

VCMPO Model Calibration and Home Based Travel Survey

Technical Memorandum Number Three

Household Travel Survey Design

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Background

One of the major purposes of the Volusia County Metropolitan Planning Organization (VCMPO) Model Calibration and Home Based Travel Survey project is to collect information that will allow for a better understanding of the travel habits and patterns of residents within Volusia County. To understand the travel behavior characteristics of these trips, a data collection program that consists of household travel characteristics surveys is being proposed.

The primary objective of the Volusia County Metropolitan Planning Organization (VCMPO) Model Calibration and Home Based Travel Survey is to collect data that will support calibration of the existing Volusia County travel demand forecasting model and development of future models. The models, in turn, must be specified in a way that they can analyze the policies and projects that are contemplated to support the goals and objectives in the region's Long Range Transportation Plan. The household travel survey design that is outlined in this memorandum reflects the practical experience that this team has had collecting this type of survey data, using these data for model development and using travel forecasting models to evaluate transportation policies.

There are two key objectives of the approach that has been designed for this survey:

- 1) Minimize sampling and non-response bias – A survey sample can provide good estimates of travel characteristics if and only if the sample of households who agree to complete the survey are entirely representative of the full population. To ensure that this is the case means that the sample must be drawn such that all household types have an equal chance of being selected and that those who choose to complete the questionnaire are representative of all households. The former can be accomplished reasonably well using a number of common random sampling approaches. The latter – getting responses from representative households – requires significantly more effort. Many individuals and households simply will not respond to telephone solicitation. Others feel that they are too busy to spend time completing a lengthy questionnaire; these are most likely to be the households who also make the most trips.
- 2) Ensure accuracy of data – There are at least two major challenges to collecting accurate travel/activity data. First, it is important that the household data contain a complete enumeration of household members and trips so that trip generation rates can be computed. Second, the trip information that is provided, including locations of trip ends must be accurately reported.

The International Conference on Transport Survey Quality and Innovation, held in August 2001, resulted in a number of very relevant recommendations about how household travel surveys should be designed to accomplish these objectives.¹ The design that is described in this memorandum reflects the key recommendations from that conference.

¹ See http://www.its.usyd.edu.au/conferences/2001_Survey_Methods_Conference/int_transport.htm

Introduction

The design of a survey consists of two key elements:

- 1) Sampling and administration plan and
- 2) Instrument design

This technical memorandum describes the approach that will be used in the survey sampling and administration and outlines the general characteristics of the survey instrument design. The development of the instrument is in progress as this memorandum is being prepared. This current version of this “work in progress” is available for review at

<http://www.surveycave.com/volusia/password.asp>.

Survey Sampling and Administration Plan

The survey design employs the general principles of the Tailored Design Method, an approach that has proven to maximize response rates in numerous past applications. An integral part of the design involves using a multi-method, multi-instrument approach that includes both telephone and mail recruiting and allows for mailback, phone and Internet response. This approach provides alternatives to those who have an aversion to being contacted by telephone and allows a convenient, extremely efficient option for Internet completion for those who have Internet access.

The multi-method, multi-instrument approach adds some complexity to the design of the sampling and administration plan, but recent research demonstrates that this complexity returns benefits in increased unit and item response.²

Survey Sampling Plan

The sampling frame for this survey includes all resident households within the study area. There are several possible ways of selecting a sample from this frame. The two most commonly used approaches are to 1) use random digit dialing to identify and recruit survey households and 2) use a mailing address-based sample. Each of these methods has unique advantages and limitations and both have been used successfully in recent U.S. household travel surveys. For this project, we believe that the address-based sampling approach will be the most effective. This involves obtaining an address sample and, to allow phone recruiting where necessary, augmenting the address lists with telephone numbers.

A commercial survey list provider, Survey Sampling, Inc., provides suitable address-based lists that have been constructed in a way that includes all resident households, including recently-located households. These lists are somewhat over-inclusive; they include approximately 15% undeliverable addresses. However, over-inclusion is not a problem assuming initial mailings are sent with first class postage that allows return-to-sender. The fraction of samples in the list that have phone numbers varies significantly by region, depending in large part on the number of households who elect to have unlisted numbers.

