FHWA Research and Technology Evaluation

National Household Travel Survey Program

Final Report
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Foreword

The Federal Highway Administration (FHWA) Research and Technology Program furthers the FHWA's Office of Research, Development, and Technology's (RD&T) goal of ensuring transparency, accessibility, and responsiveness of RD&T for all stakeholders.

This report examines outcomes associated with the National Household Travel Survey (NHTS) program, namely (1) the extent of NHTS survey usage; (2) the impact of the NHTS Program on policy, project, and regulatory decisionmaking; and (3) the responsiveness of the NHTS Program to its user community.

This report should be of interest to FHWA staff, the NHTS user community, and transportation professionals involved in travel behavior modeling, survey research, and evaluation.

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Associate Administrator
Research, Development, and Technology (RD&T)

Notice

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16. Abstract This evaluation of the NHTS Program addresses three key questions: 1) What is the breadth and depth of NHTS usage? 2) What impact does the NHTS Program have on policy, project, or regulatory decisionmaking? 3) How responsive is the NHTS Program to its user community? Although it is difficult to trace the specific impacts of the NHTS data, the evaluation found many examples demonstrating that NHTS data inform a range of policy and legislative decisions, both within transportation and in other fields (e.g., health, energy). In some cases, NHTS provides context and understanding for how, when, and why Americans travel, as well as trends in travel. This context helps make the case for particular policy or legislative initiatives. In other cases, NHTS is an important data input to a model or statistical analysis, which is used, in turn, to influence policy or legislation. At the State and local levels, NHTS has its greatest impact in developing, calibrating, or validating travel demand models that are used to inform transportation planning and project selection. The report also identifies challenges and lessons learned regarding survey planning, survey administration, and outreach and offers a set of recommendations to improve program effectiveness.			
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SI* (MODERN METRIC) CONVERSION FACTORS				
APPROXIMATE CONVERSIONS TO SI UNITS				
Symbol	**When You Know**	**Multiply By**	**To Find**	**Symbol**
		LENGTH		
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
		AREA		
in^2	square inches	645.2	square millimeters	mm^2
ft^2	square feet	0.093	square meters	m^2
yd^2	square yard	0.836	square meters	m^2
ac	acres	0.405	hectares	ha
mi^2	square miles	2.59	square kilometers	km^2
		VOLUME		
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.785	liters	L
ft^3	cubic feet	0.028	cubic meters	m^3
yd^3	cubic yards	0.765	cubic meters	m^3
	NOTE: volumes greater than 1000 L shall be shown in m^3			
		MASS		
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lb)	0.907	megagrams (or "metric ton")	Mg (or "t")
oz	ounces	28.35	grams	g
		TEMPERATURE (exact degrees)		
°F	Fahrenheit	5 (F-32)/9 or (F-32)/1.8	Celsius	°C
		ILLUMINATION		
fc	foot-candles	10.76	lux	lx
fl	foot-Lamberts	3.426	candela/m^2	cd/m^2
		FORCE and PRESSURE or STRESS		
lbf	poundforce	4.45	newtons	N
lbf/in^2	poundforce per square inch	6.89	kilopascals	kPa
APPROXIMATE CONVERSIONS FROM SI UNITS				
Symbol	**When You Know**	**Multiply By**	**To Find**	**Symbol**
		LENGTH		
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
m	meters	1.09	yards	yd
km	kilometers	0.621	miles	mi
		AREA		
mm^2	square millimeters	0.0016	square inches	in^2
m^2	square meters	10.764	square feet	ft^2
m^2	square meters	1.195	square yards	yd^2
ha	hectares	2.47	acres	ac
km^2	square kilometers	0.386	square miles	mi^2
		VOLUME		
mL	milliliters	0.034	fluid ounces	fl oz
L	liters	0.264	gallons	gal
m^3	cubic meters	35.314	cubic feet	ft^3
m^3	cubic meters	1.307	cubic yards	yd^3
mL	milliliters	0.034	fluid ounces	fl oz
		MASS		
g	grams	0.035	ounces	oz
kg	kilograms	2.202	pounds	lb
Mg (or "t")	megagrams (or "metric ton")	1.103	short tons (2000 lb)	T
g	grams	0.035	ounces	oz
		TEMPERATURE (exact degrees)		
°C	Celsius	1.8C+32	Fahrenheit	°F
		ILLUMINATION		
lx	lux	0.0929	foot-candles	fc
cd/m^2	candela/m^2	0.2919	foot-Lamberts	fl
		FORCE and PRESSURE or STRESS		
N	newtons	0.225	poundforce	lbf
kPa	Kilopascals	0.145	poundforce per square inch	lbf/in^2

*SI is the symbol for the International System of Units. Appropriate rounding should be made to comply with Section 4 of ASTM E380. (Revised March 2003)

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List of Abbreviations

Abbreviation	Term
AARP	American Association of Retired People
AASHTO	American Association of State Highway and Transportation Officials
AAATSF	American Automobile Association Traffic Safety Foundation
CAFE	Corporate Average Fuel Economy
CDC	Centers for Disease Control
EIA	Energy Information Administration
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
ITS	Intelligent Transportation Systems
MOE	measure of effectiveness
MOVES	Motor Vehicle Emissions Simulator
MPO	metropolitan planning organization
NCHRP	National Cooperative Highway Research Program
NHTS	National Household Travel Survey
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
OHPI	Office of Highway Policy Information
ORNL	Oak Ridge National Laboratory
R&T	research and technology
TRB	Transportation Research Board
USDOT	United States Department of Transportation
VMT	vehicle miles traveled

Executive Summary

Purpose of the Evaluation

The National Household Travel Survey (NHTS) Program, funded by the Federal Highway Administration (FHWA) through the Office of Highway Policy Information (OHPI), is one of the programs being evaluated under FHWA's Research and Technology (R&T) Evaluation Program. Given the massive scale of this data collection effort—a yearlong survey that reaches 150,000 households—and the associated costs of collecting these data, FHWA wanted to better understand the longer-term impacts of the program.

Program Description

FHWA has conducted national travel surveys for more than 45 years. The surveys are conducted periodically (generally once every 6–8 years) and provide the only data in the country that link individual personal travel behavior, household demographic and socioeconomic characteristics, traveler attitudes, vehicle ownership, and vehicle attributes. In addition to the national sample, States and metropolitan planning organizations (MPOs) may purchase an additional, or "Add-on" sample. The 2009 NHTS consisted of a national sample of 25,000 households and an Add-on sample of 125,000 households. Currently, NHTS is planning its upcoming 2016 survey.

Methodology

The Volpe team identified four impact areas that comprise the Evaluation, each summarized as follows:

- ***Breadth and Depth of NHTS Use:*** explores who uses the NHTS, what type and form of NHTS data they are using, and for what purposes they are using NHTS data (e.g., travel behavior research, health related research, energy, etc.).
- ***Impacts on Policy, Project, or Regulatory Decisionmaking:*** demonstrate how NHTS data and outputs inform decisionmaking with respect to policies, legislation, and projects.
- ***NHTS Responsiveness to its User Community:*** assesses the ways in which NHTS solicits feedback from its user community, the frequency of its outreach, and a qualitative assessment of the changes that the NHTS Program has made in response to user feedback.
- ***Challenges and Lessons Learned:*** is a compilation of the challenges and lessons learned in conducting the NHTS surveys. Issues or topics that may serve as obstacles in the planning, administration, and outreach of the NHTS surveys are highlighted.

For each impact area, evaluation questions were developed along with key performance measures. The data collection was primarily qualitative in nature, including a literature search, document review, and indepth interviews. Quantitative data were only used in measuring the breadth and depth of NHTS use, including NHTS website usage statistics (http://nhts.ornl.gov/) and an analysis of the 2014 *NHTS Compendium of Uses*, an annual compilation of publications that cite the NHTS.[1]

Findings

Breadth and Depth of Use

An analysis of the 2014 *NHTS Compendium of Uses* demonstrates that 46 percent of publications are primarily transportation focused, but more than half of publications have a primary application in other fields that are connected to transportation, including energy (25 percent), survey methods or analysis (12 percent), environment (9 percent) and health (8 percent). Across fields, 45 percent of publications pertain to national level analysis, 30 percent are international, and 25 percent deal with State or regional issues or topics.(1) Across the different fields, the publications address a variety of transportation topics, and, in most cases, multiple topics are covered in a single publication.

The *NHTS Compendium of Uses* were analyzed from 2011 through 2014.(1–4) During this period, Volpe found that the number of citations increased from 210 to 313, and the citations with a primary focus in fields that are connected to transportation (e.g., health, environment, energy, and methods) grew significantly, from 28 to 44 percent of all publications.

Two sources of data were used to identify the NHTS users: the 2014 *NHTS Compendium of Uses* and a compilation of lead presenters at NHTS-sponsored conferences, workshops, or Transportation Research Board (TRB) sessions.(1) In the Compendium, Volpe found that a large majority of the publications are produced by academics (82 percent); however, the lead presenters' analysis demonstrated a greater mix of NHTS users, as 41 percent are comprised of academics, 27 percent are Federal, 22 percent are contractors or consultants, and 7 percent are MPOs. It should be noted that these findings on lead authors provide only a snapshot of users based on two distinct data sources. Through documents and interviews analyzed below, Volpe learned that NHTS users (both within and outside of Government) are regularly developing documents, reports, models, statistics, and other outputs that are not published or publicly distributed and hence are not included in these analyses.

Website usage statistics[1] offer another snapshot of NHTS use. From July 2013 through May 2015, the statistics indicate robust usage, with 8,443 visits to the website and 4,225 unique visitors in May 2015. NHTS Publication (PDF) views and tool activations seem to be driving visits in this period.(5)

Impacts on Policy, Project, or Regulatory Decisionmaking

NHTS clearly informs decisionmaking, but it is difficult to identify all impact cases, as policy proceedings and legislative hearings are not often transcribed and/or readily available, and oftentimes, the data sources (e.g., NHTS) for policies and legislation are not formally cited. As a number of interviewees explained, it is difficult to trace the decision output(s) of the NHTS, but it plays a critical role in providing context and an understanding of the travel behavior landscape, thus laying the foundation for decisionmaking. Through the interviews and document review, Volpe was able to identify several examples or cases that demonstrate the role of NHTS in the decisionmaking process.

[1]Website statistics are available from internal FHWA reporting systems.

At the Federal level, NHTS informs the writing of U.S. Department of Transportation (USDOT) reports and initiatives, the development of legislation (particularly during re-authorization), and the creation of Federal regulations. A recent example includes USDOT Secretary Foxx's *Beyond Traffic: Trends and Choices,* where NHTS data are informing the national dialogue on the state of and future direction of transportation.(6)

With respect to legislative uses, Volpe found that NHTS data are cited extensively in the *2013 Status of the Nation*'s *Highways, Bridges, and Transit: Conditions & Performance*, a Congressionally-mandated document that reports on the effects of past Federal surface transportation funding and authorization bills and informed future bills related to the surface transportation program.(7) NHTS data were also used in a series of reports produced by The National Surface Transportation Policy and Revenue Study Commission, created by Congress in 2005 under the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), to inform future reauthorizations.(8)

Other NHTS uses related to legislation involve advocacy groups and non-profit organizations. For example, the American Association of Retired People (AARP) and the American Association of Automobiles Foundation for Traffic Safety (AAAFTS), often use NHTS data in their reports and presentations to increase awareness about priority topics and to lobby Congress for action. Furthermore, with respect to regulatory uses, NHTS data are integral to the calculation of the model year Corporate Average Fuel Economy (CAFE) standards, which are regulations issued by the National Highway Traffic Safety Administration.(9–10)

In addition, NHTS informs policy and initiatives in other fields, including health and energy. Data on bicycling and walking have been used by the Centers for Disease Control (CDC) in its 10-year agenda, *Healthy People 2020* and most recently in the *Step it Up! The Surgeon General's Call to Action to Promote Walking and Walkable Communities.*(11–12) The Energy Information Administration (EIA) relies on NHTS derived vehicle miles traveled (VMT) and household vehicle data**,** combined with other data from the EIA and the Environmental Protection Agency (EPA)[2] to derive vehicle fuel consumption and vehicle fuel expenditures. These statistics are used extensively by policy and decisionmakers to understand economic and environmental impacts of changing travel demand.

States and MPOs use the data for a range of purposes. In most cases, NHTS trip data are used to develop, calibrate, or validate State and MPO travel demand models.[3] Interviewees indicated that these models are critical to transportation planning and inform corridor level, interchange, and transit projects, among others. In addition, States and MPOs that are required to produce air quality reports (because of their status as a non-attainment area) use NHTS data as an input to their models.

[2]Refer to section Use of NHTS in Policymaking in nontransportation Fields.
[3]Refer to section State and Local Transportation Policy and Planning.

NHTS Responsiveness to its User Community

The Volpe qualitative analysis found that NHTS engages with its user community using a variety of methods. Most notably, in 2011, NHTS organized the NHTS task force to solicit input from the user community. Based on its research, the NHTS task force presented NHTS with user feedback on suggested updates to the NHTS methodology and survey content, and a number of these suggestions are being implemented in the 2016 NHTS survey. In addition, NHTS convened two meetings of an expert review panel to provide technical guidance on the redesign of the upcoming survey.

Other methods by which the NHTS Program interacts with users include providing direct user support via the NHTS website (e.g., *NHTS User Guides* and FAQs) and responding to requests by phone and email.(13-14) The NHTS Program has conducted a number of formal outreach activities to gather input from its users, including TRB sessions and committee updates, as well as workshops and conferences. Based in part on user feedback, NHTS has introduced more online tools, such as NHTS Academy modules and online analysis tools.

Challenges and Lessons Learned

A key challenge expressed by some FHWA staff is a lack of secure and sufficient funding for the NHTS survey; this makes it difficult to plan for the survey in advance. Minimal staffing makes it difficult to conduct outreach. Another challenge is that NHTS does not have the resources to maximize use of the data within the program by conducting indepth analyses and publishing results under the FHWA/NHTS name. NHTS has to rely on the user community to use the data and publish results, so "often the connection between the data being cited and its source in the NHTS datasets is lost in translation."[4]

From the user perspective, lack of institutionalized funding signals that the NHTS Program is a lower priority program. Add-ons are reluctant to come on board without secure funding. In addition, users feel that the NHTS could be more effective and attract a greater audience if it were conducted on a regular cycle and with greater frequency (3–5 years). They acknowledge that such changes would require more staffing resources and stable funding.

Recommendations

The challenges and lessons learned described by interviewees provide the basis for key recommendations regarding the NHTS Program. Most importantly, NHTS requires a stable source of funding, with surveys that are conducted on a regular cycle, so that users know when to expect the data and can plan accordingly. NHTS would benefit from greater outreach, particularly with Congressional policy staff, but this would require an increase in the number of NHTS staff, as the current staff is stretched very thin.

[4]Former FHWA staff, email correspondence, September 2015.

In terms of tracking its data usage and impact, NHTS must continue to emphasize the importance of (1) citing NHTS when it is used and (2) encouraging users within DOT and other agencies to send the program any reports, publications, and/or models that use NHTS. While the NHTS should continue to track publications in its Compendium of Uses, this tends to represent academic research and reports, so additional efforts are needed to track usage by Federal, State, and local government. Media requests and requests from Government officials should be tracked by FHWA's Public Relations Office in an accessible format (e.g., Microsoft® Excel) so that this information can be easily retrieved and summarized to provide evidence of NHTS impacts.

Conclusions

Although Volpe identified many cases where the NHTS is used in the development of transportation-related reports, presentations, calculations, and models, it was difficult to trace specific impacts of NHTS data. Nonetheless, it was clear from the interviews and identified examples that NHTS data inform a range of policy and legislative decisions, both within transportation, as well as in other fields, such as health and energy. In some cases, NHTS provides context and understanding for how, when, and why Americans travel; trends in travel; and differences in travel by key subgroups. This context helps make the case for particular policy or legislative initiatives. In other cases, NHTS is an important data input to a model or statistical analysis, which is used in turn to influence policy or legislation. At the State and local levels, Volpe found that NHTS has its greatest impact in developing, calibrating, or validating travel demand models that are used to inform transportation planning and project selection.

1. Introduction

The Federal Highway Administration (FHWA) has initiated an effort to evaluate the Research and Technology (R&T) development program. Leaders of governmental transportation R&T programs need to be able to effectively communicate the impacts of their programs. The R&T evaluation program helps FHWA assess how well it is meeting its goals and objectives and provides useful data to inform future project selections.

1.1 Evaluation Objectives

One of the programs being evaluated under the R&T Evaluation Program is the NHTS, which is funded by FHWA through the Office of Highway Policy Information. This survey is conducted periodically (once every 6–8 years) and measures the daily travel behavior and transportation-related attitudes of a nationally representative sample of the American public. Given the massive scale of this data collection effort—a yearlong survey that reaches 150,000 households—and the associated costs of collecting these data, FHWA wants to better understand the impact of this program.

Identifying and measuring these impacts includes documenting how widely and for what purposes the NHTS data are used. Perhaps more important, however, is assessing the longer-term impacts of the availability and use of the survey data by identifying how NHTS data inform policy, program, and regulatory decisions. These types of impacts may be occurring at the Federal, State, or regional level across a range of fields and issues. Assessing the impacts of the NHTS enables FHWA to examine the value of this research program.

1.2 Identifying Key Outcomes and Impact Areas

The Volpe team identified key outcome and impact areas for the NHTS evaluation through initial discussions with members of the R&T Evaluation Team and NHTS staff. An iterative series of discussions led to the development of the NHTS logic model (see section 2.1). The model identifies the inputs, activities, and outputs from the NHTS Program, which produce a mix of short-term outcomes and long-term impacts.

Table 1. Evaluation outcome and impact areas.

Outcomes	Impact Area	Description
Short term	Breadth and Depth of NHTS Use	Documentation of who uses NHTS data, the type of data they are using, the types of analysis they use it to perform, and the purposes for which they are using the data.
Short term	Challenges and Lessons Learned	Identification of process-related hurdles or challenges in the planning, administration, and outreach efforts of the NHTS Program and ways in which the process could be improved.
Short term	NHTS Responsiveness to its User Community	Documentation of ways in which the NHTS has collected information from its user community and any changes to the program that have been based on such user feedback.
Long term	Policy, Project, or Regulatory Decisionmaking	Identification of cases in which the NHTS informed policy, regulatory, program or project decisions within government.

1.2.1 Short-Term Outcomes

First, the evaluation assessed the short-term outcomes of the programs through an examination of the breadth and depth of NHTS data use in national, State, and regional contexts and across a range of users. The evaluation sought to uncover who the NHTS users are, what form of the NHTS data and outputs they use, and the purposes for which they use them.

Another short-term outcome measured challenges and lessons learned regarding the planning, administration, and outreach for NHTS. The main objectives of this analysis were to identify process-related hurdles or challenges and ways in which the process could be improved. The evaluation documented NHTS's responsiveness to its user community, identifying the ways in which NHTS has collected information from its user community and whether and how this feedback was addressed by the program. Both the challenges and lessons learned and user responsiveness portions of the evaluation can provide guidance to future programs based on the experiences of the NHTS team.

1.2.2 Medium- and Long-Term Outcomes

The evaluation also identified whether the use of NHTS data have had an impact on policy and/or program decisionmaking, regulations, or other decisions. While it was not difficult to assess the breadth and depth of NHTS use, it was far more challenging to attribute policy, program, or regulatory decisions to NHTS. The focus of this effort was to document cases showing how NHTS data and outcomes informed such decisions.

1.3 Report Structure

This report is organized as follows:

- **Chapter 1** explains the purpose of the evaluation and provides a high-level description of the project's history.
- **Chapter 2** explains the evaluation methodology, including data sources, data collection methods, and data analysis methods.
- **Chapter 3** explains the findings of the evaluation.
- **Chapter 4** explains Volpe's recommendations for FHWA based on the findings of the evaluation.
- **Chapter 5** explains the general conclusions that Volpe drew from the evaluation.

1.4 Project and Program Background

National travel surveys have been conducted by the FHWA for more than 45 years. The most recent surveys, known as NHTS, were conducted in 2009 and 2001. Prior surveys, known as the Nationwide Personal Transportation Surveys (NPTSs)) were conducted in 1995, 1990, 1983, 1977, and 1969.[15] The surveys are conducted periodically (once every 6–8 years) and measure daily household travel behavior while collecting data on transportation-related attitudes, household members, housing, vehicles, and other demographic information.

The surveys are the only data in the country that link individual personal travel behavior, household demographic and socioeconomic characteristics, vehicle ownership, and vehicle attributes. For each survey effort, data are collected over the course of a year, with sampled households providing information on household daily trips taken in a 24-h period. For each trip, respondents are asked to report trip purpose (e.g., work, school, shopping, recreation, etc.); mode of transportation (car, bus, walking, etc.); travel time; time of day; day of the week; vehicle occupancy; vehicle characteristics (make, model, and year); and respondent demographic characteristics (gender, age, education level, etc.).

In addition to the national sample, States and Metropolitan Planning Organizations (MPOs) may purchase additional or "Add-on" samples. With the more robust sample sizes provided by the Add-on sample, States and MPOs are able to perform more detailed analyses and to drill down to smaller geographic units, such as cities or counties. The 2009 NHTS consisted of a national sample of 25,000 households. Another 20 States and MPOs purchased Add-on samples, totaling 125,000 additional households. Overall, approximately 150,000 households and 300,000 individuals were surveyed. Currently, NHTS is planning its 2016 survey, which will include a national sample of approximately 26,000 households and an Add-on sample of approximately 103,000 additional households from 13 States or MPOs.

