011, with the scope of serving as a bridge between the NHTS data user community and the FHWA with respect to the design of the next NHTS, currently programmed for 2015. The purpose of this e-circular is to summarize the input received from the user community to date through discussions, presentations, and a listserv survey. Details of how to join the listserv can be found in the Appendix: NHTS User Listserv Subscription Instructions (see page 22). This report was prepared by Jean Daniel Saphores, Sarah Chesebro, Thera Black, and Stacey Bricka. The content of this e-circular is drawn from the discussions and survey results, and does not necessarily represent the views of all members of the task force, all survey respondents, or TRB. Support from the FHWA Office of Highway Policy Information enabled the task force's extensive outreach to current and potential NHTS data user communities and member participation in task force meetings.



## Overview and Summary

In Phase One of its charter, the Task Force on Understanding New Directions for the NHTS focused on the needs and experiences of technical users of the NHTS. This includes those who use the data for research, policy, and travel demand modeling, among others. The task force's main outreach activities have included committee presentations at the 91st and 92nd Annual Meeting of the Transportation Research Board, user forums at related events, and a user survey to identify user needs for the future NHTS.

The task force also established a listserv to communicate NHTS updates to the user community. The listserv is not very active yet; most communications are one way, with the task force posting FHWA NHTS program updates and details regarding TRB-related meetings on a quarterly basis. It was also used to invite listserv members to participate in a survey about their use of the NHTS. Among the main themes that emerged from Phase One of the task force activities are the following observations, based on the input received from members of the user community:

- Widespread need for the data and national trend analysis provided by the NHTS was evident in outreach activities.
- NHTS data are used for a variety of purposes by many different user groups; their needs differ widely.
- Expectations of what the NHTS should be often differ from its actual mission and purpose, which can lead to opinions that it falls short of delivering data some users would like.
- While the NHTS clearly fulfills its mission as a nationally representative survey of travel behavior, users are increasingly interested in statistically valid data from more detailed geographies, including state and metropolitan planning organization (MPO) geographies and rural areas.
- Satisfaction with the frequency of the NHTS depends on intended uses of the data.
- Many users would like the next NHTS to take advantage of technological advances in survey sampling and design [e.g., Global Positioning System (GPS) data]. However, others note that maintaining a phone-based survey sample would help maintain comparability with data from previous surveys.
- The NHTS provides extensive data. However, many users noted that they need help translating these data into useful information. While existing tools enable access to a wide array of NHTS data, some users would like additional tools to more easily create user-defined reports.
- Many potential users are not aware of the NHTS and how it can be used.
- Some users noted that the value of NHTS data could be increased with guidance on how to effectively fuse it with other standard datasets.

## Purpose and Mission of the NHTS Task Force

In September 2011, TRB organized a 3-year task force titled Understanding New Directions for the National Household Travel Survey. The scope of this task force is to

...organize sessions and workshops at TRB annual meetings and other TRB meetings to discuss proposed survey modifications and explore potential impacts on various transportation data user communities.

The main focus of the task force is to reach out to the transportation community regarding the use of NHTS data and potential impacts of the redesign of the survey, and to serve as a bridge between the U.S. Department of Transportation (DOT) and the NHTS data user community. The task force communicates updates, solicits input, and facilitates discussion. It neither advises nor makes recommendations.

The task force is comprised of 22 members from federal, state, and local agencies, as well as academic institutions and consulting firms from across the United States. Committee membership reflects the diversity of uses and users considered by the NHTS, ensuring representation of a robust range of perspectives. Membership as of August 2013 includes

1. Stacey Bricka, Texas A&M Transportation Institute (chair);
2. Krishnan Viswanathan, CDM Smith (secretary);
3. Lisa Aultman-Hall, University of Vermont;
4. Charles Baber, Baltimore Metropolitan Council;
5. Michael Baltes, Federal Transit Administration;
6. Thera Black, Thurston Regional Planning Council;
7. Daniel Chatman, University of California–Berkeley;
8. Sarah Chesebro, California Department of Transportation;
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11. Mark Freedman, Westat;
12. Karl Kim, University of Hawaii;
13. Nancy McGuckin, Travel Behavior Associates;
14. Phillip Mescher, Iowa DOT;
15. Don Pickrell, Volpe National Transportation Systems Center;
16. Steve Polzin, University of South Florida;
17. Guy Rousseau, Atlanta Regional Commission;
18. Adella Santos, FHWA;
19. Jean-Daniel Saphores, University of California–Irvine;
20. Joseph Schofer, Northwestern University;
21. Brian Tefft, AAA Foundation for Traffic Safety; and
22. Penelope Weinberger, AASHTO.