The project requires enough data to estimate trip generation for Volusia County with a maximum of 5% sampling error margin and a reliability level of 95%. A number of past studies have shown that the coefficient of variation of trip generation rates at the zonal level is in the range of 0.8 to 1.0. For Volusia County as a whole, this results in a required sample size of approximately 1,540. If trip generation were to be estimated directly from the survey data, the required sample size per subarea would similarly be calculated as:

² Adler, T. "Reducing the Effects of Item Nonresponse in Transport Surveys," invited paper, International Conference on Survey Quality and Innovation, Kruger Park, South Africa, August 2001.

$$n = c.v.^2 Z^2 / E^2$$

Where: c.v. is the coefficient of variation

Z is the Z-score for the Normal distribution

E is the allowable error

Using a 10% error target and assuming a coefficient of variation of 1.0, the sample size required per subarea would be in the range of 385. Using these simple calculations, the proposed sample of approximately 1,540 households would thus support estimation of four subareas. However, past studies have demonstrated that the sources of most of the variation in trip generation rates among geographic areas are household characteristics and transportation accessibility differences among those zones. Survey data can be used to statistically estimate parameters of a model that relates these factors to trip generation rates; the model, in effect, “explains” most of the seemingly random variation that exists between zones. That trip generation model can then be used to estimate zone-level trip generation rates, with the result that zone-level errors are in the same order of magnitude as the errors of the trip generation model.

The sample size requirements for estimating a trip generation model are, in aggregate, substantially lower than what would be required if zone-to-zone variations in trip generation were purely random (as assumed in the calculations above). This effect can be demonstrated most easily for a classification-style trip generation model, of the type used in FSUTMS. This type of model, which will be used for this project, divides the household population into discrete classes defined by household characteristics. Separate rates are estimated for each of the classes and zone-level trip generation is estimated by applying the rates in proportion to the composition of households in each class in each zone. The resulting zone-level trip generation rate estimates have error levels that are a convex combination of the error levels for each class in the trip generation model.

For the classification-style trip generation model, the sample size is dependent only on the number of classes for which rates must be estimated and on the coefficients of variation of the rates for each of the classes. It is not possible to determine in advance the number of classes that will be necessary to adequately explain variations in trip generation rates in Volusia County nor is it possible to determine the exact coefficients of variation within classes. However, most past studies generally have used between approximately 10 and 25 classes for the trip generation models and experience with these models indicates that the coefficients of variation within these more homogeneous household classes are in the range of 0.5 (as compared to the 0.9 within zones). Using an assumed 15 classes in the model and coefficients of variation within classes averaging 0.5, the desired total sample size for sampling errors less than 10% is approximately 1,500 observations. The proposed sample will include 1,540 households; an adequate sample size for this purpose.

The sampling requirements of trip generation estimates are only one part of the sampling required to meet the overall household survey objectives. To estimate a detailed origin/destination trip matrix from household survey data would require an extraordinarily large

sample. The household survey is generally used instead to determine the trip length distributions, by trip purpose. This is an appropriate objective given that a trip distribution model will be estimated and it will be able to fill in cells of the origin/destination matrix at any level of aggregation. The trip matrix can be further refined using traffic count data.

The household survey may also be used to estimate mode splits and mode choice model parameters. The trip diary information will provide descriptive information about current mode choices. Combined with network information about available mode options, this information can also be used as “revealed preference” data to estimate parameters of a mode choice model.

The sample size requirement for estimating trip length distributions and mode splits is considerably below the 1,540 households required to support trip generation estimates.