1.5 Survey Methodology and Updates

In 2001 and 2009, the NHTS was conducted primarily as a telephone survey, using a random-digit dialing (RDD) sampling frame and Computer-Assisted Telephone Interviewing (CATI) technology to recruit households and to retrieve their responses. During the household recruitment interview, each household was assigned a specific date as their "Travel Day" for which detailed data on travel were collected. All household members who completed the recruitment interview were sent diaries for their travel day. Each household received a reminder call on the day before their assigned travel day; phone calls to collect the diary information usually began the day after the travel day and continued for the next six days.

The 2016 NHTS will undergo significant design changes that include using an address-based sample (ABS), whereby respondents are recruited via mail and retrieval of travel day information is done using a web-based survey. Other changes to the methodology have been implemented, including a revamping of the incentive structure and a focus on activity at each place rather than trip purpose. Overall, the significant changes to the NHTS methodology were deemed necessary to ensure a more representative sample frame and to increase response rates.

1.6 Goals and Outputs

The primary goal of the NHTS is to provide a better understanding of travel behavior in the United States. The data are used for a wide variety of purposes including the following:

- Understanding characteristics of travel (e.g., modes used, purpose of travel, etc.).
- Quantifying the travel behavior of individuals and households.
- Monitoring and analyzing travel behavior over time (trends).
- Connecting the role of transportation to other aspects of people's lives (e.g., health, environment, etc.).
- Examining the relationship between travel and demographics.
- Understanding the public's perceptions of transportation systems.

In describing the goals of the NHTS Program, FHWA staff explained that it provides travel- and transportation-related data to inform decisionmaking in a variety of contexts and that it serves as the foundation for Federal policy and legislation enactments within transportation, as well as other fields, including health, energy, and the environment. According to one interviewee, for example, NHTS research on teen driving risks contributed to the Graduated Driver Licensing (GDL) Laws enacted by States in the 1990s. The NHTS Program also provides data and information to State and local government agencies and organizations, often serving as the only source of local travel behavior data. These data support transportation planning, including project, program, and policy development, as well as transportation evaluation.

The NHTS team is responsible for all aspects of the preparation and administration of this data collection effort. This includes conducting outreach to understand user needs, procuring a survey research firm, finalizing the survey instruments and methodology, submitting the information collection request (ICR) to the Office of Management and Budget for approval (per the Paperwork Reduction Act), managing the Add-on component, and monitoring the contractor and the overall administration of the survey. NHTS staff also collect and make publicly available the travel survey data and all associated user documentation (e.g., codebooks, user guides, etc.). They develop online modules to show users what they can do with the NHTS data and provide online analysis tools to help access the data. The NHTS team provides direct user support for the datasets, reports, and online analysis tools and coordinates outreach events and activities to support the use of the data and findings (e.g., NHTS User Conference, Transportation Research Board (TRB) sessions, etc.). In addition, NHTS develops publications based on the survey findings, including Summary Travel Trends, briefs, and reports.

1.7 Stakeholders

The NHTS is funded and housed in the USDOT's Office of Policy, under the direction of Tianjia Tang. The survey is directly managed by a small team including the Program Manager (Adella Santos) and one part-time contractor. The NHTS effort, however, is supported by a broader team, including an analytic and website support team under contract to Oak Ridge National Laboratory (ORNL) and a survey research firm. In addition, the outreach efforts for the NHTS are also supported by the NHTS task force, made up of leaders in the transportation research community.

2. Evaluation Design

To assist the team in developing an evaluation strategy and plan, the logic model shown in Figure 1 was constructed. A logic model is a tool used to visualize the relationship between program components (i.e. inputs, activities, outputs, outcomes, and impacts). It is not intended to be a comprehensive or linear description of all program processes and activities but is designed to make explicit how program stakeholders expect program activities to affect change. While the evaluation questions seek to uncover the effect of program inputs and activities, the logic model shows how each step in the process plays a role in the creation of outcomes and impacts.

The NHTS logic model describes how FHWA and State Add-on funding is used to support the NHTS staff and its team of contractors as they leverage materials, experiences, and lessons learned from previous travel surveys to develop, execute, and report on the next NHTS. These inputs and activities produce fundamental outputs such as datasets, tools, and user guidance documents as well as indepth summary publications and topical briefs that are released to the user community. This user community creates the short-term usage outcomes and outputs as it actively employs the NHTS data and findings, while the NHTS team supports and responds to their needs. The NHTS data, along with outputs developed by the user community, feed into the decisionmaking system that yields projects, policies, and regulations, creating long-term impact in transportation and beyond.

This evaluation demonstrates the value of the NHTS Program through the examination of select areas of the logic model. These areas are described by the key outcome and impact areas (Table 1).

Figure 1. NHTS Logic Model.

Inputs	Activities	Outputs	Short-Term Outcomes	Medium/Long-Term Impacts
• FHWA R&T funding. • FHWA HQ staff. • State transportation department Add-on funds. • Feedback from users. • Survey research community expertise (outside of transportation). • Contractor support. • Lessons learned from past surveys.	• Work planning. • OMB approval process. • Stakeholder consultation. • Survey planning. • Survey fielding. • Data cleaning and preparation. • Tool development. • Publicizing data and tool availability. • Method review for adequacy and improvement. • FHWA contractor oversight. • Addressing user input.	• Survey data. • Website tools. • Documents detailing stakeholder opinions. • List of users of NHTS data, methods, and citations. • Website statistics. • Guidance and awareness publications (including Users' Forum). • New methods, techniques, and standards.	• Use of data by FHWA Office of Policy. • Use of data by researchers in transportation, public health, etc. • Local/regional modeling. • Quantification of developing trends. • Lessons learned. • Responsiveness to user community.	• Changes in funding for transportation initiatives/policy. • Changes in project selection. • Changes in land use or related regulation. • Unspecified outcomes based on health researchers' activity.

2.1 Evaluation Questions and Key Performance Measures

The Volpe team identified the following four impact areas that mapped to the last two sections of the logic model:

- Breadth and depth of NHTS use (short-term outcome).
- Impacts on policy, project, or regulatory decisionmaking (long-term impact).
- Responsiveness to user community (short-term outcome).
- Challenges and lessons learned (short-term outcomes).

For each impact area, evaluation questions were developed along with key performance measures needed to inform these questions.

The first two outcomes pertain to how the NHTS data are used and their impact as follows:

Breadth and depth of NHTS usage (short-term outcome) seeks to uncover who the NHTS users are (e.g., Government users, academics, consultants, media, industry, etc.) and the range of research questions and topics they are addressing with the NHTS data—both within transportation and in connected fields. In addition, this evaluation topic explores the type and form of NHTS data being used (e.g., datasets, online tools, and publications).

NHTS impact on policy, project and regulatory decisions (long-term impact) demonstrates how NHTS data and outputs inform decisionmaking with respect to policies, legislation, and projects. This evaluation area provides a qualitative assessment of the role of NHTS data, highlighting key examples or cases. The impacts of NHTS data on policy, legislation, and project outcomes is explored at the Federal, State, and local levels; moreover, impacts are assessed not only in the field of transportation, but in other connected fields, such as health, energy, and the environment.

The other outcomes pertain to the NHTS support of its user community and the lessons learned from past NHTS efforts.

NHTS Responsiveness to its user community seeks to understand how responsive the NHTS Program has been to its user community. The measures assess multiple factors that represent responsiveness, including the number of ways in which NHTS solicits feedback and the frequency of its outreach. In addition, this evaluation area provides a qualitative assessment of the changes that the NHTS Program has made in response to user feedback, including changes to the 2016 survey, as well as changes in other outputs or tools. These evaluation questions will deliver an assessment that can guide the NHTS, as well as other programs, in their feedback systems.

The final outcome area, challenges and lessons learned, is a compilation of the challenges and lessons learned in conducting the NHTS surveys, as identified by current and previous Program Managers and the Chief of Travel Monitoring and Surveys Division.[5] The list is meant to be instructive, highlighting issues or topics that may serve as obstacles in the planning, administration, and outreach of the NHTS surveys. By addressing these challenges, FHWA can improve the survey process and outputs, with the long-term goal of increasing the impact of the data in policy and program development. In addition, this evaluation area also presents challenges and lessons learned related to the Add-on program, based on feedback received from a limited set of the Add-on partners.

Table 2 summarizes the key evaluation questions and performance metrics for each impact area of the evaluation. There were four main outcome/impact areas: breadth and depth; policy, project, or regulatory decisionmaking; responsiveness to community; and challenges and lessons learned. The evaluation questions are based on determining how well NHTS serves its user community and whom that community includes.

Table 2. Evaluation questions and performance measures by impact area.

Outcome/Impact Area	Evaluation Question	Key Performance Measure
Breadth and Depth: Website Analysis	To what extent do researchers visit the NHTS website to access information, including the following: • Datasets. • User Guidance Documents. • Online Analysis Tools.	• Statistics on visitors, visits, and total page views per month. • Number of page views (data center, publications, and online tools). • Downloads of data sets, user guidance documents, and publications. • Online tool activations.
Breadth and Depth: Compendium and Presentation Analysis	To what extent does the NHTS do the following: • Serve a range of user types, including Federal staff, States/MPOs, and academics. • Inform a range of fields. • Inform range of transportation related topics.	• Number of citations by user type. • Number of NHTS citations by field. • Number of citations by various transportation topics.
Policy, Project or Regulatory Decisionmaking: Transportation Focused	To what extent and in what way does NHTS data do the following: • Inform transportation policy decisions and rulemaking. • Inform transportation project selection and/or project modification.	• Examples of policy decisions informed by NHTS. • Examples of regulatory actions informed by NHTS. • Qualitative measure of the role. • Role NHTS played in policy and regulatory actions.

[5]While other interviewees were not directly asked a question about challenges and lessons learned, they did provide comments on these topics that are included in the findings.

Outcome/Impact Area	Evaluation Question	Key Performance Measure
Policy, Project or Regulatory Decisionmaking: Non-Transportation Focused	To what extent does NHTS impact non-transportation project selection and/or lead to project modification?	• Examples of projects informed by the NHTS. • Qualitative measure of role NHTS played in project decisionmaking.
NHTS Responsiveness to its User Community	To what extent does NHTS use multiple methods to solicit feedback from its user community? In what ways has NHTS made changes based on user feedback to the following: • Its 2016 survey based on feedback from its user community. • Its outreach (e.g., tools, publications, etc.) based on feedback from its user community.	• Number of different feedback methods used. • Frequency with which NHTS reaches out to user community. • Qualitative assessment of the following: • Effort to collect, process, and act on user feedback. • Changes made to 2016 survey. • Changes made to outreach.
Challenges & Lessons Learned	What challenges and lessons learned has NHTS identified regarding the following: • Survey planning. • Survey administration. • Effective outreach methods. What challenges have Add-on partners identified?	• Compilation of challenges and lessons learned on the following: • Survey planning process. • Survey administration. • Survey outreach. • Compilation of Add-on partner challenges.

2.2 Evaluation Methodology

The data collection that Volpe conducted was primarily qualitative in nature, focusing on a literature search and document review, indepth interviews, and email contacts to provide information for the evaluation. Data from these sources are used in the form of examples and cases to support all of the outcome and impact areas.

Two additional sources of information were provided by the NHTS. The first was the NHTS Compendium of Uses. Volpe accessed this categorized collection of publication abstracts using the NHTS website. The second source was the monthly *NHTS Website Usage Report*, provided by Oak Ridge National Laboratory for the period from July 2013–May 2015.[6] Each source was analyzed separately to inform the breadth and depth of use outcome.

This section describes the data collection and evaluation methodologies in detail and links them to specific outcome and impact areas and evaluation questions.

[6]Website statistics are available through an internal reporting system.

2.2.1 Literature Search and Document Review

Volpe conducted a literature search to gain an initial understanding of the NHTS Program, its stakeholders and users, the survey development process, outreach activities, and outputs. This information came from multiple sources, including the NHTS website,[16] which provided detailed information on NHTS history, goals, and topics covered. The website was also a primary source for downloading NHTS publications, presentations, conference agendas, and external publications, and for viewing user guidance documents, datasets, and online tools. Additional documents were found using web search engines, including Google®,[17] the TRB database,[18] and Volpe library resources. Findings from the initial literature review were used to guide question and topic development for indepth interview guides. These findings were also used as a source of general NHTS information for all of the outcome/impact areas.

A more substantial document review was used to provide detailed information for several of the outcome/impact areas. Documents obtained during the literature search were used along with documents identified during indepth interviews and email contacts. Many of these additional reports, presentations, and models developed with NHTS data were not available online or using library resources. These included materials from Federal and State governments, lead users of the NHTS, and members of the NHTS task force. The documents collected from all sources provided examples and cases to inform the breadth and depth of use; user responsiveness; and policy, project, and regulatory Impact outcomes. The process used to extract this information is discussed in the case categorization section.

2.2.2 Indepth Interviews and Email Contacts

Semi-structured, indepth interviews and email contacts provided much of the information used to inform evaluation questions under the four outcome/impact areas. Volpe worked with the NHTS Program Manager to develop an initial interviewee list and gather contact information. Initial interviews with NHTS staff and lead users yielded additional interviewee contacts via snowball sampling. Because of budgetary constraints and a wealth of interview candidates, primary data collection was split into two groups: indepth interviews (longer) and email contacts (brief). Volpe completed 23 interviews and 18 email contacts (41 total). See Appendix A for a complete list of interviews and email contacts.

2.2.2.1 Indepth Interviews

Interviews were conducted with 23 respondents representing four NHTS stakeholder groups: NHTS Program Managers (current/former) and Office of Policy staff, members of the NHTS task force, lead NHTS users (transportation and other fields), and Add-on partners. The interviews were conducted either in person or by phone and generally lasted 60–90 minutes. Volpe developed a detailed interview guide for each group consisting of 15–20 open-ended questions (with detailed probes). The interview guides included questions that were relevant to each stakeholder group, typically covering a minimum of three of the four outcome/impact areas. Question topics asked for each impact area are shown below.

- **Breadth and depth of NHTS use:** These questions focused on how users were employing the NHTS data: What research questions were being addressed? Which elements of the NHTS were used (e.g., trip rates, demographics, vehicle type, etc.)? What form of the data were used (e.g., raw data, structured findings, online tool outputs)? In what form the output was presented (e.g., models, reports, trends, etc.)?
- **Policy, project, and regulatory decisionmaking:** These questions focused on how NHTS data and findings were used to inform Federal, State, and local planning, policy, and project decisions.
- **User responsiveness:** These questions focused on how NHTS was interacting with the NHTS user community to address current user needs and solicit feedback on issues and future data needs.
- **Challenges and lessons learned:** These questions focused on lessons learned in the areas of survey planning, oversight, and outreach. Add-on partners were also asked about their lessons learned from participating as a partner in the NHTS Program. (This was asked only to a subset of the interviewees.)

2.2.2.2 Email Contacts

Volpe contacted 18 respondents with a small subset of the questions from the indepth interviews. These respondents generally represented NHTS user sub-groups including DOT staff, academics, and NHTS task force members. The questions were distributed by email and collected by email or phone, as needed. The four to five open-ended questions covered only two outcome/impact Areas: breadth and depth of NHTS use and policy, project, and regulatory decisionmaking. An example of the email sent to interviewees is included in Appendix C.

Both the indepth interviews and email contacts requested supporting documents, when available, to provide specific examples and cases of NHTS use. All interviewees were asked questions related to breadth and depth of NHTS use; policy, project, or regulatory decisionmaking; and NHTS responsiveness to its user community. However, questions related to challenges and lessons learned were asked of only a subset of the interviewees, including NHTS Program Managers (current and previous) and other staff from FHWA's Office of Policy.

Table 3. Interview topics by interview audience and type.

Indepth Interview topics	Program Manager/Office of Policy	Task Force Members	Lead Users – Transportation & Non-transportation	Add-on Partners	Email Contacts
Background/General	X	X	X	X	X
Breadth and Depth of Data Use	X	X	X	X	X
User Responsiveness	X	X	X	X	
Challenges & Lessons Learned	X			X	

2.2.3 Interview Analysis

The interviews and email contacts yielded detailed notes with examples and key quotes for each outcome/impact area covered in the interview. These detailed examples and quotes were entered into a spreadsheet under the appropriate outcome/impact area. Additional information describing each example or quote, such as user type, field, topic, or level of government was also coded to provide the context for the example or quote. These examples and quotes then served as raw materials to be used to inform the evaluation questions.

2.2.4 Case Categorization

In addition to the anecdotal examples and quotes pulled from the indepth interviews and email contacts, the Volpe team assembled a more formal case database used to provide concrete examples of how NHTS was used to inform policy, project, and regulatory decisions. The documents obtained through the literature search, indepth interviews, and email contacts provided such cases.

The cases were organized by the impact area they supported, and included additional information to allow sorting by topic, purpose, type of decision supported and applicable level of government. In building its database Volpe sought to understand both what NHTS data were used to support decisions and in what form the data were fed into the decisionmaking system. The cases can be described as providing decisionmaking support either directly or indirectly.

Direct Support. This category describes cases where the NHTS is used in the form of descriptive data or trends. NHTS data and/or findings are delivered to decisionmakers in the form of statistics, trends, or travel topics by way of reports, presentations, and testimony.

Indirect Support. The second category includes cases where the NHTS supports decisions indirectly, as an input (along with other data) into models, calculations, and research that are used in the decisionmaking processes. An example of indirect support includes Highway Statistics Vehicle Miles (VM-1), which uses NHTS vehicle occupancy data.

2.2.5 Analysis of NHTS Website Statistics

The analysis of the Website usage reports from July 2013 to May 2015 is a descriptive analysis of the monthly usage numbers. ORNL compiles this data for the NHTS Program and provided Volpe with a copy of its monthly reports.

This analysis assessed monthly usage in multiple ways to get a sense of the overall magnitude of NHTS usage. It examined the website outputs individually and in relation to one another. The outputs include the following:

- Visitor statistics (e.g., monthly visitors, monthly visits, and average visits per visitor).
- Page view statistics.
- Dataset downloads (e.g., total monthly downloads and number of datasets downloaded).
- User Guidance document downloads.
- Online tool activations.
- Publication downloads.

The analysis also attempted to discern any trends or usage patterns from the data by plotting the monthly usage statistics during the 23-month period. Unfortunately, data prior to July 2013 were not available, so it is not possible to discern changes in website usage because of the release of NHTS data. Volpe can provide only a very limited snapshot of trends.

2.2.6 Analysis of NHTS Compendium of Uses

To inform the assessment of the Breadth and Depth of NHTS data use, Volpe analyzed the 2014 NHTS Compendium of Uses,(1) a document developed by the NHTS staff that provides a comprehensive catalogue of publications citing the NHTS in that year. Volpe based its analysis on the existing classification system of 11 categories but tailored it after conducting a pilot analysis indicating that additional classification information was needed to answer the evaluation questions. It should be noted that while the Compendium is the best available source on published NHTS documents, it does not provide an exhaustive compilation of its uses. Through document reviews and interviews, Volpe learned that NHTS users also develop documents and reports, models and statistics, and other outputs that are not published or publicly distributed, and hence are not included in the Compendium.

2.2.6.1 Field and Topic Analysis

After completing a pilot analysis consisting of categorizing a sample of publications from each original subject area in the 11 Compendium categories, Volpe moved from the original classification system to a two-tiered system made up of fields and transportation topics. Some original categories became fields, others remained as topics, and new fields and topics were added to acknowledge emerging NHTS uses. Table 4 shows how the original Compendium categories fit into the two-tiered structure.

Table 4. New classification system for 2014 compendium analysis.

Original Categories	Fields	Transportation Topic	Description of Field/Topic
N/A - Field Added	F1. Health	-	Measuring, protecting, or improving overall well-being of communities of people.
N/A - Field Added	F2. Transportation	-	Act or means of moving goods or people.
1. Energy Consumption	F3. Energy	-	Measuring resources, mechanisms, and impacts for storing and using power supplies.
2. Environment	F4. Environment	-	Measuring the impact on natural surroundings, including land use and air quality.
3. Survey, Data Synthesis, and Other Applications	F5. Survey Methods, Administration, and Data Analysis	-	Using, evaluating, or comparing data collection and analysis methodologies.
4. Demographic Trends	-	T1. Demographic and Travel Trends	Research on travel behavior (including among subgroups) during time.
5. Trend Analysis and Market Segmentation	-	T1. Demographic and Travel Trends	Research on travel behavior (including among subgroups) during time.
6. Travel Behavior	-	T2. Travel Characteristics and Behavior	Environments or triggers that influence traveler actions.
7. Transit Planning	-	T3. Transit Planning	Transit related research and operations.
8. Traffic Safety	-	T4. Traffic Safety	Infrastructure and design of transportation systems impacting level of traveler safety (including bike and pedestrian).
9. Policy and Mobility	-	T5. Policy and Mobility	Planning, programming, and related policies (e.g., gas tax, freight).
10. Special Population Groups	-	T6. Special Populations	Research surrounding specific groups of people (e.g., elderly, children).
11. Bicycle and Pedestrian Studies	-	T7. Bike and Pedestrian Studies	All nonmotorized transportation issues.
N/A - Topic Added	-	T8. Innovative Technologies	Research advancing transportation systems (e.g., electric vehicles, mobile devices, etc.).

A total of 313 publications were analyzed from the 2014 Compendium.(1) Each publication included an abstract and citation used to complete this analysis. For each publication, the categorization was completed in two parts. First, based on a review of the abstract, Volpe assigned the publication a primary field. Second, Volpe determined the transportation topic(s) represented in each publication regardless of field.

To help give focus to the NHTS use in a publication, Volpe assigned only one primary field to each publication. The fields show how the NHTS provides information to a variety of disciplines beyond transportation. While only one field was selected, multiple transportation topics could be selected for each publication. Within the transportation field, Volpe further designated the topics as primary and secondary when multiple topics were identified.