## Overview of Future NHTS Considerations

As of the date of this report, there are multiple planning considerations for the next administration of the NHTS, which is scheduled for 2015. To better understand the NHTS, it is useful to briefly review three aspects of the NHTS that are being considered for possible changes with the 2015 survey: survey content, survey methodology, and survey product resources available for users (i.e., datasets, tools, and personnel). The task force attention encompasses both the national sample funded by FHWA and the optional add-on component. The add-on component is an option that enables a municipality, MPO, region, state, or mega-region the ability to contract with FHWA for an additional sample within that geography. Conducting this as an extension or an add-on to the NHTS provides some economy of scale in terms of cost and logistics for the additional sample. Details of both the regular NHTS and the add-on component are under consideration.

In terms of content, FHWA is considering the types of data collected for different population groups, how the data are used, and emerging data analysis needs. As data and spatial analysis needs change, the agency recognizes that it is important to ensure that future survey designs accommodate where possible those changing needs, while simultaneously considering how potential changes in survey and question design may affect the ability to do trend analysis across historical data sets.

In conjunction with content, the FHWA NHTS program staff plan to continue to explore facets of survey methodology, such as sampling design, multiple data collection methods, and statistical estimation and weighting issues, as new research emerges from other national surveys in all relevant social science areas (not limited to travel). Given the trend toward cell-phone-only households and its implications for new sampling approaches, one of the major issues FHWA will address is how much of the national sample should be compatible with traditional telephone-based survey methods in order to ensure valid comparisons between the 2015 NHTS and previous surveys. The rest of the national sample could then be collected via new methods, such as using cell phones, GPS, web surveys (possibly using social media), or even mail.

Another major focus for FHWA is on gathering information on end products and survey uses by the user community. While generating data is an essential deliverable, understanding the nature of survey uses and data needs is also paramount. For example, in addition to producing national estimates, should statewide, regional, or metropolitan estimates on the non-add-on portion of the data be calculated? Does the NHTS program have the human resources needed to provide sufficient statistical consultation on issues important to policy makers? Do the tools available for analyzing and working with the data meet the needs of users? These are some of the issues on the planning agenda for the next NHTS, which the FHWA NHTS program is working to answer.

## International Perspective

### *Context of National Travel Surveys*

As part of the 91st Annual Meeting of TRB, the NHTS task force organized a session on national travel surveys. The objective of this session was to learn about national travel survey data programs in other countries. In particular, task force members asked the speakers to focus on:

- The objective in conducting the travel survey;
- What role data users play in the design of the survey; and
- Based on lessons learned, what recommendations they might have for the United States as U.S. DOT gears up for the next NHTS.

Session 483, National Travel Surveys in Transition: International Perspective, was held January 24, 2012, from 8:00 to 9:45 a.m. The session was well attended and included the following presentations:

- Activities in Canada, by Martin E.H. Lee-Gosselin of Laval University in Canada;
- Activities in Switzerland, by Kay W. Axhausen of the Swiss Federal Institute of Technology in Zurich;
- Activities in Germany, by Barbara Lenz, head of the Institute of Transportation Research in Germany;
- Harmonization of European Surveys, by Jimmy I. Armoogum of IFSTTARS, the French Institute of Science and Technology; and
- Discussion, by Alan E. Pisarski, consultant.

As of the date of this publication, Session 483 presentations are posted on the website of the TRB Committee on Travel Survey Methods (<http://travelsurveymethods.org/methods/pages/trb2012?locale=en-US>).

The following is a summary of the presentations, drawing from Alan Pisarski's presentation as discussant for the session.

1. Content:
  - a. Content is similar across the different surveys.
  - b. These surveys offer examples for the NHTS program to consider with regards to gathering long-distance travel data, obtaining more private vehicle activity detail, and documenting variations in travel over time.
2. Methods:
  - a. Periodicity is a challenge everywhere.
  - b. The advantages of a national register-like sampling frame are evident in the presentations of the European surveys.
  - c. We need to share our experiences on using emerging technologies because these technologies are likely going to play a key role in the future of these types of surveys.
3. Financial:

- a. Funding large-scale national surveys is a struggle.
  - b. Do we fail to make the policy case for better information? Would that make a difference for securing reliable funding?
4. Institutional:
- a. A key question is who leads the surveys? Should it be the federal government (or equivalent), cities, or states or regions?
  - b. Europe is considering a transnational survey. Should we consider a North American travel survey?
  - c. Designing a survey at the national level with add-ons has potential.
5. Policy needs:
- a. There is increasing demand for niche data: data for specific modes, specific purposes, and specific applications.
  - b. Data are needed for policy research in areas other than transportation (e.g., vehicle safety, environmental impacts, fuel use and efficiency, and sustainability).