Survey Administration Plan

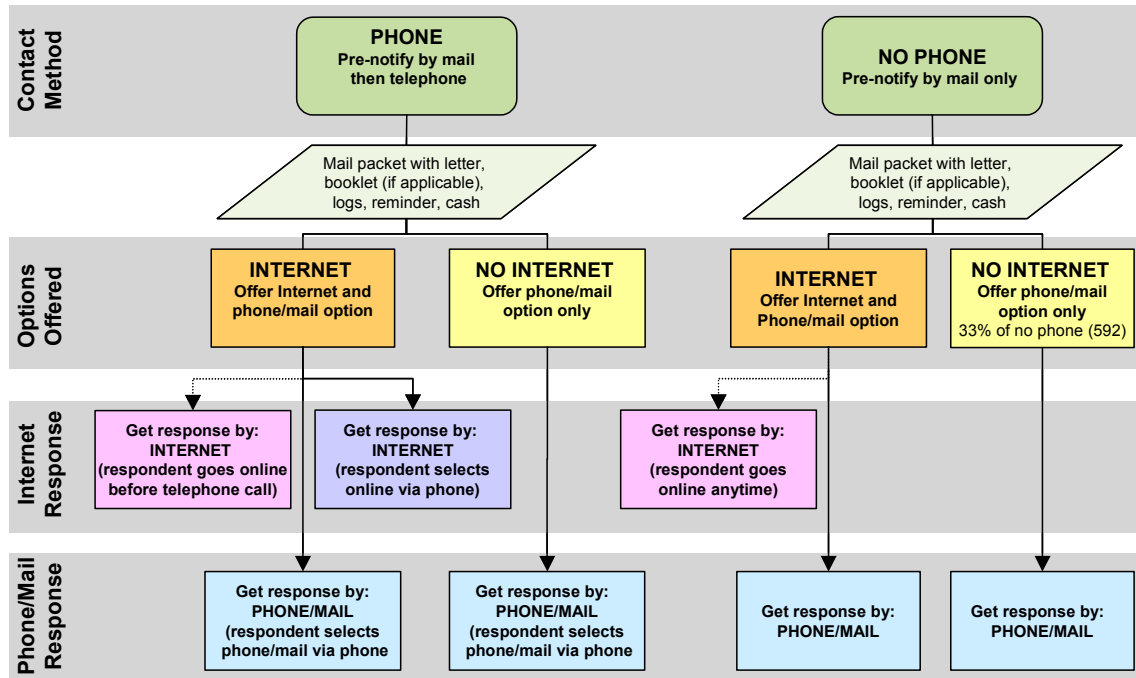
The survey administration will be divided into three phases:

- 1) Pre-contact – Obtain a random sample list and send pre-contact letters to those selected in this sampling. Invite others to participate through the Public Awareness Campaign.
- 2) Recruit – Place phone calls to those on the random sample list who have phone listings, requesting participation, collecting Stage 1 (household information) data and assigning an initial travel day. Mail packets to those on the list without phone numbers, including printed survey forms, Internet access information and assigning a travel day. Provide materials to those recruited through the Public Awareness Campaign.
- 3) Retrieval – Track survey response by phone, mail and Internet. Provide follow-up reminders to all who have agreed to participate. An acceptable retrieval window will be set to ensure that the data collected involve recollections of reasonably recent trip-making.

The sample will be split based on whether a phone number is available for a given address, and further split depending on whether the household has Internet access. The administration will proceed as described in Figure 3-1.

The survey process will be tested in a pilot to be conducted in November of 2001. The full survey will begin in January 2002 and completed no later than April 2002.

Figure 3-1
Household Travel Survey Design
Survey Administration Plan



Design of the Survey Instruments

The administration plan allows respondents to use any of three methods to report their travel activity:

- 1) By mail on printed forms,
- 2) By telephone, guided by an interviewer or
- 3) Over the Internet using a web instrument

Two instruments are being designed to support these options: printed forms that serve as complete travel diary instruments and a web instrument that will serve both phone interviewers as well as respondents who choose to respond directly over the Internet. Both are designed as two-stage instruments where Stage 1 collects household information and assigns an initial travel reporting day and the Stage 2 portion collects travel diary information.

Printed Instrument

The printed Stage 1 instrument will be in a booklet form, separate from the travel diary forms. The travel diary forms will consist of a set of letter-size sheets, each of which is sufficient for recording the travel activity of a single household member. The forms will be finalized after the web instrument is completed.

Web Instrument

The web instrument is under development as this memorandum is being prepared. The current version can be referenced at <http://www.surveycave.com/volusia/password.asp>. The instrument will be populated with all survey questions and geocoding data after the Travel Survey Design Workshop, scheduled for early October, 2001. Example screens from the instrument, to illustrate the approach, are included at the end of this memorandum.

A number of techniques are employed to facilitate the recording of data and improve their accuracy. First, the instrument is designed in a way that first establishes the list of travel activities that each household member has undertaken and then requests details for each of the trips linking those activities. This approach is being used in the current U.S. DOT National Household Travel Survey (NHTS) and has been shown to result in more accurate indications of total trip-making.

An advanced online geocoding system is being integrated into the travel survey instrument. Respondents (or telephone operators, for telephone completions) can identify a trip end by entering a street address, identifying the nearest intersection, providing the name of a commercial establishment, using a point-and-click map or selecting a previously-identified location. Immediate feedback is given as to whether the location has been correctly identified in the GIS database and, if so, the latitude, longitude and TAZ of the location are recorded and can be used to provide geographic context for subsequent questions. If a named location cannot be matched in the GIS database, the respondent is prompted for additional information to assist in matching using other criteria. Resource Systems Group's online geocoding approach has been used in numerous travel surveys, including recent Orlando-area and Miami surveys for the Turnpike's model update project.