Another important component of use includes identifying the range of users developing research, reports, and presentations using these data. Looking at these users allows us to better understand how the NHTS influences decisionmaking at the local, regional, and national level. For this section, Volpe conducted two types of analysis: first, analyzing the lead authors of the publications listed in the 2014 Compendium,[1] and second, analyzing the lead presenters at major NHTS conferences,[5] workshops, and presentations (2004–2015).

3. Evaluation Findings

This chapter presents evaluation findings for each of the four key impact areas, summarizing findings for each of the key performance metrics.

3.1 Breadth and Depth of NHTS Usage

Findings on the breadth and depth of NHTS usage were explored using NHTS website statistics as well as an analysis of the Compendium of uses documents compiled by the NHTS Program.

3.1.1 Website Usage Statistics

An analysis of monthly website usage data from July 2013 to May 2015 provides insights on the magnitude of use of NHTS tools and outputs as well as patterns of usage. Key questions included the following:

- To what extent do researchers visit the NHTS website to access information?
- To what extent do researchers download NHTS datasets and user guidance documents and information?
- To what extent do researchers use the online analysis tools?
- To what extent do researchers download publications?

A key limitation of the analysis is that we do not know the extent to which new visitors, versus repeat visitors, are accessing the site and its components on a monthly basis.

The analysis of website usage statistics reveals robust website usage and an overall cyclical trend in how the NHTS data and outputs are used, with peaks generally in the early fall and spring each year and diminished use in the summer and winter months. In the period studied, July 2013 to May 2015, monthly visitors ranged from a low of 2,700 to a high of 4,949. Monthly visits also varied month to month, ranging from 4,545 visits in the slowest month to more than 9,340 in in the busiest, with an average of 1.7 visits per visitor. The range in usage stems from both the cyclical usage trend as well as a period of increased usage starting in August 2014. Despite the fact that six years have passed since the release of NHTS data, users continue to visit the website.

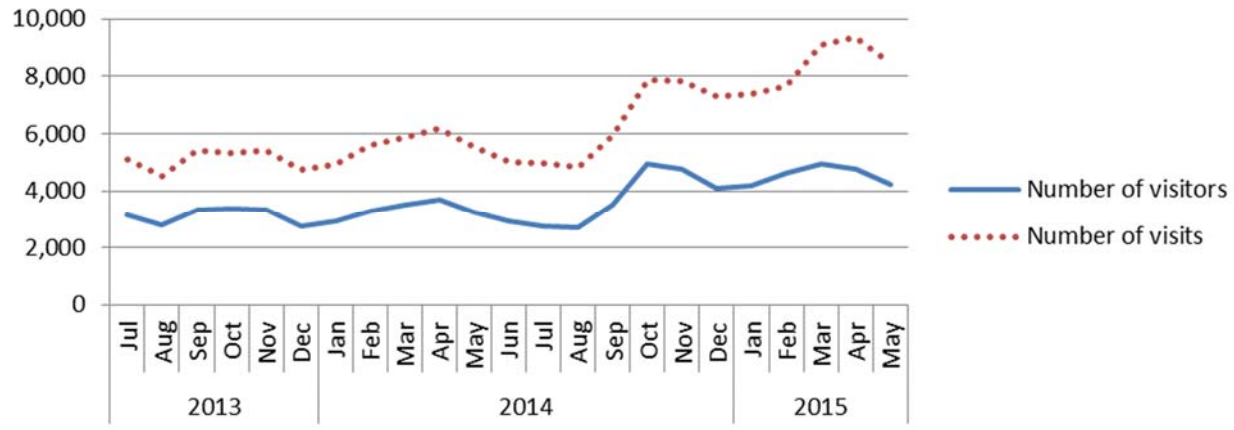
These data also suggest that users are accessing different outputs and tools on the NHTS website. The NHTS Publications section tended to be the most accessed portion of the website, which speaks to the value of this Publication among users. The online *Table Designer* is another frequently used tool, although it shows wide usage swings. Materials supporting the raw NHTS data including the 2009 *NHTS Datasets, Codebooks* and *User Guides*[19] are downloaded by a smaller set of users. The Online Codebook page, however, did see a higher number of activations.

The following sections provide detailed findings, supported by charts and graphs.

3.1.1.1 Website Traffic

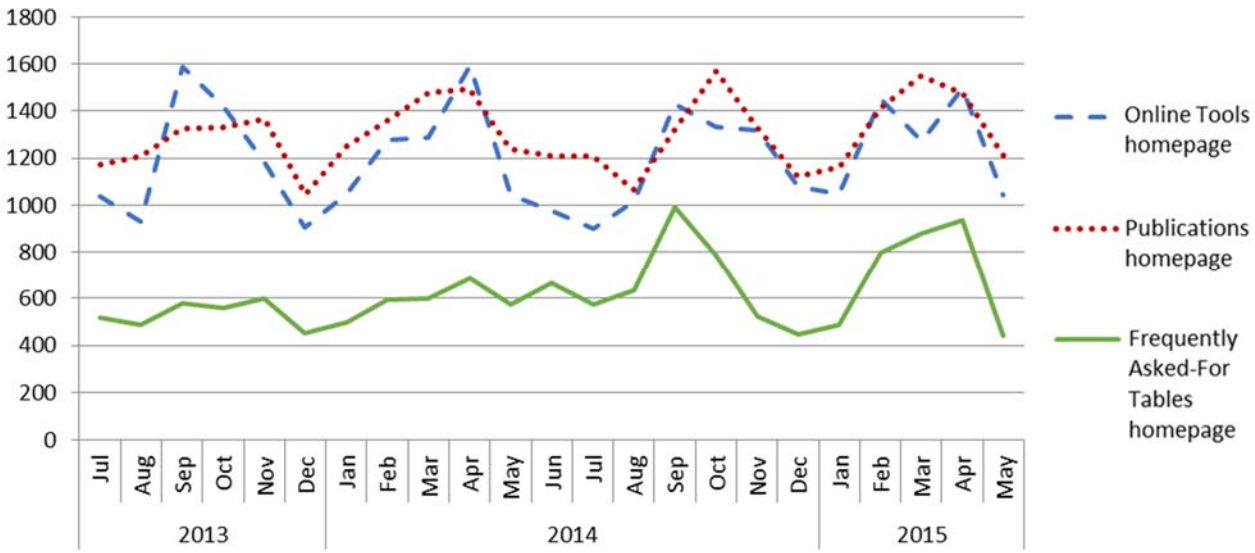
Website traffic, shown in Figure 2, conveys an increase in visits during the second half of the period studied. Monthly visitors ranged from 2,757 to 3,686 for the 12-month period (July 2013–June 2014) with visits ranging from 4,535 to 6,176 monthly. Starting in August 2014, usage increased significantly, ranging from 2,700 monthly visitors (4,825 monthly visits) to 4,949 visitors (9,340 visits) in the spring. Over this short period of time, a trend of increased monthly visits is evident, even as visits ebb and flow through the seasonal usage cycle.

Figure 2. NHTS website traffic, July 2013–May 2015.



Homepage view of Online Tools and Publications (Figure 3) follow the same cyclical trend as the website traffic but do not show dramatic usage increases. Online Tools received 900–1,600 homepage views per month, while views of the publications homepage were 1,000–1,600. Frequently Asked-For Tables shows only a weak cyclical trend, with relatively flat usage in July 2013–June 2014 (roughly 450–700 homepage views monthly). There was a surge in views during the peak periods of fall 2014 and spring 2015, with more than 900 views in both September 2014 and April 2015. This tracks with the increased number of visits seen on the overall website during this time.

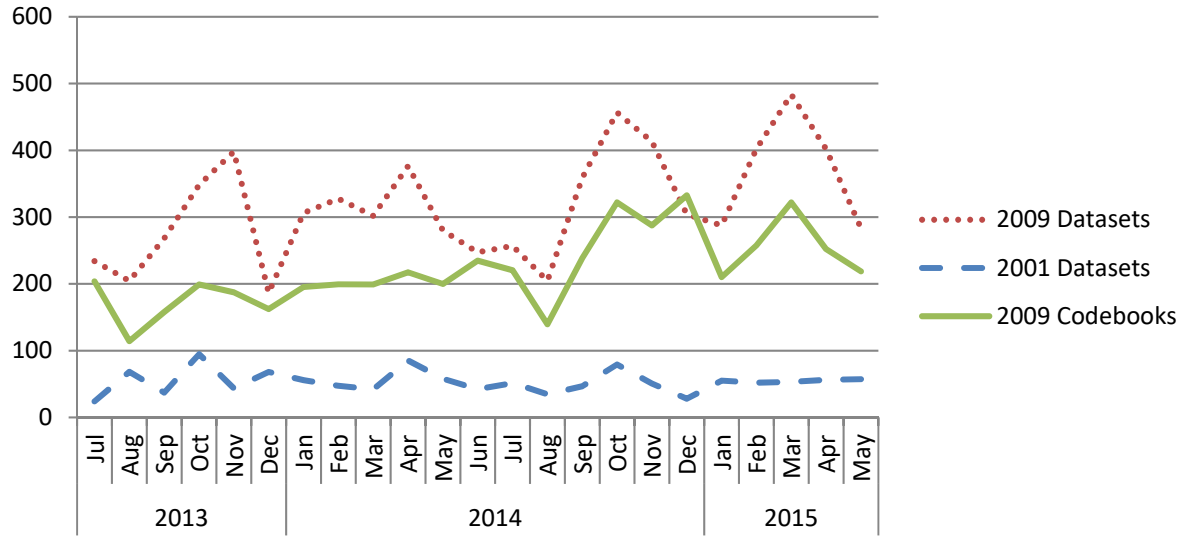
Figure 3. NHTS website tool homepage views, July 2013–May 2015.



3.1.1.2 Datasets and Guidance Documents

The NHTS data related outputs such as the 2009 Codebook and 2009 Dataset are used by a much smaller set of NHTS users (Figure 4). The 2009 Codebook was downloaded only 114–333 times per month, while the 2009 dataset was downloaded slightly more often (roughly 200–500 times per month). The 2001 Dataset showed even lower usage, ranging from 25–100 downloads per month. Both 2009 Codebook downloads and 2009 Dataset downloads seem to benefit from the increase in visits and visitors after August 2014. User Guides (not shown) tend to have similar usage levels, ranging from 250–500 downloads per month, with again a slight increase starting in the fall of 2014.

Figure 4. NHTS website dataset and codebook downloads, July 2013–May 2015.

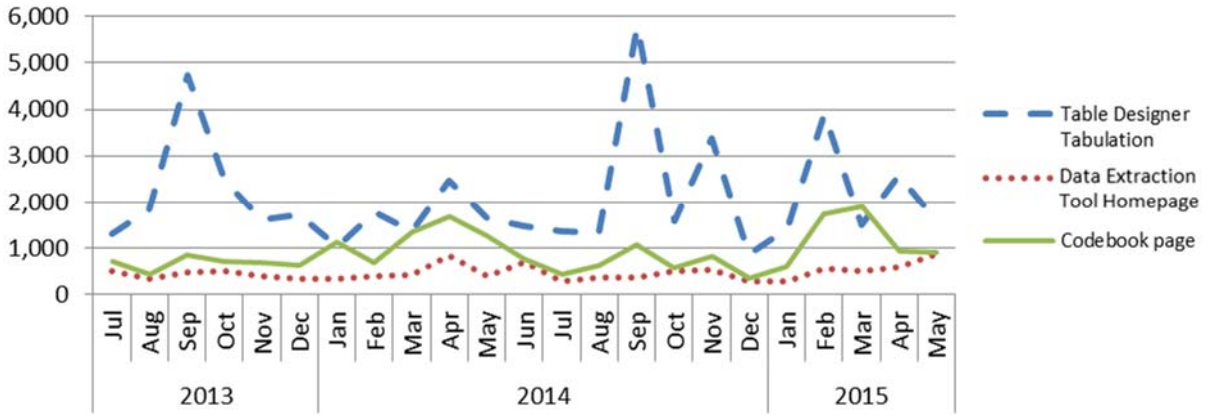


3.1.1.3 Tool Activations

Of the number of online analysis tool activations, the Table Designer Tabulation had the most usage as well as the most volatility, with fall and spring peaks proportionally much larger than that of the other online analysis tools (see Figure 5). This tool sees spikes of heavy usage in peak periods, with usage levels ranging from under 900 activations per month in slower times to close to 6,000 per month at peak. It is interesting to note that usage seems to increase starting in August of 2014, which tracks with overall increases in visits and visitors, but Volpe did not see increased homepage views for the Online Tools homepage. It is possible that repeat users are linking directly to the Table Designer tool.

The Codebook tool gets three to five times more activations than its downloadable counterpart (see Figure 4), ranging from 350–1,900 activations per month. This tool shows a weak yearly cycle, with more pronounced usage peaks in the spring. This tool does not seem to be affected by the increase in visits during the second half of the analysis period. The Data Extraction Tool, with the lowest activations, does not seem to be very affected by the increase.

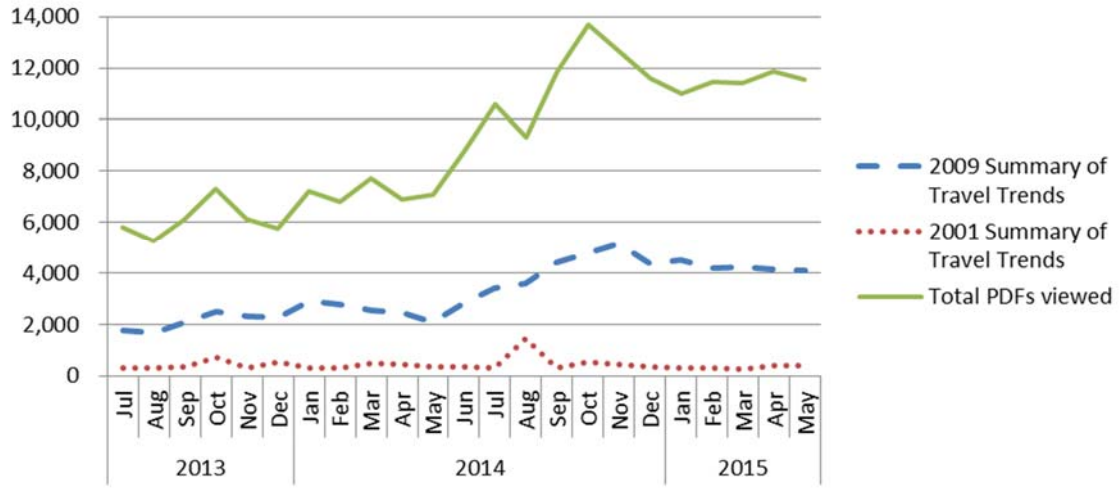
Figure 5. NHTS website online tool activations, July 2013–May 2015.



3.1.1.4 Publication Downloads

Publications tends to be one of the most accessed areas of the NHTS website. The summary measure Total PDFs Viewed includes the 2001 and 2009 Summaries of Travel Trends (also broken out individually), as well as the compendiums and briefs, journal articles, reports, and presentations that are provided by the NHTS website. Publications viewed doesn't seem to follow the cyclical trend as closely as other NHTS products (Figure 6). It does, however, show that it has been influenced by the increased number of visits and visitors, as usage climbs through the analysis period. Total PDFs Viewed ranges from a low of 5,253 (in August 2013) to a high of 13,713 (in October of 2014), with views leveling off to about 12,000 in May 2015. The 2009 Summaries of Travel Trends sees a similar trend of increased views, ranging from a low of 1,682 views per month to a high of 5,132, making it one of the most accessed NHTS outputs. Downloads of the 2001 document are relatively stable (with the exception of August 2014), as predictably, it is downloaded much less frequently than the 2009 document.

Figure 6. NHTS website publication downloads/views, July 2013–May 2015.



3.1.2 Compendium Analysis

To inform the evaluation of the breadth and depth of NHTS data use, Volpe analyzed in depth the NHTS 2014 Compendium of Uses[1] and compared summary data from the 2011–2013 compendiums[3,4] to understand how the topics and themes have changed or evolved throughout time. Key questions included the following:

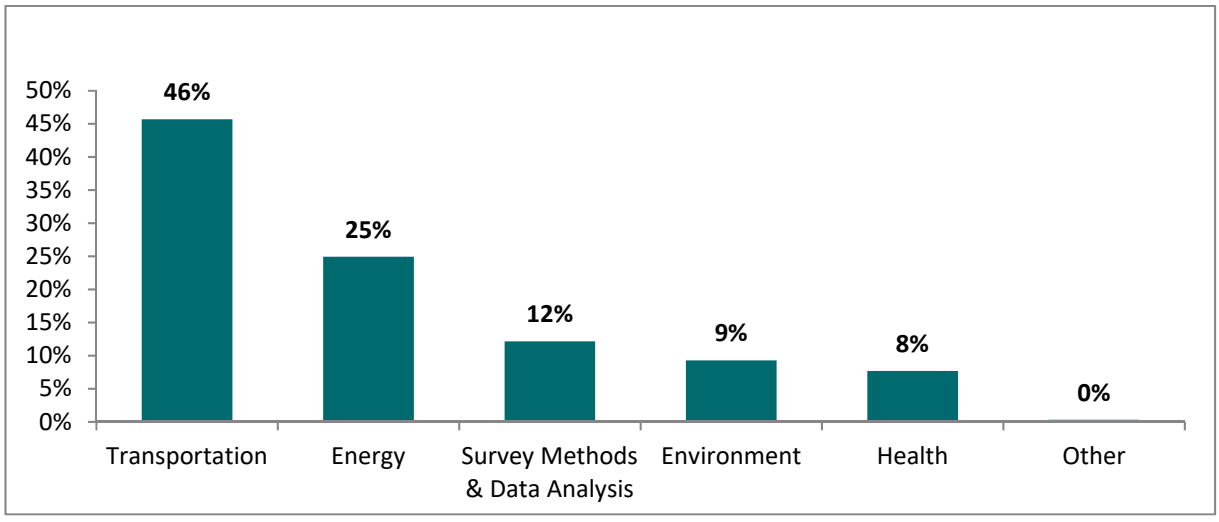
- To what extent are NHTS data used across a range of fields?
- To what extent are NHTS data used across a range of transportation related topics?
- To what extent does NHTS serve a range of user types including Federal staff, States/MPOs, and academics?

3.1.2.1 Transportation Fields and Topics

Almost half of the publications (46 percent) in the Compendium share the primary field of transportation, as illustrated in Figure 7. This is not surprising for a dataset with a primary focus on household travel. However, it is interesting that more than half of the publications have primary applications in other fields. After transportation, energy consumption is the next most popular field at 25 percent, followed by survey methods and data analysis at 12 percent, environment at 9 percent, and health at 8 percent. These data indicate that the NHTS is being used across a range of fields and that the data have utility beyond transportation.

Health emerged as a field worth highlighting and included several transportation topics: bike and pedestrian issues, travel characteristics and behavior, and, most notably, policy and mobility (Table 4). Publications, including the policy and mobility topic, had a strong focus on public health issues (e.g., physical activity correlation with obesity and cancer, health benefits of land use and transportation plans, and neighborhood parks and adolescent stress reduction, etc.).

Figure 7. 2014 NHTS compendium primary fields.



A range of transportation topics were covered within each field, as shown in Table 5. The topic travel characteristics and behavior is seen regularly across fields. The policy and mobility and demographics and travel trends topics are also covered to some extent in all fields. Innovative technologies dominates the energy consumption field (94 percent) and also has applicability to survey methods (34 percent) and to a lesser degree environment (24 percent) and transportation (15 percent) publications. Other topics such as bike and pedestrian, special populations, and traffic safety tend to fall within the transportation and health fields.

Looking specifically at the distribution of transportation topics within the transportation field (column 2 of Table 5), the data show that travel characteristics and behavior (62 percent) and policy and mobility (56 percent) are the leading topics covered by the Compendium publications, followed by demographics and travel trends (36 percent). Bike and pedestrian and special populations are covered by one-fifth of the publications. More specialized topics such as transit planning, innovative technologies, and traffic safety are seen less frequently.

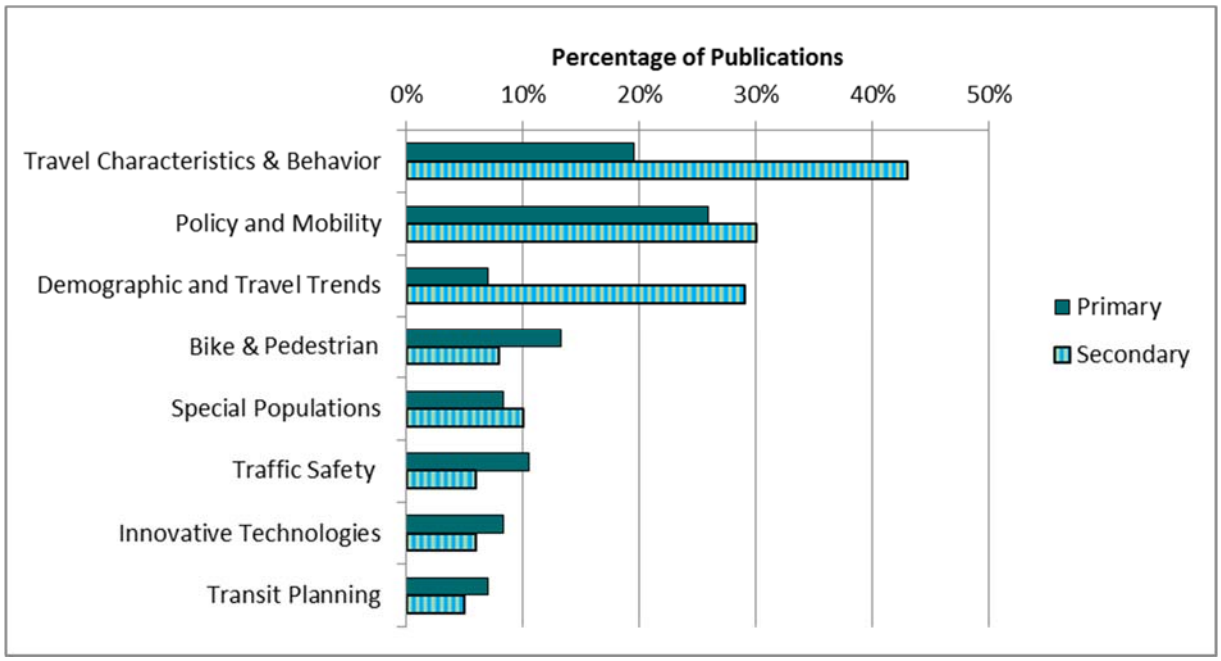
Table 5. Transportation topics by field.