In his presentation, Pisarski identified the following research needs:

- With surveys conducted approximately every 10 years, what is the decay rate of travel survey data?
- What is the value of data from these national travel surveys? Can we present a cost-benefit analysis of these data?

Pisarski also suggested that the framework used to review international efforts (organizing feedback by content, methods, finances, institutional considerations, and policy needs) may be useful for evaluating the NHTS and other comparable surveys.

## Investigation of the NHTS Within the Data User Community

A key activity of the task force was to obtain input from NHTS users with respect to the design of the next NHTS. Central to this was to develop an understanding about what aspects of the existing NHTS work well and what aspects fall short of expectations or can otherwise be improved. Working directly with NHTS users provided valuable input to this effort.

Task force members reached out to the NHTS user community via TRB events and other opportunities to connect with the people who use NHTS data for technical, policy, and planning purposes. NHTS data users come from a wide variety of backgrounds so task force members reached out through diverse channels. The majority of themes arose from these events and outreach efforts:

- TRB NHTS workshop, Using National Household Transportation Survey Data for Transportation Decision Making, June 6 and 7, 2011, at the Keck Center in Washington, D.C.;
- Fourth Conference on Innovations in Travel Modeling (ITM), April 30, 2012, in Tampa, Florida;
- North American Travel Monitoring Exposition and Conference (NATMEC), June 6, 2012, Dallas, Texas;
- MPO Planning and Processes Summer Meeting, July 8, 2012, Irvine, California;
- ProWalk ProBike Conference, September 10–13, 2012, Long Beach, California;
- 13th National Conference on Transportation Planning in Small and Medium-Sized Communities (Tools of the Trade Conference), September 12, 2012, Big Sky, Montana;
- 56th Association for the Advancement of Automotive Medicine (AAAM) Annual Conference, October 17, 2012, Seattle, Washington;
- International Forum on Traffic Records, October 29, 2012, Biloxi, Mississippi;
- Webinar with ADC10 members November 15, 2012;
- Workshop at 92nd Annual Meeting of the Transportation Research Board, January 13–17, 2013, Washington, D.C.;
- 14th TRB National Transportation Planning Applications Conference, May 5, 2013, Columbus, Ohio;
- Online survey of MPOs, DOTs, and listserv members, May–June 2013; and
- Joint workshop of ADC10 and AFB60, July 24, 2013, New Brunswick, New Jersey.

Task force members met with small groups and TRB committees, convened a workshop, and conducted a survey to probe key areas of investigation related to use of NHTS data.

## Primary Themes from NHTS User Outreach

As part of the first phase of the task force activities, the group identified six key areas to focus on user input. These included usage of the NHTS and how well the data meets the user's needs, additional data desired for the next NHTS, sampling needs (including underrepresented groups), and the frequency of data collection. Following are results of these inquiries summarized by general question topic.

### HOW NHTS DATA ARE USED

#### Describing and Analyzing Travel

This is a common use of NHTS data, and includes work focused on vehicle miles traveled (VMT), vehicle occupancy, trip generation, number of trips by mode, walking or biking, transit, urban–rural travel split, and commuting. It is used for research as well as policy and planning analysis. Task force members learned of many applications specific to rural travel and public transportation and walking or biking, as well as livability and walkability estimates. Other uses include developing and benchmarking trip rates; calculating average trip lengths; developing descriptive or benchmark statistics for travel; calculating peak period trip characteristics by city size; estimating trip production cross-classification models; quantifying how much travel is undertaken by gender, age, or drivers with different levels of experience; and determining willingness to relocate.

#### Energy Consumption, Environmental Concerns, and Household Vehicles

NHTS data are used for estimating energy consumption of household vehicles, calculating energy efficiency (miles per gallon), quantifying greenhouse gas formation, modeling air quality, estimating VMT by workplace location for sustainability projects, looking at vehicle start cycles, analyzing various aspects of vehicle ownership and use (including for hybrid electric vehicles), and exploring the relationship between changes in gas price and driving (given that the 2009 NHTS covered the gas price spike of the summer of 2008). NHTS data were also applied to study how well electric vehicle capacity meets daily travel needs.