The design includes several features that reduce respondent burden. For example, trip locations, once identified, can be chosen from a pick list so that they do not have to be re-specified for subsequent trips to the same location. This feature is particularly useful for the two-day format to be used in Volusia County where many of the locations will be visited more than once. An advanced rostering system allows respondents to simply indicate when family members travel together (e.g., parent driving child) and avoid the need to re-enter the trip information for those other family members. The system also uses extensive internal consistency checks to ensure that data are correctly entered and, if not, to have them corrected on the spot.

Figure 3-2
Household Travel Survey Design
Example Web Instrument Screen – Welcome Page

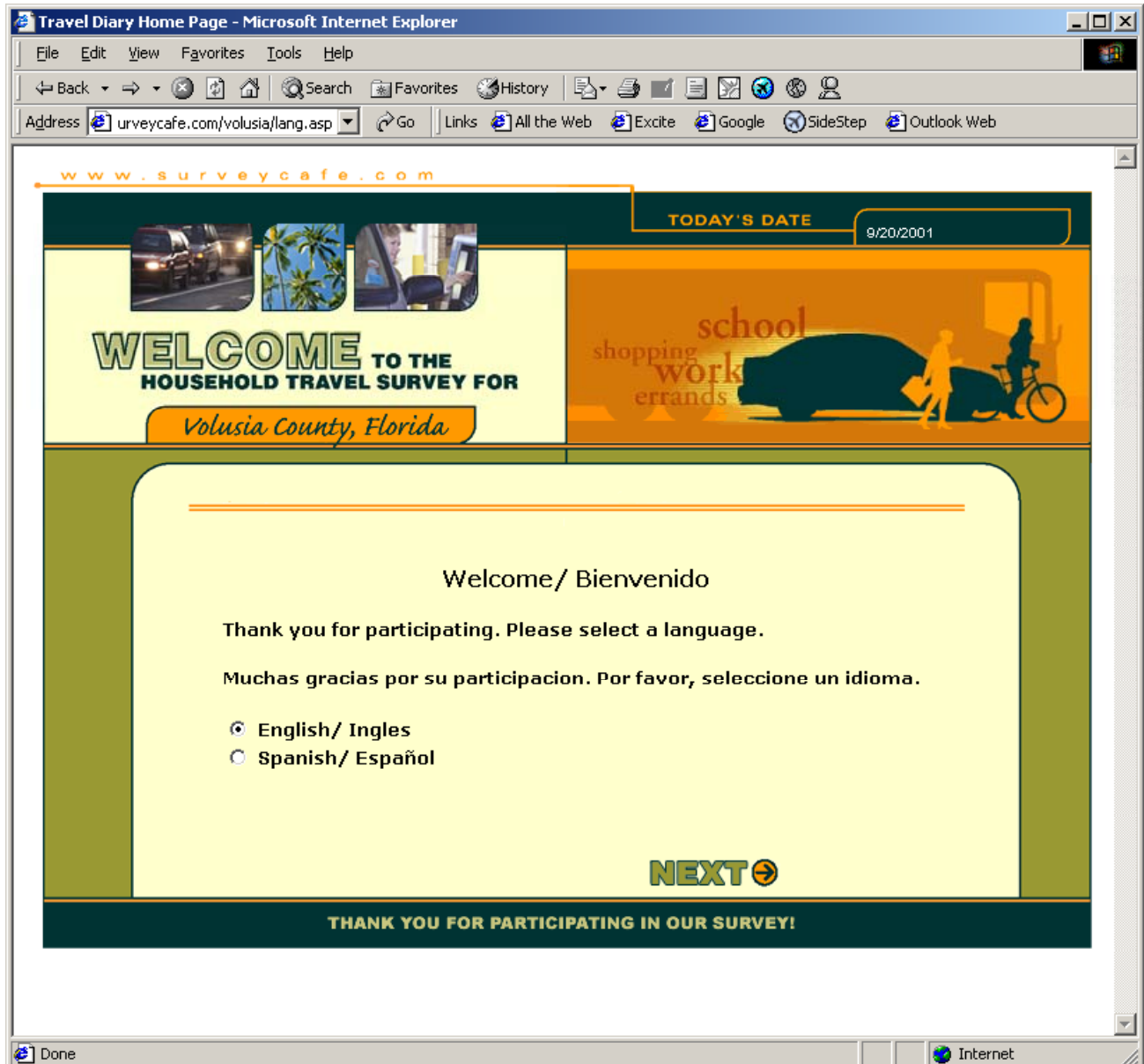


Figure 3-3
Household Travel Survey Design
Example Web Instrument Screen – Welcome Page

Travel Diary Home Page - Microsoft Internet Explorer

File Edit View Favorites Tools Help

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www.surveycafe.com

TODAY'S DATE 9/20/2001

WELCOME TO THE HOUSEHOLD TRAVEL SURVEY FOR
Volusia County, Florida

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Thank you for participating in the Volusia County Travel Survey!