	Transportation	Energy	Survey Methods & Data Analysis	Environment	Health
Travel Characteristics & Behavior	62%	35%	58%	28%	50%
Policy & Mobility	56%	15%	42%	76%	58%
Demographics & Travel Trends	36%	14%	21%	38%	38%
Bike & Pedestrian	21%	0%	8%	0%	38%
Special Populations	19%	1%	0%	0%	21%
Traffic Safety	16%	0%	0%	0%	13%
Innovative Technologies	15%	94%	34%	24%	0%
Transit Planning	12%	4%	3%	7%	8%

Note: Because multiple topics could be checked for each field, the percentages sum to more than 100%.

Figure 8 illustrates the distribution of transportation topics (within the transportation field) classified as either primary or secondary (e.g., a publication's primary topic is Transit Planning, but also relates to, or has secondary topics of, Bike and Pedestrian and Demographics and Travel Trends). Travel Characteristics and Behavior and Policy and Mobility are cited frequently as both primary and secondary topics. Demographics and Travel Trends are more likely to be secondary topics within the Transportation field. The dominance of these three categories in Table 4 is further explained here. These subjects have wide applicability to other topic areas and therefore overlap with a greater number of Compendium topics. Other topic areas (e.g., Bike and Pedestrian, Traffic Safety, and Transit Planning) tend to be more focused, and hence have a greater distribution of primary, compared to secondary, classifications. These data demonstrate that the value of the NHTS is both its wide range of topics covered and also the value of the interaction of these categories to explain both general and specific topics related to transportation.

Figure 8. Transportation topics summary, primary vs. secondary (within transportation field).

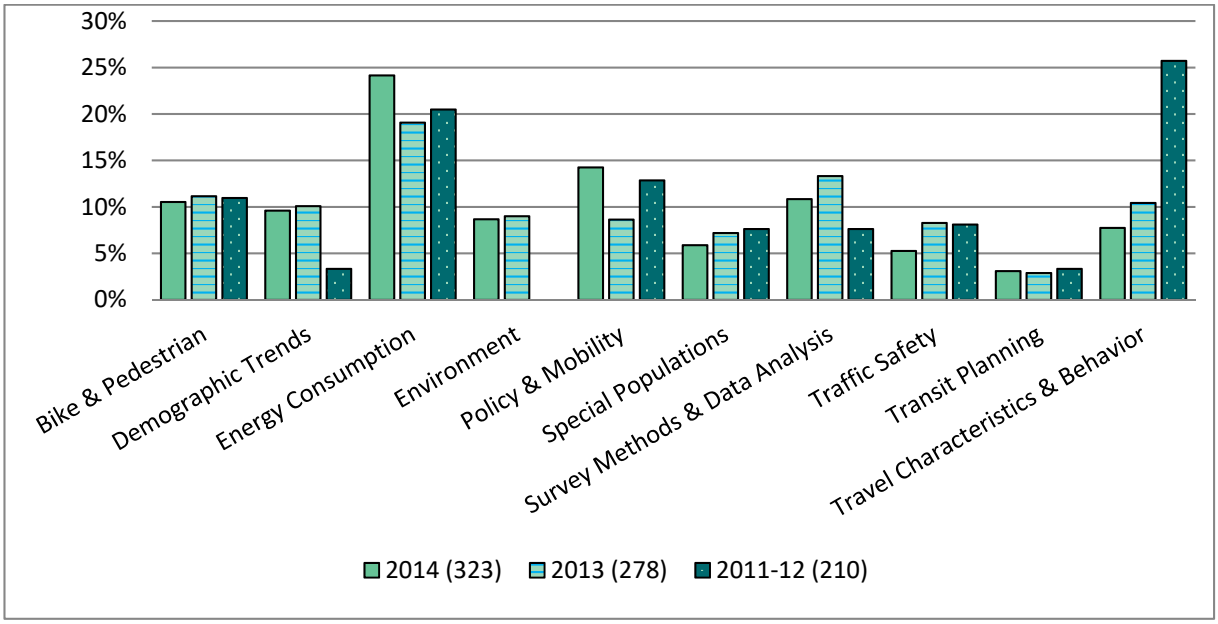


While Volpe was not able to analyze each Compendium to the scale conducted for 2014, a high-level analysis was performed to look at how transportation topics may have shifted throughout time. As illustrated in Figure 9, the 11 original NHTS categories were compared across the 3 latest Compendiums (2011–14) to see if any shifts in topic focus could be identified.[7]

While the frequency of some topics remained unchanged (e.g., bike and pedestrian), others have shifted fairly dramatically (e.g., travel characteristics and behavior, demographic trends). For these two categories, it is possible that the content of the publications has not changed as much as the classification of the publications (because of overlap with other topics). As seen in Figure 9, travel characteristics and behavior is a topic that often co-exists with one or more other topics in NHTS-related publications, such as demographics and travel trends. Other topics that show some increase include energy consumption and survey methods and data analysis.

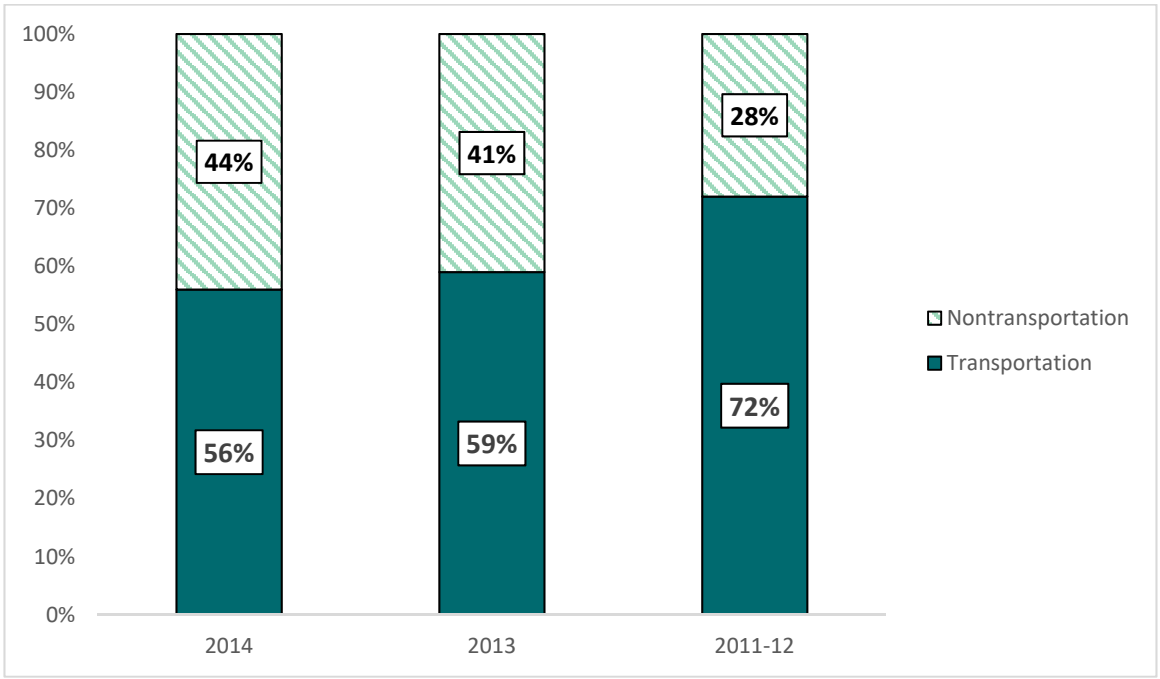
[7]For the trend analysis, when the NHTS original categorization is used, 56 percent of publications in the 2014 Compendium are classified as transportation topics (Figure 10). Using the Volpe categorization, however, that statistic is 46 percent (Figure 7), because Volpe added a separate topic for health.

Figure 9. 2012–2014 NHTS compendium original classification summaries.[8]



The increased citations for energy consumption and survey methods and data analysis are further demonstrated in Figure 10, which divides publications into Transportation or Non-Transportation categories. The data shows that NHTS is growing its reach to other fields outside of Transportation (i.e., Energy, Environment, and Survey Methods and Data Analysis), illustrating the value that this dataset provides beyond transportation.

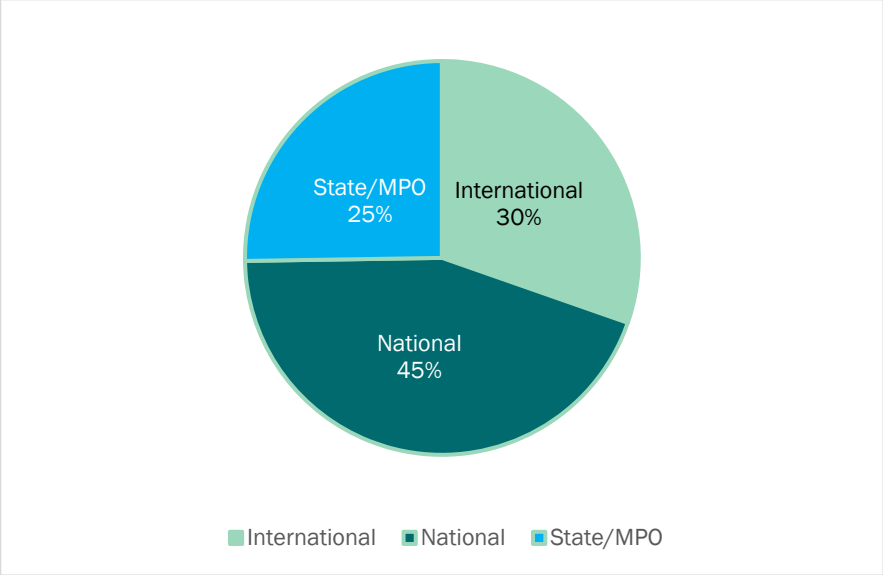
Figure 10. 2012–2014 NHTS compendium original classification summaries.[9]



[8]Values in parentheses equal the number of Compendium publications for that particular year.
[9]Non-transportation topics/fields include energy, environment, and survey methods and data analysis.

In addition, data from the Compendium was used to provide a snapshot of user types and applications. Figure 11 presents a summary of NHTS use classified by whether the focus of the publication was national, State/MPO or international. Nearly half of publications (45 percent) are related to research topics with impacts at the Federal or national level, 30 percent are related to work with an international focus, and State or MPO/Regional research followed closely at 25 percent. While the international emphasis was surprising, it seems that NHTS data were used in these cases to compare travel trends, behaviors, or survey methodologies with geographic areas outside of the United States. These data illustrate that the NHTS has utility across multiple spheres, providing information on topics that are national as well as local in scope and enabling decisionmakers to understand U.S. travel behavior as it compares to travel in other countries.

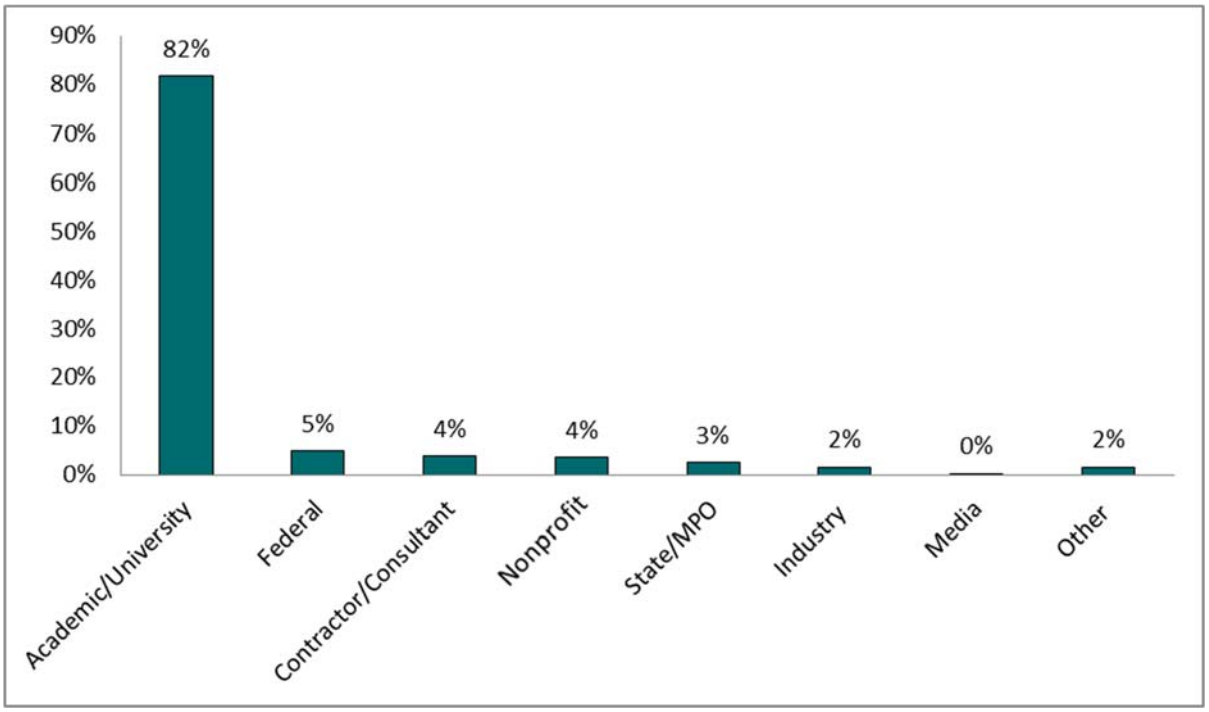
Figure 11. 2014 NHTS compendium publications by application.



3.1.2.2 Range of Users Analysis

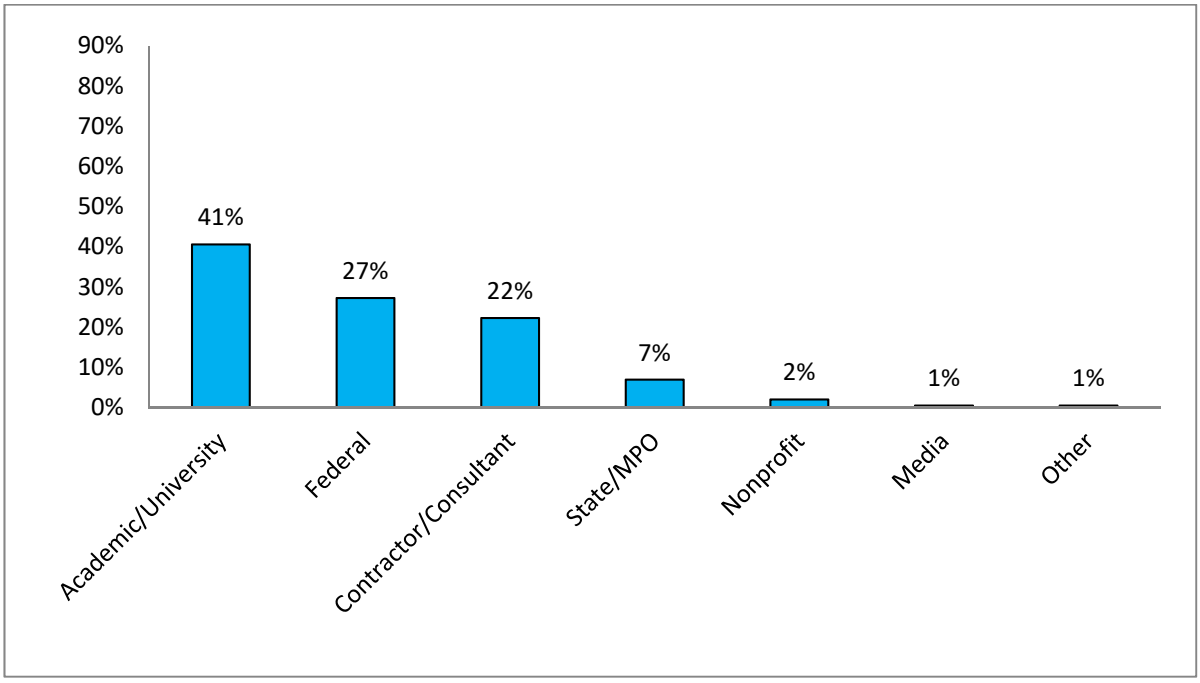
The vast majority of publications captured in the 2014 Compendium(1) (82 percent) are written by academics or by those in organizations associated with universities. Eighteen percent of these tend to be students working on undergraduate, Masters, or Doctoral theses. Very few of the 300+ publications come from government employees (Federal, State, or local), transportation consultants, or those in industry or media. Although the percentage of academics seems high, the analysis does not account for the fact that the academic organization may be doing research for or with the government or for the private sector. In addition, academics are more likely to publish their findings; thus these sources are more likely to be captured by the compendium.

Figure 12. 2014 compendium lead author by organization type.



The lead presenters at NHTS-sponsored conferences, workshops, or TRB sessions represent a wider mix of NHTS users than does the 2014 Compendium[1] (see Figure 13). Only 41 percent of presenters come from academic or university-related organizations, while 27 percent are from different areas of the Federal Government (USDOT and other organizations). Transportation consultants who work with the NHTS also make up a large portion of presenters (22 percent). State and regional governments and nonprofits make up a smaller share of presenters.

Figure 13. NHTS conference/workshop lead presenters by organization type.



It should be noted that the data presented in figure 12 and figure 13 (compendium lead authors and lead presenters) is not generalizable, nor is it representative of all users; rather, it provides a snapshot of users based on two distinct data sources. As noted previously in the Methodology section, NHTS users do not always publish their work, and in some cases, users do not cite the NHTS directly, so it is not possible to develop a complete listing of all NHTS uses and users.

3.2 NHTS Impact on Policy, Project, or Regulatory Decisionmaking

The logic model developed for this evaluation proposes that the NHTS creates long-term impact by informing decisionmaking in the areas of policy, projects, and rulemaking. These policy, project, and rulemaking decisions occur at the local, State, and Federal levels of government. This examination of the NHTS impact on decisionmaking focused on four evaluation questions:

1. To what extent and in what way does NHTS data inform transportation policy decisions and rulemaking?
2. To what extent and in what way does NHTS data inform non-transportation related policy decisions and rulemaking?
3. To what extent does NHTS impact transportation project selection and/or lead to project modification?
4. To what extent does NHTS impact non-transportation project selection and/or lead to project modification?

Although Volpe identified many cases where the NHTS is used in the development of transportation-related reports, presentations, calculations, and models, there were few formal documents detailing how NHTS data or findings fed directly into policy, project, and rulemaking decisions. Policy and decisionmaking proceedings are not always transcribed and even those that are often fail to attribute discussions of travel behavior to the NHTS. In addition, the products of such proceedings (legislation, testimony, and project approval) often fail to directly credit the NHTS, as it is one information source of many. In addition, policy and program decisions do not hinge on any single data source. As one interviewee noted:

> *"NHTS is one of many sources that informs policy, project, and regulatory decisions. It would not likely be a driver of any decision but instead a contributor to many."*[10]

Another interviewee noted that it is difficult to trace NHTS use because transportation policymaking tends to be decentralized.

> *"Transportation policy is thought of as a State/local issue. Policymaking and funding is much morediffuse, compared to other agencies."*[11]

Interviews with NHTS Program staff, FHWA staff, and lead users proved more successful as many anecdotes were provided describing how NHTS was used as a source of information for policy, project, and regulatory decisions.

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[10]FHWA Staff, in-person interview conducted by Margaret Petrella (Volpe) and Lora Chajka-Cadin (Volpe). March 2015.

[11]Former FHWA Staff, in-person interview conducted by Margaret Petrella (Volpe) and Lora Chajka-Cadin (Volpe). March 2015.

This evaluation topic is organized according to the following three subtopics:

- NHTS Use for Federal Transportation Policy and Rulemaking (3.2.1)
- NHTS Use for Policymaking in Nontransportation Fields (3.2.2)
- State and Local Use of NHTS Data for Planning, Policy, and Project Selection (3.3.3)

3.2.1 NHTS Use for Federal Transportation Policy and Rulemaking

Across all the interviews, NHTS Program Managers and lead users reported that the NHTS provides critical information to the Federal government for the purpose of understanding the current travel environment, examining trends in travel behaviors, and examining transportation issues in key sub-populations. One lead user commented that:

> *"Travel behavior is very complex … [NHTS] builds a mosaic of understanding and provides context, based on data; evidence can ripple through the system and have an effect. [NHTS] informs conversation about important topics."*[12]

The NHTS is the only source of data to provide a comprehensive picture of all travel for the entire U.S. population. This information provides the foundation on which transportation policy and funding legislation are built. As described by one interviewee:

> *"[Policymakers] need representative data to give them a solid foundation in which to evaluate the present and the needs of the future. [NHTS] impact is not explicit… it gives the broad context …"*[13]

Several NHTS outputs serve this role, providing important information on trends in travel and findings on key travel-related topics. The *NHTS Summary of Travel Trends,*(5) for example, is the primary compilation of NHTS findings. This document is developed by NHTS staff using data from current and previous NHTS cycles. It highlights travel trends and commuting patterns in eight areas: travel and demographics, household travel, person travel, private vehicle travel, vehicle availability and usage, commute travel patterns, temporal distribution, and special populations. This document is available to users within and outside the Federal Government through the NHTS website(16) and is cited by countless other transportation-related research and reports, including those detailed below (e.g., *C&P Report, Beyond Traffic Report,* and *Commuting in America).*(6)

The *NHTS Policy Briefs*, also developed by NHTS staff, use NHTS data to address a relevant transportation topic. The topics are selected based on what the NHTS team hears while attending OST planning sessions or TRB conferences, listening to user feedback, or noting current trends in the media. These documents provide a deep dive into one transportation topic of social or legislative importance and are available via the NHTS website. Policy Brief topics have included *Mobility Challenges for Households in Poverty,*(20) *Changes in the US Household Vehicle Fleet,*(21) *and Active Travel,*(22) among other topics. The NHTS Policy Briefs feed directly into policy discussions within transportation and other fields; they also inform reports, such as former Secretary of Transportation Anthony Foxx's *Beyond Traffic* Report,(6) which is described in more detail in the next section.