#### Travel of Specific Demographic Groups

NHTS data support analyses of travel patterns (including constraints) of elderly and low-income populations and immigrant workers. It was noted that it is important to have data specific to immigrant travel patterns because this group represents a significant and continuing factor in U.S. population growth.

#### Innovative Ways to Present and Visualize Data

These methods were also discussed in several presentations and discussions.

## **Modeling and Planning Applications**

This is another central use of NHTS data and encompasses travel models (both four-step and activity-based models), studying the transportation–land use connections, and the impact of urban form on travel. Users described the work involved in adapting the NHTS database for use in travel models, and calibrating and validating models at the regional and state scales. Users explained ways in which they fuse NHTS data with the American Community Survey (ACS), the Census Transportation Planning Package (CTPP), and the decennial Census to better understand travel behavior, support travel demand model development, and assist with other statewide planning efforts. Another application dealt with studying parameters transferable through comparisons of estimates from local surveys with those generated via NHTS.

## **Safety**

NHTS data are used to support safety and public health planning through crash exposure analysis for better understanding of highway crash data, analysis of children’s travel to and from school in the context of the Safe Routes to School program, and estimation of risk exposure.

## **Long-Distance Travel**

NHTS data are used for analyzing long-distance travel trends and identifying factors that influence long-distance travel.

## **HOW WELL NHTS DATA MEET USER NEEDS**

Many users had very positive comments about the 2009 NHTS dataset, including that it is the only national source of key data for walking–biking, traveling to school, and understanding the characteristics of transit users. The data also allow analyses of interactions between land use and transportation. Several users noted that the NHTS is one of the better-administered surveys. They praised the ease of data access, the NHTS website, and the survey documentation and they liked that NHTS data are available in different formats. In addition, several users noted that some shortfalls of the NHTS were characteristic of household travel surveys in general. Despite these praises, though, users also identified several areas where the data did not meet their needs.

## **Modeling Applications**

Many of the issues mentioned relate to using NHTS data in travel demand or activity-based models. The most common comments were that the data included weekend travel days and that not all household members were interviewed (e.g., travel data by household members under the age of five were not collected). Most modeling applications are concerned with weekday travel only and by all members of the household regardless of age. Moreover, it was noted that there were inconsistencies in the data for joint trips by household members. Some participants also claimed that there were some mismatches between trip purpose and land use at trip destination. Current NHTS data have some gaps in meeting the needs of activity-based models.



A number of modelers providing input to the task force did not think that weekend and summer travel data were useful for their purposes. In addition, for understanding intra-household interactions, they had to impute the travel of household members under the age of five, and they found that data for “partially completed” households were not usable. Some modelers asked for weekday-only data and suggested that address-based sampling could give a more representative sample. They found it difficult to account for internal–external and external–internal trip ends, an important modeling input for MPO models; they wanted statewide survey data to help account for these.

Several modelers interested in safety analysis noted that the NHTS provides neither the characteristics nor the amount of travel of people who live in households with zero vehicles, which they saw as a severe limitation for their work. NHTS data also lacks information about driving experience, the type of license held, and the number of miles traveled annually and how it may have changed over time.

### **Single Day of Data Collection**

A number of users mentioned the need for more than 1 day of travel and more than 1 day of vehicle usage. Indeed, approximately 40% of household vehicles were not used on households’ assigned travel days.

### **Trip Chaining**

Some users thought that problems with NHTS data include missing start and end times, conflicting trip–activity chains, and unrealistic trip durations.

### **Transit Analysis**

It was noted that a more robust representation of transit is needed by many users.

### **Walk–Bike Analysis**

Few of the users in this investigation who plan for walking and biking use the NHTS data even though they understand the advantage the NHTS provides over Census data (Census covers only commute trips). NHTS data appear to have major deficits that render it insufficient for bike or pedestrian planning purposes, including a sample size that some identified as inadequate for many types of analyses.

### **Rural Travel**

The task force heard that a larger rural subsample is needed if NHTS data are to be more widely used for rural travel analysis. Some users claimed that NHTS data were not usable to understand rural travel in very small communities.

## **Representativeness of Sample**

The 2009 NHTS oversampled the elderly and did not include cell phone–only households, which caused concerns for some users. Some felt that this may have resulted in a skewed sample. Many first-time users of NHTS data did not anticipate these survey design elements and were disappointed by the perceived smaller sample size. Moreover, some high-risk groups (from the point of view of traffic safety) may have been overlooked in the sampling plan. Some users also raised questions about how the economic downturn may have affected travel behavior reflected in the 2009 NHTS.