We will be mailing you an additional token of our appreciation for agreeing to complete this Internet survey. If you would like additional information about the purpose of this survey and how your responses will be used, [click here](#).

First, please provide your e-mail address so that we can correspond with you as needed during the survey process. We will remove your e-mail and postal mailing addresses from our records once the survey process is complete.

E-MAIL ADDRESS:

Click NEXT to continue.

NEXT ➡

Done Internet

Figure 3-4
Household Travel Survey Design
Example Web Instrument Screen – Travel Diary Introduction

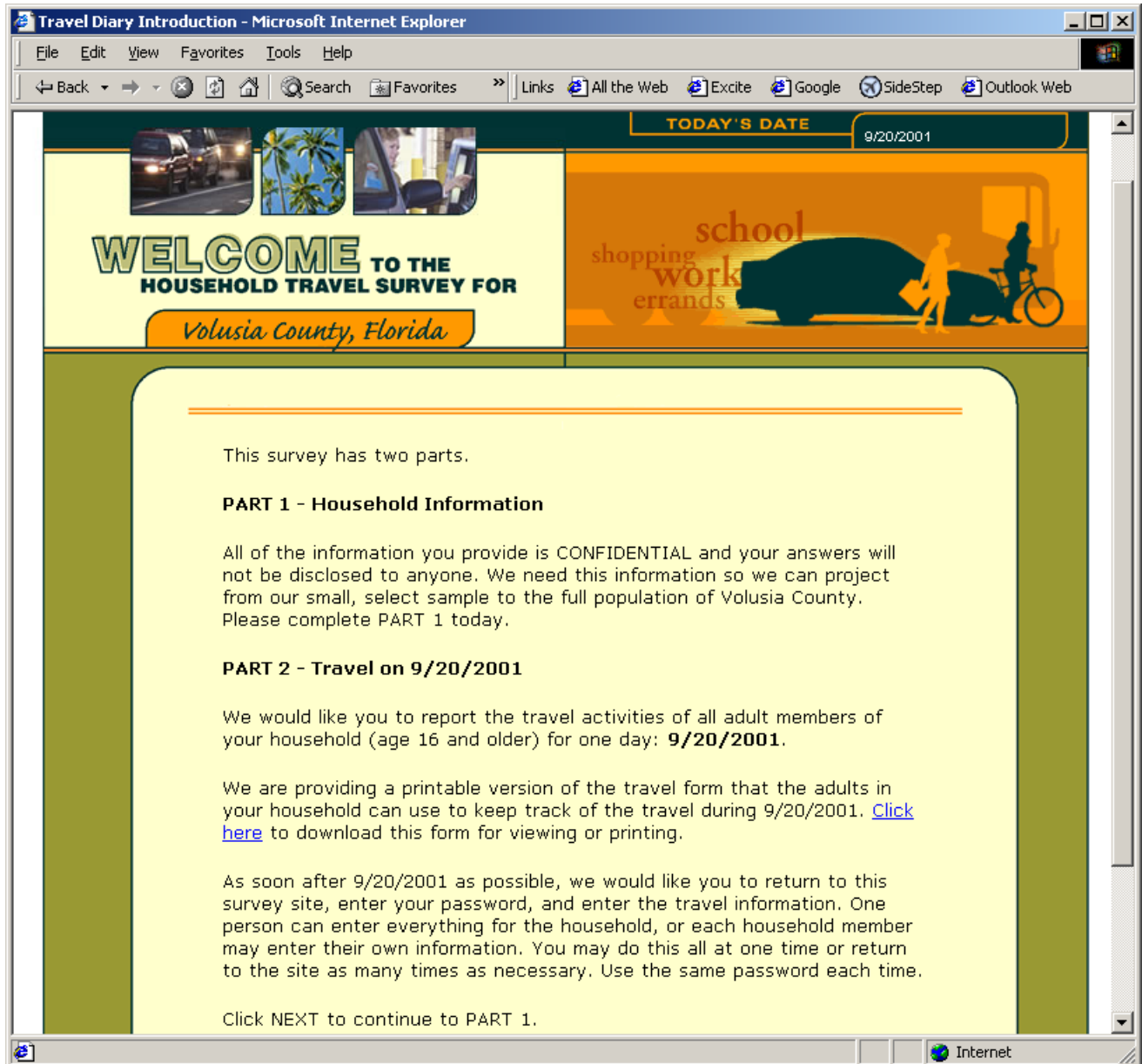


Figure 3-5
Household Travel Survey Design
Example Web Instrument Screen – Household Information

HOUSEHOLD TRAVEL SURVEY FOR *Volusia County, Florida*

INSTRUCTIONS

PART 1 - Household Information

Enter information about your household then click the NEXT button to continue.

This section should take less than 5 minutes to complete.

- 1 How many people age 16 or older live in your household?
- 2 How many people age 15 or younger live in your household?
- 3 How many motor vehicles are operated by your household?
- 4 Do you rent or own your home?
☐ rent
☐ own
- 5 Which type of home do you live in?
☐ condominium/townhouse ☐ triplex (3-family home)
☐ mobile home ☐ fourplex (4-family home)
☐ single-family home ☐ multi-family home (5+ families)
☐ duplex (2-family home)
- 6 What is your household's annual income before taxes?

<input type="radio"/> less than \$10,000	<input type="radio"/> \$50,000 to \$59,999
<input type="radio"/> \$10,000 to \$14,999	<input type="radio"/> \$60,000 to \$74,999
<input type="radio"/> \$15,000 to \$24,999	<input type="radio"/> \$75,000 to \$99,999
<input type="radio"/> \$25,000 to \$34,999	<input type="radio"/> \$100,000 to \$124,999
<input type="radio"/> \$35,000 to \$49,999	<input type="radio"/> \$125,000 or more

NEXT ➡

Figure 3-6
Household Travel Survey Design
Example Web Instrument Screen – Household Members

Household Members - Microsoft Internet Explorer

File Edit View Favorites Tools Help

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HOUSEHOLD TRAVEL SURVEY FOR *Volusia County, Florida*

INSTRUCTIONS

PART 1 - Person Information

Enter an ID and age for each household member then click NEXT to continue.