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[12]Transportation Consultant, phone interview conducted by Margaret Petrella (Volpe), April 2015.

[13]Transportation Consultant, phone interview conducted by Margaret Petrella (Volpe) and Lora Chajka-Cadin (Volpe). April 2015.

3.2.1.1 NHTS Use in DOT Reports and Initiatives

NHTS data are incorporated in DOT Reports that are widely circulated within and outside of the Federal Government and are used to inform both policy and legislation. One notable example is the *Beyond Traffic Report,*[6] issued by former Secretary of Transportation Foxx. In the Trends chapter, *NHTS Summary of Travel Trends* findings contribute to the discussion of the changing travel behavior of millennials and older Americans. The NHTS Income Inequality Brief[20] was used to develop a section that focused on income inequality and the financial burden that transportation puts on working class families. Other chapters cite the use of the travel trends document as a source of information on why people travel, how much they travel, and the mode of transportation used, including a section on biking and pedestrians.

While it is too early to determine the type of impact that the *Beyond Traffic Report*[6] will have on policy and legislation, this document serves as a resource to inform the conversation between transportation users, operators, and providers and the legislators and policymakers who shape the transportation landscape. This document reports on the current and predicted future conditions of our transportation system, enabling discussion on what our country needs to do to support our transportation system and why it needs to be done. The report is still a draft but has already been distributed extensively to members of Congress and State and local elected officials. In addition, the report has already been downloaded more than 370,000 times (as of 8/12/15).

The Safer People, Safer Streets: Pedestrian and Bicycle Safety Initiative[23] by former Secretary of Transportation Foxx, which addresses nonmotorized safety issues in communities, provides another example of how NHTS data inform the policy conversation. Data from the 2001 and 2009 NHTS are used to understand the national use of biking and walking for daily travel. More specifically, NHTS provides information on walking and bicycling trips in relation to other travel modes and within important sub-populations such as millennials. This contextual information helps frame the scope of the issue and identifies key subgroups that may need to be targeted.

In addition, the National Center for Safe Routes to School (SRTS) has used NHTS to look at trends in walking and bicycling to school. The National Center for SRTS was established in 2006 through FHWA funding and serves as the clearinghouse for the Federal SRTS Program. In 2010, the National Center for SRTS issued a press release, *U.S. Travel Data Show Decline in Walking And Bicycling To School Has Stabilized*[24] that relied on findings from the 2009 NHTS.

3.2.1.2 NHTS Use for Legislative and Regulatory Purposes

NHTS data are also incorporated into Congressionally-mandated reports to inform reauthorization legislation or continuing resolutions for the surface transportation program. In this role, NHTS data are explicitly serving a legislative purpose. In the *Status of the Nation's Highways, Bridges and Transit: Conditions and Performance Report to Congress (C&P Report),*[7] for example, the NHTS is both a direct and indirect information source. This Congressionally-mandated report addresses the effects of past federal surface transportation funding and authorization bills. It is distributed to Congress and notably used in three Senate committees and one House committee. Through this document, NHTS is providing lawmakers with critical information on which to base future decisions regarding transportation in the U.S.

The first chapter of the report, "Household Travel," was written by the NHTS Program manager and presents the landscape of household travel in the U.S, including travel trends in the context of demographics, location, and overall changes in travel, such as declining vehicle miles traveled (VMT). The report also includes a discussion of NHTS findings with important policy implications, such as mobility issues for aging baby boomers and changes in travel behavior of the millennial generation. Other NHTS-related topics include changes in the household vehicle fleet, biking and pedestrian issues, transit, and an instructive discussion on potential NHTS inputs to land use planning and travel demand forecasting (e.g., trip rates, trip lengths, and trip purposes and characteristics). Indirect usage of the NHTS is also present throughout the C&P Report through models and calculations that use NHTS inputs. These models provide critical information used to determine levels of transportation funding, emissions standards, and fuel economy standards and are described in more detail in sections that follow.

NHTS data were also used in the *Transportation for Tomorrow: Report of the National Surface Transportation Policy and Revenue Study Commission,*[8] commissioned by Congress under the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) to examine the condition and future needs of the nation's surface transportation system and to assess alternative short- and long-term revenue sources for the Highway Trust Fund. The report was used by Congress as it considered reauthorization of SAFETEA-LU in 2009. The 2001 NHTS is represented in the *Transportation for Tomorrow Report*[9] as a primary data source used for seven briefing papers focused on informing the committee of the impact of demographic changes on passenger travel (Table 6). While Volpe cannot explicitly point to the impacts of these Reports on reauthorization, it is clear that these data were critical to understanding the transportation landscape and at a minimum served to inform legislators about key trends and issues in U.S. travel behavior.

Table 6. Commission briefing papers using NHTS data.

No.	Title	Description
1	*Analysis of Changing Relationships Among Population Growth, Passenger Travel Growth, and Vehicle Miles Traveled Growth for Different Modes*[25]	• Examination of current travel behavior and trends in the context of demographic factors to make predictions about future behavior.
2	*Implication of Aging Population on Passenger Travel Demand for Different Modes*[26]	• Future transportation implications of an aging population. • Projections of number of older drivers, vehicle miles traveled (VMT), pedestrian and traffic accidents, aging vehicle fleet, and suburban transportation needs.
3	*Implication of Alternative Assumptions Concerning Future Immigration on Travel Demand for Different Modes*[27]	• Implications of future immigration on travel demand as new immigrants exhibit different travel behaviors in terms of mode used (e.g., transit, pedestrian, and carpool).
4	*Implications of Regional Migration on Passenger Travel Demand*[28]	• Implications on travel demand (VMT) based on future migration. • South and West may see a disproportionate increase because of migration while other regions will level off or decline.
5	*Implications of Rural/Urban Development Patterns on Passenger Travel Demand*[29]	• Implications of population growth and distribution of the population (and jobs) among major cities, suburbs, and rural areas. • Impact of growth on travel demand and related services.

No.	Title	Description
6	*Implications of Rising Household Income on Passenger Travel Demand*(30)	• Examination of historical patterns, income, and related travel, considering that rising income may not affect travel as strongly in the future.
7	*Implications of Work and Nonwork Travel Patterns on Passenger Travel Demand*(31)	• Implications of the expected growth of nonwork travel relative to work travel and the impact on travel speed and other factors.

A leading transportation consultant interviewed for this evaluation described several cases where NHTS findings were delivered directly to transportation-focused Congressional committees through testimony. As Congress prepared for reauthorization of SAFETEA-LU, the consultant was invited to provide the committee with an overview of U.S. travel trends and patterns. The transportation consultant gave testimony prior to advocacy groups, so that the committee would have the appropriate context in which to frame what they would later hear from the advocacy groups. His testimony was based directly on NHTS findings. As the consultant explained:

> *"Without NHTS you are naked…you don't know what is going on with American travel behavior."*[14]

Other examples of Congressional testimony that reference NHTS include the following:

- *Testimony before the U.S. House of Representatives Committee on Transportation and Infrastructure Sub-Committee on Highways and Transit: Highway Trust Fund Viability 2007.*(32)
- *Testimony before the U.S. House of Representatives Committee on Appropriations Sub-committee on Transportation, Housing, and Urban Development and Related Agencies: Transportation and Housing Linkages 2007.*(33)

NHTS data are also used as an input to a key model that provides information (VM-1 Table) used to determine levels of transportation funding. More specifically, NHTS data on vehicle occupancy, in combination with Highway Performance Monitoring System (HPMS) data, fuel consumptions data, vehicle registration data, and data from other sources are used to develop vehicle miles traveled (VMT) calculations. This measure of VMT is key for highway planning and management and a common measure of roadway use. Along with other data, VMT is used in estimating potential gas-tax revenues through the Highway Trust Fund, as well as congestion and air quality.

With respect to regulatory uses, NHTS inputs are also integral to the calculation of the model year Corporate Average Fuel Economy (CAFÉ) standards(10) and are used specifically to provide forecasts of personal VMT and to provide information on the household vehicle fleet (e.g., type, age, and vehicle occupancy). By contributing to the development of these regulations, NHTS data plays an important role. All vehicle manufacturers must comply with the CAFÉ standards,[15] which serve to reduce energy consumption by increasing the fuel economy of cars and light trucks. In 2012, the White House highlighted the new standards that were issued, the significance of which was expressed by President Obama: "These fuel standards represent the single most important step we've ever taken to reduce our dependence on foreign oil."

[14]Transportation Consultant, phone interview conducted by Margaret Petrella (Volpe) and Lora Chajka-Cadin (Volpe). April 2015.

[15]The 2007 Energy Independence and Security Act (EISA), requires that the US DOT establish CAFE standards separately for passenger cars and light trucks each model year.

3.2.1.3 *Advocacy Groups and Nonprofits*

In addition to its use by government agencies, NHTS is widely used by consultants and organizations outside of government. Nonprofits and advocacy groups, for example, use the NHTS to educate the public, inform decisionmakers, and to advocate for their legislative and policy agendas. This section highlights some of the research being conducted by the American Association of State Highway and Transportation Officials (AASHTO), American Automobile Association Traffic Safety Foundation (AAATFS), and the American Association of Retired People (AARP).

AASHTO, a nonprofit, nonpartisan association representing State highway and transportation departments, has used NHTS data in its *Commuting in America* report, a series of briefs that describe commuting patterns and trends in the U.S. While the primary data source for this report is the *American Community Survey*, NHTS data are added to provide information on how work-related travel fits in with the rest of daily travel, presenting a more complete picture of commuting. As one interviewee explained:

> *"NHTS data needs to be used to give strength to the Census data; the two complement each other– one is fat where the other is thin."*[16]

Commuting in America is distributed to every member of Congress and their staff, and all State Secretaries of Transportation and their staff for use in transportation-related decisions.

Another nonprofit, AAAFTS, which conducts research to address growing highway safety issues, also has relied on NHTS data to shed light on risks associated with driving. More specifically, these analyses used NHTS data on number of miles driven, number of trips, demographic characteristics (age and gender), and vehicle occupancy. Two research projects are summarized in Table 7.

Table 7. AAAFTS project examples using NHTS data.

Document	Description
Teen Driver Risk in Relation to Age and Number of Passengers(34)	• Provide a measure of exposure to risk (e.g., miles driven) among different subgroups by computing crash rates per mile in relation to age/gender. • Quantify teenage drivers' relative risk of crash involvement per mile driven in relation to the presence, number, and age of passengers in the vehicle.
Risks Older Drivers Pose to Themselves and Other Road Users(35)	• Explore the risks that drivers pose to themselves and to others (e.g., passengers or occupants of other vehicles) on a per-driver, per-trip, and per-mile basis.

As an input to these risk analyses, NHTS data serve an important role. Through providing a more detailed understanding of the risks associated with teen and older drivers, this research helps identify the nature of the risk among different population subgroups, and these results can be used to develop specific polices or laws that will mitigate those risks.

[16]Transportation Consultant, phone interview conducted by Margaret Petrella (Volpe) and Lora Chajka-Cadin (Volpe). April 2015.

The AARP also has used the NHTS extensively as a source of information for research on transportation issues affecting older Americans. The AARP even purchased an Add-on sample from the 2009 NHTS to have more robust data on this topic. Table 8 lists several examples of research sourcing NHTS data. This research contributes to a better understanding of the transportation needs of older Americans and policies or laws that may be needed to support this population.

Table 8. AARP project examples using NHTS data.

Document	Description
Transportation Funding Reform: Equity Considerations for Older Americans[36]	Presents the case for the government to expand, improve, and enhance a wide range of transportation facilities and services that meet the needs of older people.
Aging in Plac3[37]	Compares the U.S. to other countries on those age 65+ in America traveling by foot or bicycle.
Impact of Baby Boomers on U.S. Travel, 1969 to 2009[38]	Discusses the impact aging Baby Boomers having on travel, including declining vehicle miles traveled.
T 4 America. Dangerous by Design, Study without Options[39]	Issues and impacts of the largest number of Americans 65+ living in the suburbs.

Recently the AARP's Government Relations and Advocacy group supported the passage of a Livable Communities Act to coordinate policies and investments to develop communities that accommodate the housing and transportation needs of older persons. In a letter to the Senate Committee urging passage of the Livable Communities Act, AARP referenced the 2009 NHTS, providing data on the percentage of seniors who drive. In addition, NHTS inputs on walking trips have been used to develop the AARPs Livability Index, an online tool that assesses seven broad categories of community livability: housing, neighborhood, transportation, environment, health, engagement, and opportunity. The Livability Index helps users better understand their communities and make decisions about future needs.

3.2.1.4 Technology and Policy Innovation

As described in this previous evaluation topic, the breadth and depth of NHTS Use, academics and consultants use the NHTS data to address a wide range of questions. These research topics are often directly linked to policy initiatives and are useful in providing context or understanding. This can be particularly important for research on innovative technologies.

Research being conducted at the University of Michigan, for example, used NHTS data to explore the impacts of self-driving vehicles on vehicle ownership.[40] The researchers found the potential for reduced vehicle ownership within households based on sharing of completely self-driving vehicles that employ a "return-to home" mode. As the DOT continues to focus on Automation,[17] NHTS enables research that contributes to our understanding of what to expect in a world of self-driving vehicles, and it provides decisionmakers with important information on which to base future policies in this area.

[17]Advancing Automation is a central priority in the 2015–2019 Intelligent Transportation Systems (ITS) Strategic Plan developed by the ITS Joint Program, and self-driving vehicles are also featured in the Secretary's *Beyond Traffic: 30 Year Outlook* report.

In addition, there has been a significant growth in the use of NHTS data to explore issues related to electric vehicles. Papers cover a variety of topics within this area, including 1) the design and performance of charging facilities, as well as their impact on land use decisions;[41] 2) charging technology, including storage (e.g., fuel cells and batteries) and use of renewable energy;[42] and 3) understanding electric vehicle feasibility and needed improvements to meet forecasted demand.[43] With DOT's growing emphasis on sustainability, and with policy initiatives such as the Department of Energy's SmartGrid, this research plays an important role in informing the national conversation on electric vehicles and their feasibility.

3.2.1.5 Use of NHTS in the Media

The media, as well as public and private sector journals, have covered a range of issues that highlight NHTS findings, including the growth of biking and walking, changes in commuting patterns, shopping patterns, and transit use, and more recently, the impact of self-driving vehicles on vehicle ownership. The media outlets covering these stories reach a national audience and include *USA Today,*[44] *Bloomberg News,*[45] *The New York Times,*[46] *The Washington Post,*[47] *Atlanta Journal Constitution*,[48] *The Denver Post,*[49] and *St Louis Post Dispatch*[50] to name a few. NHTS data findings are reported by foreign media outlets.

The media can serve as another channel through which NHTS findings make their way to decisionmakers, and these stories can help to set the agenda, calling attention to certain issues or topics. The FHWA Public Relations Office receives two to three requests for information per week, on average, from the media. As the Public Relations Officer explained:

> *"Of the many data sources made available to the public by the FHWA, the National Household Travel Survey is among the most highly requested by reporters writing about changes in America's transportation habits–from the rise of elderly drivers, to the growth of multiple, short trips (compared to longer "trip-chaining" trips), to the rise of bike riding and walking, to the decline of teens seeking their driver's licenses at 16. The data run the gamut, which explains their utility to news reporters."*[18]

3.2.2 Use of NHTS in Policymaking in Nontransportation Fields

Several Federal agencies including the Energy Information Administration (EIA) and Environmental Protection Agency (EPA) use data from the NHTS as inputs to models and in the calculation of policy-related statistics. These sources provide information to policy and decisionmakers that impact energy and environmental policy. Models may also be used at State or region levels to provide information in compliance with Federal and State regulations. Other agencies such as the Centers for Disease Control (CDC) use findings that are solely available in the NHTS to inform health initiatives, which in turn facilitate the development of health-related programs.

The EIA uses NHTS data to calculate energy-related statistics and has used these data in a number of its reports, including its *Annual Energy Outlook*. NHTS-derived VMT and household vehicle data are combined with data from the EIA and EPA on fuel economy and fuel price to derive vehicle fuel consumption and vehicle fuel expenditures. These statistics are used extensively by policy and decisionmakers to understand economic and environmental impacts of changing travel demand. For example, EIA uses these data to respond to specific requests from members of Congress to assess the impacts of proposed energy legislation.

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[18]FHWA Staff, in-person interview conducted by Margaret Petrella (Volpe) and Lora Chajka-Cadin (Volpe). March 2015.

EPA uses NHTS data, specifically VMT, number of vehicles, and fleet information (e.g., age) to develop default model data that can be used in its Motor Vehicle Emissions Simulator (MOVES),[51] an emission-modeling system that estimates emissions for mobile sources. While agencies are expected to upload their own data to the model in order to customize the results to their specific geographic area, this default data can be used in cases where States or regions do not collect their own data. States are required to provide EPA with emissions data as part of their State Implementation Plan, and MPOs in nonattainment areas must report on emissions to ensure the region is meeting conformity and air quality goals. In this way, NHTS data are helping States and MPOs meet their reporting and planning requirements.

In the health arena, NHTS data on walking and bicycling are used to spotlight the importance of physical activity to good health. A CDC official expressed the importance of the NHTS data as follows:

> *"The NHTS travel diary is unique in that it provides trip data by mode, length, and purpose—unlike any national health survey. For public health, this data allows a more detailed analysis of travel behavior, especially of active transportation (walking, bicycling, and, by some definitions, transit use) which, in turn, is known to be associated with an active and healthy life."*[19]

Table 9 presents several key examples of the use or potential use of NHTS data in the health field, including the *Surgeon General's Call to Action to Promote Walking and Walkable Communities, Healthy People 2020,*[11] part of The Department of Health and Human Services' 10-year agenda, and the White House Task Force on Childhood Obesity.[52]. These examples demonstrate how NHTS data are being used to benchmark progress on health goals and to encourage the development of policies and programs that will advance the nation's health priorities. In its *Report to the President*, for example, the White House Task Force on Childhood Obesity[52] makes specific policy recommendations for how to reach its goals, including enhancing Safe Routes to School Programs and reauthorizing a Surface Transportation Act that improves livability and encourages physical activity by adopting "Complete Streets" principles (e.g., new and improvement construction projects to accommodate bicyclists and walkers). NHTS data help lay the groundwork for these types of policy recommendations.

[19]CDC Researcher, email follow-up to phone interview conducted by Margaret Petrella (Volpe). April 2015.

Table 9. Health field use of NHTS data.

Document	NHTS Data use	Purpose
Step It Up! The Surgeon General's Call To Action To Promote Walking And Walkable Communities[12]	• Identifies NHTS as one of the data sources for surveillance of active transportation.	• Stimulate action nationwide to solve a major public health problem by promoting walking and walkable communities.
Morbidity and Mortality Weekly Report: Active Transportation Surveillance — United States, 1999–2012[53]	• Referenced as a potential system to monitor certain types of physical activity (e.g., walking and bicycling).	• Use five surveillance systems (one of which includes NHTS) to assess one or more components of active transportation. • Help public health and transportation professionals monitor population participation in active transportation. • Use data findings to plan and evaluate interventions that influence active transportation.
Vital Signs on Walking[54]	• Length of walking trips, by different trip purposes.	• Provide information on one of the CDC's "Winnable Battles," an issue with a significant impact on health and known effective strategies to address it.
The White House Task Force on Childhood Obesity Report to the President, Solving the Problem of Childhood Obesity within a Generation[52]	• Bike and walk trips to school (used as a baseline measure of "How Kids Get to School," and set the goal of increasing by 50% (by 2015) the percentage of children who take walking and biking trips to school.)]	• Serve as a call to action with specific recommendations for addressing obesity as well as benchmarks of success.
Healthy People 2020[11]	• Biking and walking trips (used to provide a baseline measure and performance targets).	• Outlines the Department of Health and Human Services' 10-year agenda, providing national guidelines for public health. • Used by health agencies in developing and prioritizing their programs.

In addition to the research related to physical activity, NHTS offers the opportunity to research other important public health issues. As the CDC official noted:

> *"Travel behavior and active transportation also intersect with public health through factors such as air quality, safety, access to care, etc., making NHTS valuable in examining those connections."*[20]

3.2.3 State and Local Use of NHTS Data for Planning, Policy, and Project Decisionmaking

In addition to informing Federal policy and rulemaking, there are examples where NHTS data, particularly the Add-on sample, has been used to inform planning as well as policy and project development within State and local governments.

[20]CDC Researcher, email follow-up to phone interview conducted by Margaret Petrella (Volpe). April 2015.