## **Quality of Passenger Data**

Some traffic safety researchers expressed concerns about the quality and the coverage of passenger data.

## **ADDITIONAL DATA DESIRED FOR THE NEXT NHTS**

Building off questions about how well NHTS data meet user needs, the task force queried users to identify additional data that could enhance the next NHTS.

Users identified a broad range of topics encompassing data collection, survey methods, access to and documentation of the data, survey content, sampling and education and marketing. Some users noted substantial advances in sampling and survey design since the inception of the NHTS that could benefit the next survey.

## **Survey Data Collection**

Several users asked for complete surveys of all household members. Others requested keeping the core survey while introducing modules (e.g., smaller surveys focused on willingness to pay or in-home activities). Users also asked for vehicle trip length and cost of travel. Some users expressed interest in health-related travel behavior or in specific groups that the safety community typically focuses on, such as those with disabilities, teen drivers, seniors, cell phone users, and high-risk drivers. Some participants would like the NHTS to better capture nonmotorized trips and transit use.

## **Survey Methods and Design**

Numerous users suggested using GPS for data collection and web-based survey design. Using GPS would allow, for example, collecting travel data (including travel speeds) by roadway type and for conditions of special interest. Other requests included focusing more on small and medium-sized communities. Users were interested in examining relationships between active travel modes (bicycling and walking) and transportation infrastructure (e.g., bike lanes), which require more geographic detail. GPS technology was suggested as one possible solution. For both pedestrian and bicycle trips, improved geocoding was desired for the trips ends and home locations (this would presumably be beneficial for all modes). Providing more disaggregated locations is desired, as is the ability to capture local–regional differences. To improve the

accuracy of data collection, it was suggested that a smartphone application be created that could capture trip start and end times, as well as locations. The importance of distinguishing between actual stops and vehicular stops was also noted.

Some users raised concerns about the phone-based approach to the survey. Some believe this survey approach will not continue to serve planning needs. Finding people in rural areas, especially with the increase in cell phone–only households, is difficult. However, some users noted that maintaining a phone-based survey may provide better compatibility with previous surveys and ensure comparability with historical NHTS datasets.

### **Data Access**

Some users suggested that providing more user-friendly tools would improve access to the data. Several people mentioned difficulties with the online Table Design function. Others asked for flags in the data for joint household activities, which is useful for activity-based modeling. There were also suggestions to provide NHTS data in other formats such as XML or to export NHTS data to portable tablets.

### **Survey Documentation**

There were several requests for more documentation of variables, particularly for derived variables.

### **Using NHTS with Other Data Sources**

Some users asked for guidance on merging or augmenting the NHTS with other data sources, particularly commonly used data sources such as the Highway Performance Monitoring System, ACS, and U.S Energy Information Administration data. In addition, there were requests for guidance on how to use NHTS data to augment regular household travel survey data to stretch local resources a little further. Others asked about including spatial data in the NHTS to facilitate its use with geographic information system data to allow mapping and spatial analysis. It was suggested that tools for making data transferable from the national level to smaller scales may help address these needs.

### **Add-On Participation**

It was suggested that the NHTS could make it easier to participate in the add-on component of the survey.

### **More Than 1 Day of Travel or Vehicle Use**

As mentioned above, many users requested more than 1 day of vehicle use data, for example, for studying electric vehicle use and energy consumption. Having data for only 1 day of travel was also identified as insufficient for analyzing extreme commutes. The collection of 1 day of travel and the lack of knowledge about whether a day was typical have significant impact on nonmotorized modes because they represent relatively fewer observations.

## **Walk–Bike Trips**

The NHTS collected stand-alone walk trips and walk access to–egress from transit. The former were counted as trips and the latter were counted as part of a trip chain. User guidance was requested on how to combine them to estimate total walking. Additional types of walking trips were raised as potentially important. These included walking from a parking lot to a destination, indoor walking, better coverage of walking during tours, and walking between transit stops. There was also interest in pedestrian behavior under different lighting conditions. The NHTS online tool appears to create some problems for users seeking detailed data on trip distances traveled by biking or walking, particularly for short trips. Better data in general was suggested for average trip length by trip purpose for both bike and pedestrian trips.

## **Travel Speeds**

Several users requested more comprehensive editing of trip speeds, which were developed by combining data on trip distance and travel time.

## **Attitudinal Questions**

Some users requested more comprehensive attitudinal questions (e.g., about traffic characteristics or active modes). Some also suggested asking questions about special events during the course of the survey to measure the impact of nonrecurring incidents or events. Others asked for more information from Claritas.