You indicated that there are 2 people in your household that are age 16 or older and 2 who are less than 16 years of age. Please enter a first name, initials, or other identifier of 6 characters or less, and an age for each member of your household. Enter 0 if a household member is less than one year old.

Person #	Name or Initials	Age (years)	Gender (m or f)
1	Mom	38	f
2	Dad	36	m
3	Sis	13	f
4	Bro	11	m

NEXT ➡

Done Internet

Figure 3-7
Household Travel Survey Design
Example Web Instrument Screen – Household Member Information

The screenshot shows a web browser window titled "Household Member Information - Microsoft Internet Explorer". The address bar displays "www.surveycafe.com". The page has a header with a logo on the left and the title "HOUSEHOLD TRAVEL SURVEY FOR Volusia County, Florida" on the right. The main content area is divided into two columns. The left column, titled "INSTRUCTIONS", contains the text "PART 1 - Driving & Employment Info." and "Enter information for each member of your household over the age of 15 then click NEXT to continue." The right column contains two sections, one for "Member: MOM" and one for "Member: DAD". Each section asks if the member has a driver's license (yes/no) and what their primary employment status is, with a dropdown menu for selection. Below the "DAD" section is a large "NEXT" button with a right arrow icon. The browser's status bar at the bottom shows "Done" and "Internet".

Household Member Information - Microsoft Internet Explorer

File Edit View Favorites Tools Help

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www.surveycafe.com

HOUSEHOLD TRAVEL SURVEY FOR Volusia County, Florida

INSTRUCTIONS

PART 1 - Driving & Employment Info.

Enter information for each member of your household over the age of 15 then click NEXT to continue.

Member: MOM

Does MOM have a driver's license? ☐ yes ☐ no

What is the primary employment status of this household member?

Click arrow to select employment

If this household member works at least part-time, what is their primary work style?

Click to select work style

Member: DAD

Does DAD have a driver's license? ☐ yes ☐ no

What is the primary employment status of this household member?

Click arrow to select employment

If this household member works at least part-time, what is their primary work style?