3.2.3.1 *State and Local Transportation Policy and Planning*

The NHTS data are used by numerous States and MPOs in developing, calibrating, or validating travel demand models that directly inform State or local policy and planning decisions. As one Add-on partner stated:

> *"Models are the only quantifiable source for transportation planning decisionmaking—NHTS is a must-have input to the models. All planning efforts are based on regional transportation models."*[21]

Others use the State and local results (from the Add-on sample) directly to research State issues. Table 10 highlights a few examples of NHTS data use by States and MPOs for travel demand and travel planning purposes.

Table 10. State/MPO NHTS use for travel demand models and travel planning.[22]

State	NHTS use	Purpose
New York	• Add-on data reports (county level analysis). • Validation of State travel demand models. • Research on custom issues.	• NY transportation department uses data to validate the travel demand model, which informs State projects and programs. • Results used directly by MPOs for long-range planning. • Research on origin-destination flow to assess employment related travel. • Research on proximity to transit and related travel behavior.
Iowa	• Data on trip rates and trip making characteristics are inputs to State and MPO travel demand models.	• State and county level models used for transportation planning decisions.
Ohio, Kentucky, Indiana MPO (OKI)	• Do not have MPO data. • Use NHTS to "borrow" data from similar regions in neighboring States to create trip rates for MPO travel demand model.	• The model is used by Ohio transportation department and MPO for long-range planning. • MPO model also used as an input to the Ohio transportation department Certified Traffic Forecasts (provides input for projects).
Atlanta Regional Commission	• Data from GA State Add-on sample used to benchmark MPO travel survey.	• MPO travel survey used for regional planning decisions.
North Central Texas Council of Governments	• Regional MPO researching use of TX State Add-on data to: • Integrate into travel demand model. • Look at trends from past MPO travel survey to present.	• Support regional transportation planning.
Maricopa Association Governments(55)	• NHTS Add-on sample used for travel demand model estimation and calibration.	• Informed MAG's Regional Transportation Plan.

[21]NHTS Add-on Partner, phone interview conducted by Margaret Petrella (Volpe). April 2015.
[22]Information obtained through interviews with the evaluation team.

3.2.3.2 *Environmental and Energy Policy and Regulations*

As previously described in Section 3.2.2, NHTS data are used by States and MPOs as one input to the MOVES model to estimate emissions. The results from these models enable States and MPOs to meet reporting requirements as specified in the Clean Air Act (CAA) (56). While Volpe does not know the extent to which NHTS data serves as an input to these air quality reports, several Add-on partners mentioned that NHTS serves this valuable function. In Vermont, Volpe found evidence of NHTS data being used to inform energy-related issues at the State level.

Table 11. State/MPO NHTS use for environmental and energy planning.[23]

State	NHTS use	Purpose
Ohio, Kentucky, Indiana MPO	Regional travel demand model (see Table 11).	• Future travel conditions from model feed into air quality reporting as required by State and Federal EPA. • EPA MOVES software used for these forecasts.
Vermont	Daily travel demand and trip generation.	• Estimate transportation energy use in the State and forecast electric vehicle travel demand and its likely adoption within the State. • Data used as a basis for planning the placement of charging facilities throughout the State.

3.2.3.3 *NHTS Use in the National Cooperative Highway Research Program (NCHRP)*

Through its mission to address transportation issues integral to the State transportation departments, MPOs, and local governments, the NCHRP has developed guidebooks and reports to assist communities in multiple aspects of transportation planning. The NHTS is often a source of information used to develop the guidebooks as well as a source of data recommended to implement the transportation planning forecasts and techniques. These guidebooks are used to inform policy and projects at the regional, corridor, or project level.

[23]Information obtained through interviews with the evaluation team.

Table 12. NCHRP reports using NHTS data.

Document	Examples of NHTS Data Use	Purpose
NCHRP 716 Travel Demand Forecasting: Parameters and Technique[57]	• Use transferable parameters from the NHTS in the development of travel model components when local data are insufficient or unavailable. • Check the reasonableness of model outputs (e.g., validation and calibration).	• Provide guidance on travel demand forecasting procedures and their application for solving common transportation problems. • Provide information on developing travel models.
NCHRP 770 Estimating Bicycling and Walking for Planning and Project Development: A Guidebook[58]	• Includes transferable methods to estimate and forecast bicycling and walking. • NHTS data includes walking, biking, transit trips; VMT/PMT; mode share; Distance traveled by bike; biker characteristics; and vehicle ownership.	• Provide information on estimating and forecasting bicycling and walking activity. • Multiple modeling approaches reviewed and compared.
NCHRP 758 Trip Generation Rates for Transportation Impact Analyses of Infill Developments[59]	• Use of NHTS (or other travel survey data) to calculate trip generation rates used to compare to/adjust ITE published rates for Infill Development. • NHTS data includes trip purpose/land use, mode, and trip characteristics.	• Describe an easily applied methodology using travel survey data to prepare and review site-specific transportation impact analyses of infill development projects located within higher-density urban and suburban areas.

3.2.3.4 Project Selection and/or Modification

In trying to identify project level impacts of the NHTS data, Volpe primarily relied on its interviews with State and MPO contacts, as well as a literature review of State and local applications of the NHTS data. Based on these methods, Volpe found a range of examples in which NHTS data was used to inform transportation-related project selection or modification. In some cases, the data confirmed the need for a project (e.g., based on travel demand data) or enabled the State or MPO to prioritize projects. As one interview noted,

> *"We get lists of projects and funding is limited, so we use survey data to help us decide if investment in a project is worth it—the data may tip the balance of the scale one way or the other."*[24]

Examples are summarized in Table 13.

[24]NHTS Add-on Partner, phone interview conducted by Margaret Petrella (Volpe). April 2015.

Table 13. State/MPO NHTS data use for project selection or modification.[25]

State	NHTS Use	Example Project
Ohio, Kentucky, Indiana MPO (OKI)	NHTS Add-on data used.	Ohio transportation department's Brent Spence Bridge Project (Ohio River) used future traffic volumes calculated using the MPO travel demand model in the project design process.
Atlanta Regional Commission	State Add-on data used in conjunction with MPO survey data.	Used Add-on data to look at trip-making behavior in areas of concern; the data reinforces decisionmaking and helps prioritize project selection. • **Transit Project:** NHTS data helped identify whether there was a need to re-route buses in the downtown area. • **Park and Ride:** NHTS data supported decisions on where to invest in Park and Ride lots.
Iowa	Data on trip rate and trip-making characteristics used as inputs to travel demand models.	Using the model can assess impacts of proposed projects on trip rates in the area. • **Interchange project.** Travel demand model used to assess several design scenarios for project. Model provided trip rates and congestion levels for scenario comparison (e.g., build vs. no-build). • **Corridor level projects:** Similarly, for corridor level projects, such as capacity expansions, the travel demand model can assess impacts of the project on trip rates. • **Passenger Rail:** Used NHTS to look at commute trip origin/destination patterns between Chicago, Iowa, and Omaha to assess potential for rail travel.
California[60]	Data on trip purpose, mode share, characteristics of households, and safety attitudes used; geographic analysis was also conducted.	Used NHTS California Add-on data on behavior and trends to identify barriers to pedestrian and bicycle travel; results enabled State to tackle these "low hanging" issues.
Florida[61]	National and Add-on sample used, including data on trip purpose, and personal, household, and travel characteristics.	Assessed transit markets in Florida, as well as U.S., from five perspectives: market size, modal share, attitudes, socio-demographics. and trip characteristics. Results can be used by transit agencies for strategic planning and more generally to develop policies and fund programs for those who are transportation and economically disadvantaged.

[25]Information obtained through interviews with evaluation team.

The interviews and literature search did not reveal any specific examples in which NHTS data informed a nontransportation-related project. Nonetheless, Volpe expects that there may be cases where NHTS did serve this role. For example, NHTS data forms the basis for several of the Physical Activity objectives presented in Healthy People 2020[11] (Section 3.2.2), and through the interviews, Volpe heard that the goals and objectives outlined in Healthy People 2020 provide agencies and organizations with funding opportunities and help guide the development of their projects and programs.

3.3 NHTS Responsiveness to its User Community

The success of the NHTS Program depends on its ability to meet the needs of its user community. The degree to which the NHTS interacts with and solicits feedback from the community reflects its responsiveness. This section focuses on documenting the different ways in which NHTS has collected information from its user community and how this feedback has led to changes in the program.

The evaluation questions used to assess how responsive the NHTS team is to its user community included the following:

- To what extent does NHTS use multiple methods to solicit feedback from its user community?
- Does NHTS continuously reach out to its user community?
- In what ways has NHTS made changes based on user feedback:
  - To its outreach (e.g., tools, publications, etc.)?
  - To its 2016 survey?

The NHTS receives extensive feedback from its user community through direct user support, outreach activities, and the NHTS task force. An Expert Panel has also been convened to provide input on the upcoming 2016 survey. These channels have provided the NHTS with direction in planning of the NHTS, the development of user tools, and in the creation of reports and presentations. The following section of the Report summarizes findings on the different mechanisms that NHTS uses to collect user input, the frequency with which it uses the methods, and changes that NHTS has made based on input from its user community.

3.3.1 Direct User Support

NHTS provides continuous support to its users through its website (www.nhts.ornl.gov), where it houses the datasets, user guidance documents, publications, and analysis tools. The NHTS also uses the website to keep its users updated on any news related to the survey.

FHWA receives ongoing feedback from users who contact FHWA Public Affairs or the NHTS staff directly for assistance. The NHTS team fields 2–4 data requests per week and fields user questions received by email or phone on an ongoing basis. Data analysts at Oak Ridge National Laboratory (ORNL) are also available to support users with more challenging data requests or data usage questions.

In each of the interviews, respondents were asked to comment on NHTS responsiveness to its user community. Overall, the response was extremely positive. As one interviewee stated:

> *"Overall, they do a great job of supporting users and provide service to all without fee."*[26]

Another user indicated the following:

> *"Any time I have questions, Adella and her team are there to answer the questions."*[27]

Lead users and task force members all describe a very collaborative relationship with the NHTS staff. As one lead user explained:

> *"NHTS appreciated and incorporated the [task force] feedback. One change made as a result of feedback obtained by [the] task force—NHTS created a differential for weekday data to meet needs of Add-ons."* [28]

In another example of the collaboration that exists between NHTS and its user community, a lead user commented that when his team found anomalies in the 2009 data, NHTS pulled, investigated, and reweighted the data based on the user's feedback.

Several interviewees noted that resource constraints limit the amount of outreach that can be performed.

> *"NHTS is very constrained in resources—things like webinars [and] training modules can be done with [a] relatively modest budget, but [it is] hard to do a lot more outreach."*[29]
>
> *"Given constraints NHTS Program office operates under, they do a good job updating the user community."*[30]

In addition, another user would like to see a more formal means of communicating survey needs.

> *"What's missing is a mechanism for users to make their needs known – need a situation where people feel they can describe their data needs and NHTS will a) understand, and b) act on it."*[31]

The NHTS Program Manager also acknowledged that there are many demands on the NHTS survey, but the survey has "limited real estate." In making decisions on what new content to add, the Program Manager uses input from the user community, but is also guided by the priorities of the Office of the Secretary, TRB programming, topics in the media, as well as other sources. According to the Program Manager, she is, "always listening and tuning into key policy issues of the day."

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[26]Transportation Consultant, phone interview conducted by Lora Chajka-Cadin (Volpe). March 2015.
[27]NHTS Add-on Partner, phone interview conducted by Lora Chajka-Cadin (Volpe). May 2015.
[28]Transportation Consultant, phone interview conducted by Lora Chajka-Cadin (Volpe). May 2015.
[29]Academic, phone interview conducted by Margaret Petrella (Volpe). April 2015.
[30]Transportation Consultant, phone interview conducted by Lora Chajka-Cadin (Volpe). May 2015.
[31]Transportation Consultant, phone interview conducted by Margaret Petrella (Volpe) and Lora Chajka-Cadin (Volpe). April 2015.

3.3.2 Outreach Activities

On an informal level, the NHTS Program Manager reaches out to agencies across the government to understand the ways in which the NHTS data might serve their needs. For example, there has been a brown bag lunch with HUD and meetings with the EIA and CDC. As another mechanism of sharing insights and gathering input, the NHTS holds formal conferences and workshops for its users shortly after the NHTS data have been released. Two key examples include the following:

- Using National Household Travel Survey Data for Transportation Decisionmaking—Workshop (June 2011).
- Data for Understanding Our Nation's Travel: National Household Travel Survey Conference (November 2004).

For the two-day workshop convened in 2011, more than 60 presentations using NHTS were given, along with 22 posters. This workshop offered users the opportunity to share insights, issues, or challenges in using the NHTS data.

Other key outreach activities include presentations and panel sessions at the annual meeting of TRB, as well as updates to key TRB committees (e.g., Travel Survey Methods Committee). These outreach activities provide the opportunity for the NHTS user community to share how they use of the NHTS data, while also providing feedback on the survey methodology, dataset, and analysis tools. Table 14 lists major NHTS outreach activities in the last 11 years.

Table 14. 15-year review of formal NHTS outreach activities.

Outreach Type	Title	Date
Annual TRB Meeting	Session 302: Innovative Analysis of National Household Transportation Survey Session 602: Panel, Continuous, and Cross-Sectional Travel Surveys: Lessons Learned and Successes Achieved Session 799: Data Needs for the Future—The Big Picture	January 2015
Annual TRB Meeting	Session 197: Planning for 2015 National Household Travel Survey Session 244: Travel Characteristics Past, Present, and Future: Communicating Information Derived from National Household Travel Survey, Part 1 Session 384: Travel Characteristics Past, Present, and Future: *Communicating Information Derived from National Household Travel Survey, Part 2*	January 2014
Annual TRB Meeting	Session 190: The Future of National Household Travel Data: Getting Feedback from the User Community	January 2013
Annual TRB Meeting	Session 339: Turning Past Experience into Future Plans for the National Household Travel Survey	January 2012
Workshop	Using National Household Travel Survey Data for Transportation Decision Making	June 2011
Annual TRB Meeting	Session 181: National Household Travel Survey: data Tools and Overview of Trends	January 2011
Annual TRB Meeting	Session 710: National Household Travel Survey: Data Applications, Tools, and Analyses Session 720: Emerging Issues and National Household Travel Survey Data Applications	January 2010
Annual TRB Meeting	Session 790: National Household Travel Survey, 2008: Add-on Applications, Data Use, and Dissemination	January 2009
Annual TRB Meeting	Session 119: Application of Passenger Travel Data for National, State, and Local Congestion Performance Measurement	January 2008
Annual TRB Meeting	Session 380: Showcase of Nationwide Personal Transportation Survey and National Household Travel Survey Data Analyses and Applications	January 2007
Annual TRB Meeting	Session 394: National Data Requirements and Programs: What Do We Have? What Do We Need?	January 2006
Annual TRB Meeting	Session 383: Data Needs and Sources for Nonautomobile Modes: Emerging Technologies for Nonmotorized and Two-Wheeled Vehicles	January 2005
Annual TRB Meeting	Session 732: Travel Behavior Trends from 2001 National Household Travel Survey	January 2004
Conference	Data for Understanding Our Nation's Travel: National Household Travel Survey Conference (Transportation Research Circular Number E-C071)	November 2004

Recently, the NHTS team has added regional workshops with current and potential Add-on partners to their outreach activities. These workshops allow MPOs, State transportation departments and other groups to share their needs and concerns with the Add-on portions of the NHTS. For example, NHTS staff traveled to Colorado and Arkansas to hear about their concerns and understand their needs with regard to the survey.

In addition, FHWA has contracted the services of a consulting firm, Battelle Memorial Institute, to help States and MPOs assess their data needs and whether or not the NHTS is an appropriate vehicle to answer their questions (regardless of whether or not the State or MPO is an Add-on partner). The contractor provides methodology support, helping States and MPOs determine necessary sample sizes based on the analysis they plan to conduct. For example, Battelle held several conference call meetings with the Arizona Add-on partner to discuss their objectives in joining the NHTS and sample size appropriateness to capture those objectives. Battelle then ran computation exercises using the 2009 data and provided Arizona with a couple of different scenarios for how it might allocate its sample across counties to meet its objectives.

3.3.3 NHTS Task Force

More recently, a central part of NHTS outreach has been the NHTS task force. In 2011, the NHTS Program developed the task force to bring the user perspective to the NHTS as it prepared for its next survey. The task force serves as a bridge between FHWA (NHTS team) and the NHTS user community by soliciting input from users and facilitating discussions with them. The NHTS Program Manager meets monthly with members of the NHTS task force to obtain updates on their activities.

The objective of the NHTS task force was to understand how the NHTS community uses NHTS data and how potential survey modifications would impact the community. Through sessions and workshops at TRB, user forums at other transportation research events, a user survey, and phone calls with the user community, the 22-member Task Force gained an understanding of the needs and experiences of this community.

In October 2013, the NHTS task force presented its phase 1 findings in the *Transportation Research Circular E-C178*. Although no formal recommendations were made by the task force, its findings provided detailed user feedback on the previous NHTS and data needs for future NHTS. The circular provided data on themes including the following:

- How NHTS data are used.
- How well NHTS data meet user needs.
- Additional data desired for next NHTS/additional data needs.
- Sampling and under-represented population groups.
- Survey frequency.

3.3.3.1 Summary of Task Force Findings

The NHTS task force found that NHTS is widely used for a variety of purposes by many different user groups. Needs of users differ widely, but there is extensive need for national trend analysis. NHTS fulfills its mission as a nationally representative survey of travel behavior, but it falls short of what many users would like, including the following:

- Many users would like the NHTS to be conducted more frequently.
- Users have concerns that the RDD sample no longer accurately represents U.S. households (oversamples elderly, under samples young, omits cellphone-only households).
- NHTS data are used for a wide variety of purposes by many different user groups; some groups' needs are met while others feel that the data falls short of delivering what they need.
  - Likes include that data are easy to use and available in multiple formats.
  - Dislikes, especially among modelers, were inclusion of weekend and holiday data in sample (leading to smaller effective sample), and missing data from some household members.
- Users are increasingly interested in statistically valid data of more detailed geographies, including MPOs and rural areas.
- Users would like the next NHTS to take advantage of technical advances in survey sampling, design, and data collection (e.g., GPS data), but also want comparability with previous surveys.
- Users need more help translating data into useful information. Additional and more flexible tools are desired and information on how to fuse with other datasets.

The findings also note that the NHTS may not be reaching all its potential users and that its value could be increased with better guidance on how to fuse it with other standard data sets.

3.3.4 Changes to the NHTS

The NHTS Program has enhanced its website and its online tools based directly on feedback from its user community. Questions and data requests from the user community are often the basis for the NHTS website's FAQs. For example, in 2011, NHTS issued FAQs detailing Urban-Rural Designations and Trip Purpose (variables in the dataset), because of questions on these topics from the user community. User feedback led to the development of online analysis tools such as the Table Designer and Data Extraction Tools. These tools allow users to access multiple years of data at any time. User requests and feedback also inform the topics selected for briefs, reports, and the pre-loaded tables that are included on the website.

In addition, the development of the NHTS Academy is based on feedback from the user community. During a task force event in Dallas Texas, the Chief of Travel Monitoring and Surveys Division learned that NHTS users wanted "self-paced learning tools." In response to this request, the NHTS team developed the NHTS Academy—a series of short informational videos designed to help the user community understand and make better use of the NHTS data. The NHTS designs modules that are based on recurring issues or problems among its users.

Based on the task force findings and input from the broader user community, the NHTS has also made significant changes to the methodology for its upcoming 2016 survey.[32] There was concern that the 2009 NHTS was over-representing the elderly and did not include younger, cell-phone only households, so the methodology has been updated to better represent U.S. households, with the objectives of maximizing response and minimizing bias. Key changes to the survey include the following:

- Move from RDD sample to an Address-Based Sample.
- Conduct recruiting using a mail out/mail back method (rather than CATI).
- Provide mail, phone, and email reminders to recruits to encourage response.

In response to complaints of missing data from family members, make the following changes:

- Change retrieval of travel diary data to web retrieval survey (instead of CATI), with option to complete by phone (with interviewer using web survey).
- Provide diaries for each household member.

In response to the greater use of activity-based modelling in the user community, the NHTS survey is being redesigned to collect activities at each stop. Based on Add-on members' complaints about having to pay for unwanted weekend and holiday data, Add-on participants will have the option to collect only one day of sample over weekend travel instead of two days of weekend sample.

3.3.5 Expert Review Panel(62)

In developing its survey methodology for the 2016 survey, NHTS convened a panel of survey research experts to obtain their input and review. The first panel meeting was held in March 2014. NHTS summarized the findings from the panel in detailed notes. The panel met again in April 2015 to provide input on all aspects of the methodology. NHTS is using the feedback from the expert panel to inform its decisions about the administration of the 2016 survey.

3.4 Challenges and Lessons Learned

Challenges and lessons learned were documented in reference to the overall NHTS Program as well as the Add-on program. Findings for each are presented in this section.

3.4.1 NHTS Program

Challenges and lessons learned regarding the NHTS Program are based on data gathered during the interviews. Specific questions were included in the discussion guides for the current and previous program managers, as well as for the Chief of the Travel Monitoring and Surveys Division. Lead users, while not prompted, still mentioned challenges, as well as suggestions for how to address those challenges. Their responses are included in the findings.

[32]The changes to the 2016 survey presented in this section are the NHTS proposed changes, which are currently under review at the Office of Management and Budget. A summary of final changes may not be ready until November or December 2015.

Interviewees were asked to comment on challenges and lessons learned in three areas:

- Survey planning process.
- Survey administration and oversight.
- Outreach.