## **Cost Information**

Some NHTS users suggested asking questions about travel cost for different modes and transit in particular to better understand modal shifts.

## **Urban–Rural Coding**

To improve urban–rural coding, it was suggested that the NHTS adopt the Department of Agriculture coding scheme (Rural Urban Commuting Areas).

## **Long-Distance Travel**

The task force heard extensive discussion about the need for and possible specifications of a future long-distance travel survey. This was discussed at length at the TRB NHTS Workshop (June 2011). In the context of long-distance travel, weekend and summer data were most desired. Some users also requested more data on cross-border work travel (interstate and cross-border trips) and “super commuters” who make very long commutes. Moreover, there was a sense that biking and walking play a role in the overall long-distance travel patterns that is not reflected in the NHTS data.

## Postprocessing of Data

Several users commented that the documentation regarding weighting was overly complex and could be more helpful in knowing when and how to apply weights, for example, when analyzing a subset of the data for weekday typical travel only. Better and earlier documentation for weighting would have helped, especially in using replicate weights to generate standard errors.

## Deletion of Data Elements

Input was received regarding deletion of stated preference elements, weekend and holiday travel day data, immigrant status, and perceptions about transport systems.

## Education and Marketing

A number of suggestions were received to enhance the usability of the NHTS data. They include:

- Create e-learning modules (similar to what is available with CTPP).
- Provide tutorials for staff on topics ranging from how to open files to how to turn data into model inputs.
- Enhance user-defined reports.
- Post case studies: in particular, there were requests for case studies that use NHTS data creatively, especially for harder-to-quantify topics such as livability and sustainability.
- Explain how to properly use data, both for add-ons and for general users. Many agencies do not have the resources to train staff on how to use NHTS data.
- Provide user training and support in conjunction with CTPP training sessions.
- Develop general education modules for NHTS data. Possibilities identified included creating a student-focused competition and working with faculty to develop class projects and project-specific datasets that could be used to train the future workforce.
- Provide better outreach to MPOs including a timetable for the next add-ons. In particular, it should tell agencies how to participate in add-ons and how much that participation would cost.
- Explain how NHTS is working to overcome the generation gap posed by cell phone use among young people.
- Investigate transferability, including when it is not appropriate. A synthesis of the research conducted in this area was suggested. Users also asked for rules on how to borrow data from other regions, for example data relating to density and the built environment, employment by type, and, more generally, missing demographic, economic, or physical factors.
- Develop a methodology for using the data for very small area models.

## ADDITIONAL DATA NEEDS AND QUESTIONS RELATED TO CONTENT

NHTS data are used for a wide range of purposes by many different user groups with different needs. In many cases, expectations of what the NHTS should be or offer differ from its actual purpose. This part of the task force investigation was intended to identify other potential uses that NHTS data may be able to satisfy.

## **Meeting Legislative Compliance**

Some users asked how the NHTS can help meet legislative compliance as part of the Moving Ahead for Progress in the 21st Century Act. A follow-up was suggested to elicit details on the different regional and state policy directions that are underway for some brainstorming on how to use the NHTS to help provide evidence for policy makers and monitor performance measures for specific regional initiatives.

## **Performance Measures**

A need for data at the MPO level was noted by some users to develop performance measures and obtain information on changes in travel behavior following an improvement. For example, what effect do changes in speed limits or transit-oriented development have on travel behavior in regions, cities, or neighborhoods? Answering this question may require a continuous survey and more samples at smaller scales. In addition, some users would like data on satisfaction with transit service.

## **Vehicle Users**

Safety analysis modelers requested more comprehensive data about all vehicle occupants for each vehicle trip including age, gender, seating position, use of seatbelts, driver experience, type of license held, and annual miles driven. For older drivers, they would like to know about changes in driving habits related to the number of miles driven and driving conditions and why these changes took place. For children, they sought information about the use of safety seats and restraints. In addition, a number of users emphasized the need to track what vehicles are used by what household members.

## **Household Vehicles**

Several users requested fuel purchase data (e.g., a fuel purchase diary) and multiple odometer readings for each household vehicle. A subsample of vehicle identification numbers was sought, as was the duration the vehicle was owned over the full survey period. More information on low-emission vehicles was also deemed useful. Moreover, it was noted that vehicles need to be better identified, possibly including transmission and engine options, and more generally, to uniquely identify each vehicle make, model, and trim. Some users also asked for information about car sharing and telecommuting.