Click to select work style

NEXT ➡

Done Internet

Figure 3-8
Household Travel Survey Design
Example Web Instrument Screen – Vehicle Information

Vehicle Information - Microsoft Internet Explorer

File Edit View Favorites Tools Help

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www.surveycafe.com

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HOUSEHOLD TRAVEL SURVEY FOR *Volusia County, Florida*

INSTRUCTIONS

PART 1 - Vehicle Information

Enter information about each vehicle in your household then click NEXT to continue.

Vehicle # 1

① What year is this vehicle? 1999

② What is the body style of this vehicle? Coupe

Vehicle # 2

① What year is this vehicle? 1996

② What is the body style of this vehicle? Minivan

NEXT ➡

Done Internet

Figure 3-9
Household Travel Survey Design
Example Web Instrument Screen – Transit Use Information

Transit Use Information - Microsoft Internet Explorer

File Edit View Favorites Tools Help

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HOUSEHOLD TRAVEL SURVEY FOR *Volusia County, Florida*

INSTRUCTIONS

PART 1 - Transportation Priorities

Answer these questions for your household then click the NEXT button to continue.

① How often do members of your household use public transportation?

☒ daily ☐ seldom

☐ twice a week ☐ never

☐ once a week ☐ other:

☐ once a month

② If you seldom or never use public transportation, select the reasons that most closely describe why you do not use transit. (select all that apply)

☐ cost ☒ travel time

☒ schedule ☐ distance

☐ route ☒ convenience

☐ security ☐ bus stop/transfer location

③ On a scale of 1 to 5 with 5 being very important, how important are each of the following local transportation priorities?

	not at all important	1	2	no opinion	3	4	very important
reducing traffic congestion	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
reducing travel time	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
improving air quality	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
improving the condition of roads and bridges	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
increasing the availability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Done Internet

Figure 3-10
Household Travel Survey Design
Example Web Instrument Screen – Travel Diary Home Page

Travel Diary Home Page - Microsoft Internet Explorer

File Edit View Favorites Tools Help

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www.surveycafe.com

TODAY'S DATE 9/20/2001

WELCOME TO THE HOUSEHOLD TRAVEL SURVEY FOR
Volusia County, Florida

shopping school work errands

Welcome to the Household Travel Survey

PART 2 - Travel Information

Select the household member whose trips you want to describe for 9/20/2001, then click NEXT to continue.

MEMBER	STATUS
<input type="radio"/> MOM	not started
<input type="radio"/> DAD	not started

NEXT ➡

THANK YOU FOR PARTICIPATING IN OUR SURVEY!

Done Internet

Figure 3-11
Household Travel Survey Design
Example Web Instrument Screen – Activity Information

Activity Information - Microsoft Internet Explorer

File Edit View Favorites Tools Help

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www.surveycafe.com

HOUSEHOLD TRAVEL SURVEY FOR *Volusia County, Florida*

INSTRUCTIONS

① For this survey, the survey day begins at 12:00 AM (midnight) on 9/20/2001. Indicate where MOM was at this time.

② Identify all places you visited that required traveling by car, bus, bicycle, or by walking 5 or more minutes. Stops along the way, such as for gas or to drop off a passenger should be listed as separate places.

Example Travel Day

The survey day is 9/20/2001.

① Where did the day begin for MOM? For this survey, the day begins at 12:00 AM (midnight) on 9/20/2001.
☐ Check here if MOM made no trips on this date, then click DONE.

② Indicate every place (or stop) that MOM visited and the time MOM arrived at each location.

Place #	Why was a trip made to this place?	What time did MOM arrive?			
1	<input type="text" value="Drop off passenger"/>	<input type="text" value="7"/>	:	<input type="text" value="00"/>	<input checked="" type="radio"/> AM <input type="radio"/> PM
2	<input type="text" value="Work"/>	<input type="text" value="7"/>	:	<input type="text" value="15"/>	<input checked="" type="radio"/> AM <input type="radio"/> PM
3	<input type="text" value="Pick up passenger"/>	<input type="text" value="5"/>	:	<input type="text" value="00"/>	<input type="radio"/> AM <input checked="" type="radio"/> PM
4	<input type="text" value="Go home"/>	<input type="text" value="5"/>	:	<input type="text" value="30"/>	<input type="radio"/> AM <input type="radio"/> PM
5	<input type="text" value="Click arrow to select"/>	<input type="text" value="7"/>	:	<input type="text" value="00"/>	<input type="radio"/> AM <input type="radio"/> PM
6	<input type="text" value="Click arrow to select"/>	<input type="text" value="7"/>	:	<input type="text" value="00"/>	<input type="radio"/> AM <input type="radio"/> PM

MORE **DONE**

Done Internet

Figure 3-12
Household Travel Survey Design
Example Web Instrument Screen – More Trips?