3.4.1.1 Survey Planning Process

Interviewees identified several challenges and lessons learned regarding the NHTS planning process. Many saw funding as one of the biggest issues for survey planning. Specifically, the lack of institutionalized funding results in the NHTS being perceived as not a high priority. One lead user noted that "without consistent, stable funding the program cannot run in a systematic fashion." Other interviewees expressed concern that the lack of stable funding negatively affected States' use of the survey. For instance, one said that:

> *"Financial planning is critical. States will not come on board without funding."* [33]

Several interviewees suggested that there is a lack of resources (e.g., staffing) that additional funding could help support. On a similar note, one lead user expressed disappointment in having to defend something that "should be so obvious."

Several interviewees suggested that if the NHTS was conducted on a regular cycle with dedicated funding, it could be more effective. They noted that the irregularity of the survey and long lapses of time between surveys results in States perceiving the NHTS as unreliable. One interviewee said:

> *"NHTS has historical continuity; however, it will be 7.5 years since the last survey. [FHWA] will lose people if [they] can't provide data on a more regular basis." The unpredictable timing of the survey hinders Add-on partners' ability to count on when they will have their data, which affects a [State's] ability to participate as an Add-on altogether.* [34]

Others raised the concern that because technology is changing our travel behavior so rapidly, it is important to conduct the survey at more regular intervals in order to capture these changes in travel.

Another issue raised is related to the survey method design and content. An interviewee suggested that it will be challenging to determine how effective a web-based survey will be given the length and complexity of the NHTS. Furthermore, it is unclear how the changes in methods will impact the data, and hence the trends in travel behavior. (e.g., To what extent will NHTS be able to distinguish changes because of survey method from changes because of travel trends?) Another interviewee suggested that in the future:

> *"[There are] new and different ways of collecting data, e.g., credit cards and cell phones… NHTS needs to be on its game…needs to know when to change its methods and when to defend what they are doing."*[35]

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[33]FHWA Staff, phone interview conducted by Margaret Petrella (Volpe) and Lora Chajka-Cadin (Volpe). May 2015.

[34]Ibid.

[35]Academic, phone interview conducted by Margaret Petrella. April, 2015.

3.4.1.2 Survey Administration and Oversight

Interviewees discussed challenges and lessons learned regarding the NHTS administration and oversight process. One of interviewees commented on both monitoring progress and data cleaning, noting that:

> *"A great step forward was taken by Adella Santos in the 2009 NHTS, by requiring the creation of daily online updates on the status of the sample during the recruit and retrieval survey stages."*[36]

The interviewee indicated that there are plans with the 2016 survey to provide more information throughout the year-long survey field period to address "the quality, completeness, and coherence of the data," and that effort should be made to test the effectiveness of this monitoring. The same interviewee also noted that performing the data cleaning in a shorter amount of time is a challenge. Ideally, there would be less lag time between the end of data collection and publication of the public-use dataset.

Interviewees offered several recommendations for improving the administration and oversight of NHTS. Several of the key recommendations include the following:

- Develop NHTS into a family of surveys that would have some specialized data collection for issues such as long-distance travel, use of emerging modes (e.g., Uber and Lyft), and connections between travel behavior and health status.
- Consider linking NHTS data to supplemental data, such as cellphone locations.
- Strengthen relationships in the administration for sharing the uses of the data.
- Adopt a more systematic approach to post survey analysis. A lot of the data seemingly goes unanalyzed because people just use what they are interested in studying, rather than the entire dataset.

3.4.1.3 Outreach

Several challenges and lessons learned regarding effective NHTS outreach methods were raised in the interviews. A few interviewees commented on challenges in doing outreach and getting user input. Several users indicated that more outreach is needed to bring in the opinions of others, including those from nontransportation Federal communities.

Another user suggested that the task force should be more proactive in getting user input on the 2020 survey and added that that type of outreach should occur several years in advance of the survey. One user suggested that effective user outreach could help address the challenge of balancing new issues with core questions (i.e. trend data are very important, but travel behavior changes and new issues arise; NHTS needs to get rid of obsolete data and cover new phenomena). Several interviewees also identified resource constraints (e.g., staffing) as a cause for this lack of outreach. One interviewee noted that they:

> *"[NHTS] needs to have dedicated staff for outreach. [They] also need staff that is trained to analyze data."*[37]

[36]FHWA Staff, email correspondence, September 2015.
[37]Transportation Consultant, phone interview conducted by Margaret Petrella (Volpe), April 2015.

Another area of concern was the lack of outreach to and access of data for decisionmakers (i.e. policy makers). One user noted that:

> *"Congressional staff has an idea of what their data needs are but they can't articulate them."*[38]

Another emphasized the need to improve decisionmakers' access to NHTS data:

> *"Legislative staff wants the ability to go online and get information—recent information, quick and simple. They are not going to hunt around for what they are looking for; if it's not there, they are going to move on."*[39]

Furthermore, one user indicated that the NHTS staff does not always understand the policy audience.

Other interviewees identified some specific recommendations for improving outreach of NHTS, including the following:

- Need to brand NHTS data better so decisionmakers can really gauge its impact in addressing issues. It is often not cited properly, which makes it lose credit. This makes supporting future surveys in the NHTS more of a challenge.
- Need more training on the uses of NHTS data and for the Add-on programs. NHTS could provide webinars for the user community on various reasons why decisions were made (e.g., categorization of income levels, weighting and controlling measures, effects of change in survey methods, etc.). NHTS also could conduct more usage training sessions for internal State transportation offices. They need to conduct more external outreach efforts to more States, MPOs, and private entities for next NHTS.

3.4.2 Add-on Program

During the interviews, Add-on partners were asked to identify any challenges of the NHTS Add-on program. A summary of their responses is presented below. It should be noted that the views expressed only represent feedback from a relatively small number of States and MPOs and are not meant to be representative of the views of all Add-on partners.

When asked about challenges, a couple of Add-on partners mentioned a lack of communication between the States. Interviewees expressed a desire to see increased communication among the Add-ons to get a better sense of what other States are doing (e.g., what questions they are asking and can States and MPOs support each other as they collect data). For instance, one interviewee noted that a big "weakness is not having other States' data. In New York, a lot of the traffic goes out of State, but none of those States participate in the Add-on."

One suggestion was to consider creating a community of Add-ons (e.g., face-to-face meeting, listserv) to put them in touch with each other. Furthermore, there was some miscommunication between the regions and NHTS team in terms of what type of data the regions need. For example, in one case the regions were using Monday through Friday travel models, but the NHTS collected data based on seven day weeks. A significant amount of money ended up being spent covering days of the week that the State did not want. As mentioned above, lack of funding was identified as a barrier for getting more States on board.

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[38]Transportation Consultant, phone interview conducted by Margaret Petrella (Volpe) and Lora Chajka-Cadin (Volpe). April 2015.

[39]Senior Associate Consultant, phone interview conducted by Lora Chajka-Cadin (Volpe), May 2015.

Interviewees reinforced the importance of the survey being flexible. One interviewee referenced an example of how they could not get questions on tolling into the survey for Florida. Another interviewee indicated that States necessarily lose some flexibility and control when they become Add-on partners because they are not managing the survey nor can they make changes to the methods. However, he went on to say that NHTS is a "solid survey" that provides a good option for many States and MPOs, particularly smaller ones that may not have the resources or expertise to collect their own data. Another issue that was raised is that technology is rapidly changing, and the NHTS needs to adapt to those rapid changes in order to be successful. Interviewees recognized that the NHTS faces several constraints such as its limited funding and the need to negotiate with its consultants.

Other challenges included the need for more training and tools and improved quality of the survey. Two interviewees suggested that there need to be more tools to help States and MPOs more easily analyze the data, including tools for data visualization. This is particularly important for smaller States and MPOs that may not have staff with survey or statistical expertise. Another interviewee stated that the 2009 survey did not meet the expectations of Add-on partners. They suggested that the NHTS team needs to:

> *"…understand the objectives of Add-ons, set correct expectations for what Add-ons can do, provide updates during planning, and provide information and feedback during data collection and completion."*[40]

[40]Research Scientist, phone interview by Lora Chajka-Cadin (Volpe). March 2013.

4. Recommendations

The NHTS Program has been conducting travel surveys for 46 years and serves as the only source of data that links individual travel behavior with household and demographic information, travel-related attitudes, and vehicle characteristics. This evaluation found that the NHTS serves an important role in the decisionmaking process, but its impact could be greater. To further increase the value of the NHTS to FHWA and to its wider community of users, Volpe offers the following recommendations for FHWA's consideration.[41]

1. **Conduct the surveys on a more frequent and regular cycle.** The most recent NHTS data was collected approximately six years ago, in 2009, and as one interviewee mentioned, these data are "ancient" and "a lot has changed since then." Users would greatly value a more frequent data collection cycle, such as every three or five years. If the NHTS survey were on a regular cycle, adhering to a set schedule, users would know when to expect the data and they could plan accordingly. In particular, a regular cycle would make it easier for States and MPOs to participate as Add-on partners.

2. **Institutionalize adequate funding for the NHTS.** It is difficult to conduct the NHTS on a regular cycle because of uncertainty around funding. Several lead users indicated that since the NHTS is not mandated (i.e. there is no earmark in the budget), it has been a struggle to obtain sufficient funding. While FHWA was more proactive and successful in obtaining funds for the 2016 national survey, in previous years this has been a significant problem. In addition, the NHTS relies increasingly on funding from Add-on partners to support the survey design and data collection efforts. While the NHTS benefits from Add-on funding and increased sample, the Add-on partners are pushing for changes in terms of survey design and execution (e.g., more weekday sample, advanced technology use, etc.). While balancing the needs of the national survey and the Add-on partners has been well-managed thus far, providing additional funds for the NHTS would ensure that control of the survey remains with the FHWA. NHTS needs greater institutional support, in the form of both funding and staffing, to fulfill its mission. "Passing the hat," as one interviewee described the process, is not a successful strategy for sustaining the survey.

3. **Increase staffing.** A majority of those interviewed spoke to the need for more staff at the NHTS Program. Currently, staffing is "bare bones" and stretched very thin. The staff has limited time to conduct outreach, given the other activities that must be performed in preparing for the survey. Additional staff would also enable NHTS to plan for and conduct more indepth analysis of the data (beyond the Summary of Travel Trends and NHTS Briefs), thus giving FHWA greater ownership of the data. This might contribute to improved "branding" of the NHTS, broadening its reach and further increasing citations.

[41]The challenges and lessons learned described by interviewees provide the basis for several of the NHTS Program recommendations summarized in this section.

4. **Conduct more outreach.** NHTS has an established set of users who rely heavily on the NHTS data, but more outreach could be conducted to extend the reach of the program. Although limited in its resources, NHTS has taken steps in this direction; for example, the program manager has organized meetings with different Federal agencies to solicit their input and to understand their data needs. These efforts need to be expanded. For example, the NHTS Program should consider meeting with Congressional policy staff to increase awareness of the survey and the data that it provides. In turn, this would enable NHTS staff to learn more about the data needs of policymakers. At a minimum, NHTS should consider distributing its *Summary of Travel Trends* and *NHTS Briefs* to members of Congress and their staff. Greater outreach also could be conducted among Add-on partners, to solicit new partners and to ensure that current partners are having their needs met.

Based on the findings of this evaluation, Volpe also offers a few recommendations for tracking NHTS data use, so that the program might better demonstrate its value to decisionmakers.

1. **Continue to emphasize the importance of properly citing NHTS and consider new mechanisms for collecting reports, publications, and models that use NHTS.** The NHTS Program Manager has made it her mission to convey to users that they must cite the NHTS when they use the data. This message needs to be emphasized on a continuous basis. Currently, the NHTS Program uses Google to track publications that cite NHTS, and these publications are documented in its *Compendium of Uses.*(2) While this is an important tracking effort, it tends to uncover reports and publications that are academic in nature. Other efforts are needed to capture Federal, State/MPO, and local government use of NHTS. As part of its outreach efforts with these audiences, NHTS should stress the importance of gathering reports, publications, models, or other forecasting tools that use the NHTS data. Other ways to collect this information include the following:

    - Contact users via email on a quarterly basis to inquire about publications or reports (or other outputs) that use NHTS data, and then share innovative use stories via a newsletter.
    - Use the TRB annual meeting and mid-year meetings as an opportunity to gather this information.

2. **At the end of each year, develop a one-page brief that highlights findings from the Compendium.** As noted above, the Compendium is a useful tracking device, and NHTS should consider producing a one page brief that summarizes the Compendium. The brief could illustrate the range of topics being addressed in NHTS research, the array of author affiliations, and emerging topics. The brief would also be useful to demonstrate the widespread use of NHTS to FHWA leadership and other decisionmakers.

3. **Media requests and requests from government officials should be tracked in an accessible format.** Based on a discussion with the FHWA Public Affairs staff person, FHWA receives numerous requests from the media as well as from government officials. While these requests are saved, they should be tracked in an accessible format (e.g., Excel), so that this information can easily retrieved and summarized to provide evidence of the impact of NHTS data. These requests might also serve as a source for identifying additional reports and publications that use NHTS data.

4. **Better use of the website tracking information.** Pending available resources, more could be done with the website usage statistics to understand who the users are, what online resources they are accessing (e.g., user segments), and the extent to which new users are accessing the website each month, as compared to repeat users. This information might help NHTS better target its outreach to distinct user groups.

5. Conclusion

The findings demonstrate that NHTS data are widely used across a range of fields and across different levels of government. In addition to transportation, NHTS use extends to the fields of health, energy, and the environment. More than half of publications in the 2014 Compendium[1] had a primary application in one of these fields. And while the Compendium analysis revealed that nearly half of publications pertain to topics with a national focus, a sizeable share are international (30 percent) or have a State/regional focus (25 percent). Within transportation, the publications address a variety of topics, and in most cases, several topics are covered in a single publication. Frequently addressed topics across all fields include travel characteristics and behavior, policy and mobility, demographics, and travel trends.

The examination of NHTS-related documents also provides evidence on the diversity of the users. In the Compendium, a large majority of the publications are produced by academics (82 percent); however, the document reviews and interviews revealed that NHTS use is much more widespread. The lead presenters' analysis (TRB sessions, NHTS conferences/workshops, etc.) demonstrates a greater mix of NHTS users, as 41 percent are comprised of academics, 27 percent are Federal, 22 percent are contractors or consultants, and 7 percent are States/MPOs.

NHTS clearly informs decisionmaking, but it is difficult to identify the specific impact of NHTS, as policy proceedings and legislative hearings are not often transcribed and/or readily available, and oftentimes, the data sources (e.g., NHTS) for policies and legislation are not formally cited. Nonetheless, Volpe was able to identify cases illustrating that NHTS plays an important role in the decisionmaking process. In some cases, NHTS findings set the stage, providing context and understanding on different aspects of American travel behavior that feed into legislation and policy formation. NHTS data serve this function in the *Beyond Traffic Report*,[6] *The C & P Report,*[7] *The National Surface Transportation Policy and Revenue Study Commission Report*s, and Secretary Foxx's *Safer People, Safer Streets: Pedestrian and Bicycle Safety Initiative.*[23] Indeed, NHTS data have highlighted emerging issues for decisionmakers, such as the finding that Millennials are traveling less compared to previous generations of younger Americans, a finding that has significant implications for the Highway Trust Fund.

NHTS also serves as a benchmark against which progress can be measured on specific policy initiatives, notably in *Healthy People 2020*[11] and in the Report issued by the White House Task Force on Childhood Obesity.[52] In other cases, such as Corporate Average Fuel Economy (CAFE) Standards,[10] VM-1 Highway Statistics, and the MOVES model.[51], NHTS provides key data (and is often the only source of this data) that is used in models or other statistical analyses to provide important information to decisionmakers.

At the State and local level NHTS is a critical input to travel demand models, which are used to inform transportation planning and project initiatives. For some States and MPOs, NHTS is their only source of data for these models. Volpe was also able to uncover a few specific projects that were directly impacted by NHTS, including a bridge project, a transit project, and an interchange project.

With respect to NHTS responsiveness, the findings indicate that NHTS is highly responsive to its user community. Most notably, NHTS has developed the NHTS task force to collect feedback from the user community and to serve as bridge between users and the NHTS team. Based in part on feedback from its users, NHTS is redesigning the upcoming 2016 survey and introducing major changes to the survey methodology. NHTS responds to user questions and data requests, often calling upon Oak Ridge National Laboratory to perform additional analyses. In response to user needs, NHTS has continued to improve the tools on its website, adding Academy modules and online analysis tools. In addition, NHTS regularly conducts outreach at TRB and has convened two conferences to bring the user community together (2004, 2011).

Add-on partners also praise the NHTS team for their efforts in addressing user needs. While Add-on partners are generally very satisfied with NHTS responsiveness, they did offer suggestions for improvement, including the need for: 1) increased communication among Add-on partners, 2) ability to tailor sample purchased to weekday travel, 3) data visualization tools, and 4) online tools that would aid small States and MPOs who lack expertise in statistical analyses. A couple of Add-on partners also mentioned that NHTS needs to think about how it will incorporate technology into future data collection efforts (a topic raised by other lead users). Given the pace of change with technology, "NHTS has to be on its game" as it moves forward, both with respect to understanding data needs and with collecting quality data.

The NHTS is a broad program that encompasses all the activities related to the survey, including planning, survey administration, oversight, data preparation, and distribution. In addition, the program is responsible for outreach, an ongoing activity that is emphasized during survey planning to solicit user input, as well as after data release to support users and to publicize the availability of the data. Given the small staff of the NHTS, it is difficult for this program to realize its full potential in all these activities. Greater resources are needed to increase the value of the Program to USDOT, as well as to other Federal agencies, States/MPOs, and to researchers.

Appendix A . Interviewees

FHWA Interviewees

No.	Affiliation	Interview	Email
1	Office of Highway Policy Information	x	
2	Office of Highway Policy Information	x	
3	Office of Highway Policy Information	x	
4	Office of Transportation Policy Studies	x	
5	Independent Transportation Consultant; formerly with Federal Highway Administration	x	
6	Public Affairs, Federal Highway Administration	x	
7	Office of Highway Policy Information		x
8	Federal Highway Administration		x
9	Federal Highway Administration Division Office		x

Other DOT Federal Interviewees

No.	Affiliation	Interview	Email
10	Bureau of Transportation Statistics	x	
11	Federal Transit Administration	x	
12	Bureau of Transportation Statistics		x

State/MPO Interviewees

No.	Name	Affiliation	Interview	Email
19	**Modeling Manager**	Atlanta Regional Commission	x	
20	**Professor**	Transportation Research Center, University of Vermont		x
21	**Civil Engineer**	New York Department of Transportation	x	
22	**Program Manager**	Arizona Department of Transportation	x	
23	**Transportation Planner**	Iowa Department of Transportation	x	
24	**Transportation Modeling Manager**	Ohio-Kentucky-Indiana Regional Council of Governments	x	
25	**Principal Transportation System Modeler**	North Central Texas Council of Governments	x	

Consultant, Academic, and Other Researcher Interviewees

No.	Affiliation	Interview	Email
26	Independent Transportation Consultant	x	
27	Independent Transportation Consultant	x	

No.	Affiliation	Interview	Email
28	Texas Transportation Institute	x	
29	Center for Urban Transportation, University of South Florida	x	
30	CDM Smith	x	
31	University of California Irvine		x
32	Cambridge Systematics	x	
33	Center for Transportation Analysis, Oak Ridge National Laboratory		x
34	AARP		x
35	AAA		x
36	MacroSys		x
37	Vermont Energy Investment Corporation; formerly with Transportation Research Center, University of Vermont		x
38	BERK Consulting; Formally with U.S. Environmental Protection Agency		x
39	Sustainable Worldwide Transportation, University of Michigan		x
40	Sustainable Worldwide Transportation, University of Michigan		x
41	Columbia University		x

Appendix B . Interview Guides

B.1 NHTS Program Manager Interview Guide

[NOTE: This interview guide will be attached to an email that more fully describes the Evaluation effort. We will send the questions in advance so interviewees have some time to think about their responses. We will try to conduct all of these interviews in-person.]

> *Thank you for taking the time to meet with me today. We'll be touching on a range of topics related to the NHTS Program. First, we'd like your insights on the ways in which NHTS data are used, and how NHTS data have played a role in decision-making. We will also explore the ways in which the NHTS Program solicits and responds to feedback from its user community. Finally, we want to hear your thoughts on any challenges or hurdles the NHTS Program faces in the planning, oversight and outreach of its survey.*

1. To start, can you tell us a little bit about your history with the NHTS Program?

PROBE:

- How long have you been [were you] involved with the NHTS survey?
- How many years have [did] you serve as Program Manager?

2. Can you describe the major ways in which the NHTS Program has evolved during the time you have been involved with it (or during the time you were its manager)?

3. First, I'd like to talk about some of the reporting outputs developed by the NHTS.

   a. How did the Travel Trends document become a standard NHTS deliverable?

PROBE:

- Do you know who uses Travel Trend reports?
- Do you know how the information in the reports is being used? Have the Reports had any impact on decision-making?

   b. How do you determine what NHTS Briefs are developed in each survey cycle?

PROBE:

- Do you know who uses the Briefs?
- Do you know how the Briefs are used? Have they had any impact on decision-making?

4. Next, can you describe some other examples where the NHTS staff has contributed to important research efforts or reports using the NHTS data? For the purpose of this interview, we can discuss 2 or 3 of these examples in detail, and I will follow up with you after the interview to obtain a more complete list of your efforts.

[FOR EACH EXAMPLE, ASK:]

a. First, what was the purpose or the main question being addressed?

b. How did you use the NHTS data to address that question (e.g., incorporate NHTS data into a model, conduct trend analysis, etc.)?

c. Did you produce a report or some other deliverable that included the NHTS data analysis?