## **Mode Choice**

Some noted that it would be helpful to include the availability and cost of other modes (other than the mode respondents used), as well as measures of transit accessibility, parking costs, and tolls. It would also be useful to include options available for multimodal travel.

### **Impact of Communications Technology**

It was noted that for policy purposes, it is important to know how advances in communications technology are influencing travel. This includes smartphone ownership and usage, as well as how travel information is used. Likewise, it would be useful to know the travel impact of Internet use. For safety analysis, it would be useful to know the frequency and characteristic of use of advanced vehicle technology for navigation, information, and crash avoidance.

### **Low-Income Households**

Some users requested measures of job accessibility although these could be constructed if NHTS data had a sufficient geographic component.

### **Country of Origin for Immigrants**

Users who study immigrant travel asked to restore the country of origin question that was on the 2001 NHTS but was dropped for the 2009 NHTS. They believe this is crucial for studying immigrant travel since most of the projected urban growth over the next decades will likely be the result of immigration.

### **Walking–Biking**

Several users requested questions that get at the reasons why people do or do not walk or bike. Users were interested in obtaining additional types of attitude information such as whether transportation and travel desires dictated home location choice and quality of service for biking and walking trips. Having a standard list of questions focusing on bicycling and walking that add-on areas could easily opt into was suggested. Some users expressed a desire for better access to the add-on data. It was noted that the bicycle and pedestrian community may be useful in helping convince states and regions to fund add-on surveys if they generate sufficient data for bicycle and pedestrian planning.

### **Nontravelers**

Respondents who did not report a trip on their assigned travel day were asked when they took their most recent trip. Some users asked that this question be retained because it is an important indicator for studying immobility among the elderly.

### **Interregional Travel**

More data on inter-regional travel was noted by some users as desirable.

### **Transportation Demand Management**

Some users asked for more information on willingness to move travel to non-peak times, and data on workplace flexibility and usage of toll roads.

## **Electric Infrastructure**

Some users asked for information about the availability of electric vehicle charging stations at trip ends.

## **Parking**

It was noted that data on parking supply and parking costs would be useful.

## **Public Health**

Several users suggested collecting data to better link public health and transportation. Well-formulated questions could also yield data useful in areas beyond travel demand forecasting such as for the energy, environment, and transportation nexus.

## **Intermodal Travel**

Some users requested data for better understanding access and egress to transit, airports, and train stations.

## **Safety-Specific Issues**

Users of traffic safety data expressed interest in data about hours of sleep before driving to better understand fatigue-related crashes. There was also a request for better integrating NHTS data with longitudinal Census data, or with data from studies on naturalistic driving. In addition, there was interest in studying the risk exposures of young drivers, rural drivers, and motorcyclists; links between traffic safety and gender, and the safety impacts of vehicle type and even trip purpose. Despite a lack of interest in weekend driving data by many modelers, there is interest in weekend driving data for safety analysis.

## **Understanding Attitudes**

Several commented on the need for data about attitudes of all respondents (e.g., regarding traffic characteristics, the transportation infrastructure, or the weather as it relates to transportation), not just those who had walked or bicycled as was done previously. It was suggested that general environmental attitudes, possibly captured by the new ecological paradigm, may be useful.

## **GPS Data**

Several users requested the collection of GPS data for both motorized and nonmotorized modes. Others suggested taking advantage of smartphone technologies to gather GPS information. An important issue that needs to be considered is the frequency of GPS data collection because estimating emissions from motor vehicles requires relatively high-frequency data (approximately second-by-second data), whereas simply tracking location is not as demanding. Privacy was mentioned as a possible concern, but it does not seem to be a major issue among the data users.



## Miscellaneous

Some participants suggested allowing content-based add-ons in addition to the current geography-based add-ons.

## SAMPLING AND UNDERREPRESENTED POPULATION GROUPS

While the NHTS is intended to collect data on travel behavior at the national level, users are increasingly interested in statistically representative data for various subgroups of Americans, for more detailed geographies at the state or MPO level, and for better understanding travel in rural areas.

### Sample Size

Several users made general statements in support of increasing sample size. Alternatively, it was suggested that the NHTS might benefit from using rotating panels, rather than a large cross-sectional survey.

### Statewide Estimates

Some users requested that the sample size be large enough to allow for statewide estimates of common indicators in non-add-on states.