More Trips? - Microsoft Internet Explorer

File Edit View Favorites Tools Help

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HOUSEHOLD TRAVEL SURVEY FOR *Volusia County, Florida*

MOM's Trip List

- 1 started at Home
- 2 7:00 AM: Drop off passenger
- 3 7:15 AM: Work
- 4 5:00 PM: Pick up passenger
- 5 5:30 PM: Go home

Have you entered all the places that MOM went on the survey day?
Review the list to the left. If you want to make changes or delete something, click the back button on your browser.

If the list at left is correct, choose one of the responses below and click NEXT to continue.

- ☐ There are no more places to report
- ☐ More places will be reported at a later time
- ☐ More places to report now

NEXT ➡

Done Internet

Figure 3-13
Household Travel Survey Design
Example Web Instrument Screen – Find your Location

Find Your Location - Microsoft Internet Explorer

File Edit View Favorites Tools Help

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www.surveycafe.com

HOUSEHOLD TRAVEL SURVEY FOR *Volusia County, Florida*

INSTRUCTIONS

PART 2 - Locate Places

Choose how you want to identify the destination for this trip, then click the NEXT button to continue.

MOM's Trip List

- ✓ started at Home
- 1 7:00 AM: Drop off passenger
- 2 7:15 AM: Work
- 3 5:00 PM: Pick up passenger
- 4 5:30 PM: Go home

The Trip List above shows the arrival time and purpose for MOM's trips.

**MOM - Find end location for trip 1 of 4:
Drop off passenger
Arrived at 7:00 AM**

How would you like to locate the place where this trip ended? If it is outside Volusia County, click a button in the first section. Otherwise, choose one of the search methods. Click NEXT to continue.

Location is outside Volusia County to the...

- ☐ South
- ☐ North
- ☐ West

- ☐ Search on an **address**.
(e.g. 123 Main St., Daytona)
- ☐ Search on a nearby **intersection**.
(e.g. Church and Main, Daytona)
- ☐ Search on a **business** name.
(e.g. Laundromat, Daytona or Al's Laundromat, Daytona)
- ☐ Find it on a **map** (under construction)

NEXT ➡

Done Internet

Figure 3-14
Household Travel Survey Design
Example Web Instrument Screen – Search for Location

Search for Location - Microsoft Internet Explorer

File Edit View Favorites Tools Help

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HOUSEHOLD TRAVEL SURVEY FOR *Volusia County, Florida*

INSTRUCTIONS

Enter the location informaton for the destination of the trip highlighted below, then click NEXT to continue.

MOM's Trip List

- started at Home
- 1 7:00 AM: Drop off passenger
- 2 7:15 AM: Work
- 3 5:00 PM: Pick up passenger
- 4 5:30 PM: Go home

The Trip List above shows the arrival time and purpose for MOM's trips.

MOM - Find start location (Home):

Type in all or part of the business name and the city or zip code. If you know the street address, type it in also. Click NEXT to submit or CHOOSE ANOTHER METHOD to change the search method.

Business Name:

City or zip code:

NEXT ➡

⬅ **CHOOSE ANOTHER METHOD**

Done Internet

Figure 3-15
Household Travel Survey Design
Example Web Instrument Screen – Details about your Trips

Details about your trips - Microsoft Internet Explorer

File Edit View Favorites Tools Help

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HOUSEHOLD TRAVEL SURVEY FOR *Volusia County, Florida*

INSTRUCTIONS

Please answer the questions for the trip that is highlighted below, then click NEXT to continue.

MOM's Trip List

- ✓ started at Home
- 1 7:00 AM: Drop off passenger
- 2 7:15 AM: Work
- 3 5:00 PM: Pick up passenger
- 4 5:30 PM: Go home

The Trip List above shows the arrival time and purpose for MOM's trips.

**MOM - For trip 1 of 4:
Drop off passenger
Arrived at 7:00 AM**

① How long did it take to make this trip? hrs. mins.

② Who made this trip with MOM?

- ☐ MOM traveled alone
- ☐ DAD
- ☒ SIS
- ☒ BRO
- ☐ Other people traveled with MOM (enter number of other people)

③ How did MOM make this trip?

NEXT ➡

Done Internet