PROBE: Is it on the NHTS website? Would it be included in the Compendium?

d. We are trying to trace how NHTS data and the outputs produced by that data impact decision-making. **Do you know whether and how the example you just described has informed any phase of policy-making or rulemaking OR any phase of a program or project (e.g., planning, implementation, modifications)?** IF YES – Please explain.

PROBE:

- What [policy, rulemaking, program or project] has your NHTS work informed?
- Do you know how your NHTS work informed the [policy, rulemaking, program or project]?
- Are there other decision- making contexts in which your NHTS work has had an impact?

FOR ANY IMPACTS CITED ABOVE:

e. How much impact would you say the NHTS data had on this [policy/rulemaking/program/project]? Would you say it played a major, supporting or minor role?

EXAMPLE INTERVIEWER NOTES:

	Research Effort (a)	Purpose (b)	How NHTS Data Used (c)	Impact on Project, Policy or Rulemaking (d)
1	CAFÉ Program	To calculate fuel efficiency standards	VMT used as input to model	
2				
3				

5. Thinking about the wider community of NHTS users (beyond the NHTS program itself and the Office of Policy), are you familiar with any examples in which NHTS data (or the outputs of that data, such as models, reports, etc.) have had an impact on policies, programs, projects, or other decision making contexts?

IF YES:

a. Please describe the NHTS data that was used and the nature of the impact.

PROBE:

- What was the policy, program or project that was impacted?
- How did NHTS data inform the policy, program or project?

b. How much impact would you say the NHTS data had on this [policy/rulemaking/program/project]? Would you say it played a major, supporting or minor role?

c. In addition to transportation, are you familiar with impacts of NHTS data in other fields, such as health, energy, or the environment?

6. [SUSAN, HEATHER] We would like to identify other people who may be familiar with the impacts of NHTS data on decision making. Can you suggest any names? Or agencies? May I have their contact information?

EXAMPLE INTERVIEWER NOTES:

	Name	Organization	NHTS Research Effort
1			
2			
3			

Now we'd like to ask you about how NHTS solicits and responds to feedback from its user community.

7. First, what type of NHTS user support is available on a regular, ongoing basis?

PROBE: What types of channels are used most often by stakeholders (email, phone, user forum)?

a. How does the NHTS respond to data requests or questions from users, the media, others?
b. Are user questions/feedback saved, compiled and/or analyzed?

8. Next, can you describe some of the other efforts the NHTS has undertaken to support NHTS users and/or to obtain their input?

PROBE:

- Conferences and workshops
  - What type of feedback does the NHTS typically receive at these events?
- User Forum
  - What type of support do NHTS users receive in the Use Forum?
  - What type of feedback does the NHTS receive from this source?
- [ADELLA ONLY] Task Force
  - What prompted the creation of the NHTS Task Force?
  - Please describe how NHTS works with the Task Force; what is the nature of this relationship?
- Are there any other efforts NHTS has undertaken to support its users or to obtain their input?

9. How has the NHTS made changes to it surveys based on user feedback?
   a. How have the findings from the NHTS Task Force (TRB Circular - Exploring New Directions for the National Household Travel Survey) been incorporated into the decision making process for the 2015 NHTS?

PROBE:

- What changes are being made to the 2015 NHTS as a result of the Task Force Recommendations?
  b. How are decisions made to act on (or not act on) suggestions provide by NHTS Task Force?
  c. In addition to the Task Force, have other feedback mechanisms informed changes to the to the 2015 survey?

10. Has NHTS made changes to its website or the outputs it produces based on feedback from the user community? If yes, please describe.

PROBE:

- Online tools available on NHTS website
- Academy Modules (arose from NHTS Task Force)
- User Guidance documents
- Reports or briefs on current topics of interest
- Other
  a. How are decisions made to act on (or not act on) feedback provided by NHTS users?

11. How does NHTS reach out or respond to the needs of its State and MPO partners?

12. Is there any other information you would like to share about the ways in which -- and the extent to which -- NHTS responds to its user community?

In this last part of the interview, we have a few questions on the challenges or hurdles faced by the NHTS Program.

INTERVIEWER NOTE: SUSAN AND HEATHER ONLY. ADELLA TO BE COVERED AT A SEPARATE TIME.

13. First, are you familiar with any challenges NHTS has faced during the process of planning for the NHTS surveys? For example, these may be organizational or institutional challenges.

PROBE:

- Survey method design and content
  - Tailoring sample size to available budget
  - Designing sample
  - Selecting administration method, etc.
- Outreach efforts to potential add-on partners
- Contracting process
- OMB approval process

a. Was NHTS able to overcome these challenges? If yes, How?

14. What challenges has the NHTS faced in administering and overseeing the NHTS surveys?

PROBE:

- Monitoring progress during data collection
- Data cleaning, weighting and preparation

a. Was NHTS able to overcome these challenges? If yes, How?

15. Next we want to turn to the challenges NHTS faces in conducting outreach efforts. First, we'd like to understand what the NHTS objectives or goals are with respect to outreach. Can you please describe NHTS goals and objectives in conducting outreach?

16. What challenges has NHTS faced in conducting outreach and effectively communicating with NHTS users? (Federal, Add-on, other State/MPO, Private sector, etc.).

    a. Was NHTS able to overcome these challenges? If yes, How?

Those are all my questions.

17. Do you have any additional comments or feedback you would like to share regarding the topics we have discussed today?

PROBE: Do you have any final comments on the value of the NHTS Program to decision makers?

Thank you very much! We sincerely appreciate you taking the time to speak with us.

B.2 FHWA Staff Interview Guide

[NOTE: This interview guide will be attached to an email that more fully describes the Evaluation effort. We will send the questions in advance so interviewees have some time to think about their responses. Most of these interviews will be conducted in-person and a couple are likely to be by phone.]

> *Thank you for taking the time to meet with me today. We'll be touching on a range of topics related to the NHTS Program. First, we'd like your insights on the ways in which NHTS data are used, and how NHTS data have played a role in different types of decision-making. We will also explore the ways in which the NHTS Program solicits and responds to feedback from its user community. Finally, we want to hear your thoughts on any challenges or hurdles the NHTS Program faces in the planning, oversight and outreach of its survey.*

1. To start, how long have you been at FHWA [Office of Policy] and can you tell us a little bit about your role with respect to the NHTS Program?

2. Can you describe the major ways in which the NHTS Program has evolved during the time you have been involved with the NHTS Program?

3. Next, can you briefly describe two or three key examples where Office of Policy has used the NHTS data? For the purpose of this interview, we can discuss these examples in detail, and I will follow up with you after the interview to obtain a more complete list of your efforts involving the NHTS.

[FOR EACH EXAMPLE, ASK:]

a. First, what was the purpose or the main question being addressed?
b. How did you use the NHTS data to address that question (e.g., incorporate NHTS data into a model, conduct trend analysis, etc.)?
c. Did you produce a report or some other deliverable that included the NHTS data analysis?

PROBE: Can we get the citation?

d. We are trying to trace how NHTS data and the outputs produced by that data impact decision-making. **Do you know whether and how the example you just described has informed any phase of policy-making or rulemaking OR any phase of a program or project (e.g., planning, implementation, modifications)?** IF YES – Please explain.

PROBE:

- What [policy, rulemaking, program or project] has your NHTS work informed?
- Do you know how your NHTS work informed the [policy, rulemaking, program or project]?
- Are there other decision- making contexts in which your NHTS work has had an impact?

FOR ANY IMPACTS CITED ABOVE:

e. How much impact would you say the NHTS data had on this [policy/rulemaking/program/project]? Would you say it played a major, supporting or minor role?

EXAMPLE INTERVIEWER NOTES:

	Research Effort (a)	Purpose (b)	How NHTS Data Used (c)	Impact on Project, Policy or Rulemaking (d)
1	CAFÉ Program	To calculate fuel efficiency standards	VMT used as input to model	
2				
3				

4. Thinking about the wider community of NHTS users (beyond the Office of Policy), are you familiar with any examples in which NHTS data have had an impact on policies, programs, projects, or other decision making contexts?

IF YES:

a. Please describe the NHTS data that was used and the nature of the impact.

PROBE:

- What was the policy, program or project that was impacted?
- How did NHTS data inform the policy, program or project?
    b. How much impact would you say the NHTS data had on this [policy/rulemaking/program/project]? Would you say it played a major, supporting or minor role?
    c. In addition to transportation, are you familiar with impacts of NHTS data in other fields, such as health, energy, or the environment?

5. We would like to identify other people who may be familiar with the impacts of NHTS data on decision making. Can you suggest any names? Or agencies? May I have their contact information?

EXAMPLE INTERVIEWER NOTES:

	Name	Organization	NHTS Research Effort
1			
2			
3			

Now we'd like to ask you about how NHTS solicits and responds to feedback from its user community.

6. What efforts has NHTS undertaken to support NHTS users and to obtain feedback from its users?

PROBE:

- Conferences and Workshops
- Task Force
- User Forum

7. Has NHTS made changes to its website or the outputs it produces based on feedback from the user community? If yes, please describe.

PROBE:

- Online tools available on NHTS website
- Academy Modules (arose from NHTS Task Force)
- User guidance documents
- Reports or briefs on current topics of interest?
- Other?

8. How does NHTS reach out or respond to the needs of its State and MPO partners?

9. Is there any other information you would like to share about the ways in which -- and the extent to which -- NHTS solicits and responds to feedback from its user community?

We have a few more questions on challenges or hurdles that NHTS has faced in the planning, administration and outreach for the survey.

10. First, are you familiar with any challenges NHTS has faced during the process of planning for the NHTS surveys? For example, these may be organizational or institutional challenges.

PROBE:

- Survey method design and content
- Outreach efforts to potential add-on partners
- Contracting process
- OMB approval process

    a. Was NHTS able to overcome these challenges? If yes, How?

11. What challenges has the NHTS faced in administering and overseeing the NHTS surveys?

PROBE:

- Monitoring progress during data collection
- Data cleaning, weighting and preparation

    a. Was NHTS able to overcome these challenges? If yes, How?

12. Next we want to turn to the challenges NHTS faces in conducting outreach efforts. First, we'd like to understand what the NHTS objectives or goals are with respect to outreach. Can you please describe NHTS goals and objectives in conducting outreach?

13. What challenges has NHTS faced in conducting outreach and effectively communicating with NHTS users? (Federal, Add-on, other State/MPO, Private sector, etc.)

    a. Was NHTS able to overcome these challenges? If yes, How?

Those are all my questions.

    b. Do you have any additional comments or feedback you would like to share regarding the issues we have discussed today?

    PROBE: Do you have any final comments on the value of the NHTS Program to decision makers?

Thank you very much! We sincerely appreciate you taking the time to speak with us.

B.3 Non- DOT Interview Guide: Non-DOT Agencies (CDC, EIA, HUD, AAA, EPA contacts), Academics and Researchers

[NOTE: This interview guide will be attached to an email that more fully describes the Evaluation effort. We will send the questions in advance so interviewees have some time to think about their responses. Note that most of these interviews will take place over the phone; a couple may be scheduled in person, if possible.]

> *Thank you for taking the time to meet with me today. We'll be focusing primarily on the ways in which you have used the NHTS data, and how NHTS data (including outputs of the data, such as models, reports) have played a role in different types of decision making.*

1. To start, can you tell us a little bit about the work you do at {INSERT AGENCY} and your research interests?
2. How long have you been working with NHTS data? Which NHTS products do you typically use?

PROBE:

-Datasets - Which surveys have you worked with? Only the 2009 survey? 2001? Earlier versions?

- User guidance documents
  - Briefs, reports
  - Online analysis tools
  - Other?

3. Can you briefly describe how you have used the NHTS data? If you have used the data in a variety of contexts, please pick 3 or 4 examples, and we can follow up with you after the interview to obtain a more complete list of your efforts.

[FOR EACH EXAMPLE, ASK:]

a. First, what was the purpose or the main question being addressed by your work?
b. How did you use the NHTS data to address that question (e.g., incorporate NHTS data into your model, conduct trend analysis, etc.)?

PROBE:

- Did you use data from a single NHTS, or did you combine information from multiple surveys?

c. Did you produce a report or some other deliverable that included the NHTS data analysis? PROBE: Can we get the citation?
d. We are trying to trace how NHTS data and the outputs produced by that data impact decision-making. **Do you know whether and how the example you just described has informed any phase of policy-making or rulemaking OR any phase of a program or project (e.g., planning, implementation, modifications)?** IF YES – Please explain.

PROBE:

- What [policy, rulemaking, program or project] has your NHTS work informed?
- Do you know how your NHTS work informed the [policy, rulemaking, program or project]?
- Are there other decision- making contexts in which your NHTS work has had an impact?

FOR ANY IMPACTS CITED ABOVE:

e. How much impact would you say the NHTS data had on this [policy/rulemaking/program/project]? Would you say it played a major, supporting or minor role?

EXAMPLE INTERVIEWER NOTES:

	Research Effort (a)	Purpose (b)	How NHTS Data Used (c)	Impact on Project, Policy or Rulemaking (d)
1	CAFÉ Program	To calculate fuel efficiency standards	VMT used as input to model	
2				
3				

4. Beyond your own work, are you familiar with any examples in which NHTS data (or the outputs of that data, such as models, reports, etc.) have had an impact on policies, programs, projects, or other decision making contexts?

   IF YES:

   a. Please describe the NHTS data that was used and the nature of the impact.

   PROBE:

- What was the policy, program or project that was impacted?
- How did NHTS data inform the policy, program or project?

   b. How much impact would you say the NHTS data had on this [policy/rulemaking/program/project]? Would you say it played a major, supporting or minor role?

5. We would like to identify other people who may be familiar with the impacts of NHTS data on decision-making. Can you suggest any names? Or agencies? May I have their contact information?

EXAMPLE INTERVIEWER NOTES:

	Name	Organization	NHTS Research Effort
1			
2			
3			

Next, I'd like to ask you a couple of questions about your interactions with NHTS.

6. Do you ever contact the NHTS Program Office with questions about the data, specific data requests or web support issues?

   IF YES:

   a. How do you typically contact NHTS (email, phone, User Forum)?
   b. How frequently have you done so?
   c. What has your experience been in receiving a response?

   PROBE: Did you receive the information you needed? Was your question answered?

7. Have you provided feedback to the NHTS on the survey (including content or methodology), the online tools or other outputs?

   a. IF YES: In what ways? Please describe.

PROBE:

- Have you participated in any NHTS Task Force activities?
- Have you attended any NHTS conferences or workshops?

   b. Do you feel that the NHTS was open to your comments and suggestions?

8. Do you have any suggestions for how NHTS might facilitate communication with its user community?

Those are all my questions.

9. Do you have any additional comments or feedback you would like to share regarding the issues we have discussed today?

PROBE: Do you have any final comments on the value of the NHTS Program to decision makers?

Thank you very much! We sincerely appreciate you taking the time to speak with us.

B.4 State/MPO/Add-On Partner Interview Guide

[NOTE: This interview guide will be attached to an email that more fully describes the Evaluation effort. We will send the questions in advance so interviewees have some time to think about their responses. Note that all of these interviews will take place by phone.]

> *Thank you for taking the time to meet with me today. We'd like learn about the ways in which your agency uses the NHTS data and how NHTS data (including outputs of the data, such as models, reports) have played a role in different types of decision making.*

1. To start, can you tell us a little bit about your work and your job responsibilities at [INSERT AGENCY]?
2. How long have you been working with NHTS data?

3. Are you participating as an add-on partner for the 2015 NHTS survey?

   a. Did you participate as an add-on partner in previous NHTS surveys -- in 2001? In 2009?

FOR THOSE WHO PARTICIPATED IN 2001 OR 2009 BUT NOT 2015:

4. Can you tell us why your [State/MPO] is no longer participating as an add-on partner?

5. Can you briefly describe how your State or region has used the NHTS data? For the purpose of this interview, we can discuss two or three key examples, and I will follow up with you after the interview to obtain a more complete list of your efforts.

[FOR EACH EXAMPLE, ASK:]

   a. First, what was the purpose or the main question being addressed?
   b. How did you use the NHTS data to address that question (e.g., incorporate NHTS data into your model, conduct trend analysis, etc.)?

   Probe: Did you use only the 2009 data or earlier versions as well?

   c. Did you produce a report or some other deliverable that included the NHTS data analysis?

PROBE: Can we get the citation?

   d. We are trying to trace how NHTS data and the outputs produced by that data have impacted decision-making. **Do you know whether and how the example you just described has informed any phase of policy-making OR any phase of a program or project (e.g., planning, implementation, modifications) in your State or region?** IF YES – Please explain.

PROBE:

- What [policy, program or project] has your NHTS work informed?
- Do you know how your NHTS work informed the [policy, program or project]?
- Are there other decision- making contexts in which your NHTS work has had an impact?

FOR ANY IMPACTS CITED ABOVE:

e. How much impact would you say the NHTS data had on this [policy/ program/project]? Would you say it played a major, supporting or minor role?
f. In addition to transportation, are you familiar with impacts of NHTS data in other fields, such as public health, energy, or the environment?

EXAMPLE INTERVIEWER NOTES:

	Research Effort (a)	Purpose (b)	How NHTS Data Used (c)	Impact on policy. Program or project (d)
1	CAFÉ Program	To calculate fuel efficiency standards	VMT used as input to model	
2				
3				

6. We would like to identify other people who may be familiar with the impacts that NHTS data have had on decision making. Can you suggest any names? Or agencies? May I have their contact information?

EXAMPLE INTERVIEWER NOTES:

	Name	Organization	NHTS Research Effort
1			
2			
3			

Next, I'd like to ask you a couple of questions about your interactions with NHTS.

7. Do you ever contact the NHTS Program Office with questions about the data, user guides or with specific data requests?
8. IF YES: Please describe.
    a. How do you typically contact NHTS? (email, phone, User Forum)
    b. How frequently do you/have you interact(ed) with NHTS ?
    c. What has your experience been in receiving a response?

PROBE: Did you receive the information you needed? Was your question answered?

9. Have you provided feedback to the NHTS on the survey (including content or methodology), the online tools or other NHTS outputs?

    a. IF YES: In what ways? Please describe.

    PROBE:

- Have you participated in any NHTS Task Force activities?
- Have you attended any NHTS conferences or workshops?

    b. Do you feel that the NHTS was open to your comments and suggestions?

10. Do you have any suggestions for how NHTS might facilitate communication with its add-on partners?

    a. How about to the user community as a whole?

Now we'd like to turn to your experience as an add-on partner.

11. Can you describe any challenges or hurdles you have faced as an NHTS add-on partner?

    Probe:

- Becoming an add-on partner
- During the planning phases of the survey (e.g., selecting you add-on sample size, designing the sampling strategy, etc.)
- During the data prep/delivery stage

Those are all my questions.

12. Do you have any additional comments or feedback you would like to share regarding the topics we have discussed today?

    PROBE: Do you have any final comments on the value of the NHTS Program to decision makers?

Thank you very much! We sincerely appreciate you taking the time to speak with us.

Appendix C . Email Contact Language

C.1 Email Outreach—Initial

Dear XXX,

In support of the Federal Highway Administration, the Volpe Center (U.S. Department of Transportation) is conducting an evaluation of the National Household Travel Survey (NHTS) Program to understand and document the impacts of this Program. **As a user of the NHTS data, you can inform this evaluation.**

One of the key objectives of the evaluation is to provide evidence of how NHTS data (and the outputs produced by that data, such as trend analyses, reports, papers, models etc.) impact decision-making, particularly with respect to the process of developing or modifying policies, programs or projects.

You can help by responding to the following questions:

1. **Can you briefly describe one or two examples of how you use (or have used) NHTS data in your work, including**:
    - Purpose of your research effort/work?
    - NHTS data you used or analyzed (e.g. vehicle occupancy, demographic, vehicle fleet)?
    - The intended audience?
    - The outputs of your work (e.g., model, report, publication)?

Please also provide any citations for the work if appropriate

2. **Are you familiar with examples of your own work or other people's work in which NHTS data (or outputs from the data, such as papers, reports, models etc.) has informed any phase of a project, program or policy-making effort?**
    - We are interested in impacts to decisions made at the Federal, State, regional and local level.

If yes, please describe, and provide us with any relevant citations.

3. **Can you provide us with additional contacts who may be familiar with the impacts of NHTS data on decision-making?**

We are requesting that you please respond by XXX. If you feel it would be useful or easier to discuss these questions by phone, I would be happy to set up a meeting. Please do not hesitate to contact me with any questions.

Thank you in advance for your consideration.

Sincerely,

XXX

C.2 Email Outreach—Follow-Up Conversation

Dear XXX,

In support of the Federal Highway Administration, the Volpe Center (U.S. Department of Transportation) is conducting an evaluation of the National Household Travel Survey (NHTS) to understand and document the impacts of this program. I have been in touch with… [EXPLAIN WHY WE ARE CONTACTING THE INTERVIEWEE]. As a user of the NHTS data, you can provide valuable assistance.

The key objectives of the evaluation are to understand the breadth and depth of NHTS data use and to provide qualitative evidence of how NHTS data (and the outputs produced by that data, such as trend analyses, reports, papers, models etc.) inform decision-making, particularly with respect to the process of developing or modifying policies, programs or projects. We understand that [PROVIDE EXAMPLE OF INTERVIEWEE'S RESEARCH].

I'd like to schedule a brief call (no more than 30 minutes) to discuss how you are using NHTS data and to obtain your thoughts on the ways in which NHTS data might inform decision making.

Can you please let me know your availability on the following dates? If the dates below are not convenient, please feel free to suggest an alternate date. Based on your response, I will send a meeting invite.

Possible dates:

- Date – Time
- Date – Time
- Date – Time

Thank you in advance for your consideration. I look forward to hearing from you.

Sincerely,

XXX

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