### Sample Representativeness—Sampling Subgroups

Several user groups would like larger samples of several population subgroups such as large households, nonwhite respondents, lower-income households, higher-income households, zero-vehicle households, and households with teen drivers. There was also a request to sample more tribal members to better understand tribal travel behavior. In addition, it was suggested that the NHTS should be conducted in languages other than English and Spanish to capture the travel behavior of special groups (e.g., the Hmong–Laotian population in Minnesota).

More representative samples of pedestrian and bicycle trips were also requested.

According to the feedback received by the task force, the number of bicycle trips recorded is so low as to preclude almost any analysis. Although there are more data on walking, the geographic details for both types of trips were deemed to be too aggregated to be useful. Some users suggested oversampling households with bicycle trips either nationally or within a diverse sample of communities.

Some participants were interested in the walking and biking travel of tourists, homeless residents, very low-income households, the disabled, seasonal residents, and transient populations. They were concerned that the 2009 sampling scheme did not cover these populations well and that information about children and youth might be less accurate than about others.

In addition, there was substantial interest in harmonizing national data from the NHTS with regional datasets.

### **Rural Areas**

Several users requested an oversampling of rural areas. It was noted that this is particularly needed where there is a large urban center in a nearby state.

### **Hispanic Respondents**

Some users asked for a larger sample of Hispanic respondents.

### **Hard-to-Reach Groups**

These groups include minorities, youth, very poor people (partly because of environmental justice considerations), and very wealthy people.

### **Age of Respondents**

Some users requested a more representative sample of the population by age.

### **Cell Phone–Only Households**

Some users suggested that the NHTS include cell phone–only households in its next iteration.

### **Transit Users**

There were suggestions to oversample areas with higher transit use to obtain a more representative sample of transit users.

### **Higher-Risk Drivers**

This includes teen drivers, some minorities, some elderly or disabled people, cell phone users, and people with suspended licenses and driving-under-the-influence citations.

## **SURVEY FREQUENCY**

Timeliness of the data is an important issue for many NHTS data users. This is particularly relevant for administering various programs and for making policy decisions. “Decisions will not wait for perfect data” is a recent quote from a conference chairman summarizing a discussion in an opening session. Satisfaction with the frequency of the NHTS partly depends on the intended uses of the data and varies widely among the data users.

Many participants believe that a 5- to 7-year survey cycle is not frequent enough; some suggested collecting key variables annually between surveys. Some users asked for conducting the survey continuously, noting that an advantage of collecting data continuously is that it would reduce the impact of unforeseen events. Others suggested every year or at least every 3 years would be appropriate. Still others suggested a survey every 5 years would be sufficient.

Finally, a number of participants strongly expressed the need to have more frequent surveys at well-known, fixed dates. This would be especially useful to states and MPOs, and would enhance the ability to budget the additional costs associated with add-ons.

## Phase One Summary

Task force outreach to the NHTS data user community during this first phase of activities revealed a number of recurring observations from members of that community:

- Widespread need for the data and national trend analysis provided by the NHTS were evident in outreach activities.
- NHTS data are used for a variety of purposes by many different user groups; their needs differ widely.
  - Expectations of what the NHTS should be often differ from its actual mission and purpose, which can lead to opinions that it falls short of delivering data some users would like.
  - While the NHTS clearly fulfills its mission as a nationally representative survey of travel behavior, users are increasingly interested in statistically valid data from more detailed geographies, including state and MPO geographies and rural areas.
  - Satisfaction with the frequency of the NHTS depends on intended uses of the data.
  - Many users would like the next NHTS to take advantage of technological advances in survey sampling and design (e.g., GPS data). However, others note that maintaining a phone-based survey sample would help maintain comparability with data from previous surveys.
  - The NHTS provides extensive data. However, many users noted that they need help translating these data into useful information. While existing tools enable access to a wide array of NHTS data, some users would like additional tools to more easily create user-defined reports.
  - Many potential users are not aware of the NHTS and how it can be used.
  - Some users noted that the value of NHTS data could be increased with guidance on how to effectively fuse it with other standard datasets.

These observations, along with the extensive detailed findings generated by the many users engaged by the task force, provide a rich repository of considerations to be weighed during the next phase of work, when other factors and constraints will be addressed.

## APPENDIX

### **NHTS–USER Listserve Subscription Instructions**

**T**o join the list, send an e-mail to [listserv@listserv.tamu.edu](mailto:listserv@listserv.tamu.edu) and in the body type “SUBSCRIBE NHTS–USER first name last name” (for example: SUBSCRIBE NHTS–USER Stacey Bricka).

You will receive an e-mail requesting confirmation—please watch for the e-mail and respond promptly, as you have a limited time window in which to confirm.

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