

2. As a means of energy conservation, incentives to users of energy-saving modes (e.g., bus or carpool) are preferred by respondents to economic disincentives to people who do not use such modes.

3. Respondents agree that carpooling and bus travel save money and energy, but the majority of them view these modes as impractical for themselves.

4. Travel time and convenience to the traveler are favored over saving money and energy in the choice of a mode of transportation.

5. The majority of respondents thinks it is important to make major improvements to public transportation in southeastern Michigan, but when they were questioned about financing mechanisms, fares paid by passengers and federal government subsidy were the only two financing options favored by a majority of the sample. Thus, the respondents recognize a need for public transportation but feel that someone else should pay for it.

#### CONCLUSIONS

A small-sample, supplemental O-D survey was conducted successfully by using a personal home interview to collect attitudinal and demographic data and a travel diary to collect a 24-h travel record for all household members 5 years old and older. The sample size and distribution were based on the trip-rate variances estimated from 1965 data, with some modifications; a sample of about 2500 households was generated that achieved the desired accuracy of  $\pm 5$  percent error with 90 percent confidence.

The trip rates exhibited from this survey show a 17 percent increase over the rates measured in 1965, which seems to be consistent with other recent surveys measuring trip rates. Within this 17 percent overall increase, a decrease was found in home-based work trips and increases in all other trips, particularly non-home-based trips. It is not clear, however, to what extent these measured increases are the result of real increases in trip-making or are the result of a different survey mechanism (the travel diary), which could be ex-

pected to provide a more accurate picture of trip-making.

The results of the attitude survey are, for the most part, unsurprising but serve to confirm a number of prevailing professional expectations and assessments, particularly in relation to transportation energy and the use of carpools and transit. Two points that deserve particular emphasis are, first, that 68 percent of the sample know very little or nothing about transit in the southeast Michigan region (this percentage does not change when the data area is expanded to the entire region), whereas less than 6 percent consider that they are very familiar with regional transit services and that federal subsidies are seen as the preferred mechanism to fund transportation improvements. This second finding is particularly relevant given current changes in policy occurring at the federal level with respect to transportation funding. It is also noteworthy that lack of knowledge of regional transit services seems to have little impact on the perception that transit improvements are needed; these are favored by almost 90 percent of respondents.

#### ACKNOWLEDGMENT

The opinions, findings, and conclusions expressed in this paper are ours and not necessarily those of the U.S. Department of Transportation, Federal Highway Administration, Urban Mass Transportation Administration, or the State of Michigan.

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## Pilot Testing of Alternative Administrative Procedures and Survey Instruments

IRA M. SHESKIN AND PETER R. STOPHER

Traditionally, pilot surveys have involved pretests of the survey instrument and administrative procedures to be employed in the main survey. Such pilot surveys usually have attempted to pretest a single version of the survey instrument and the administrative procedures and to seek appropriate refinements. By using examples from the Dade County On-Board Transit Survey and a Midwest regional travel survey, it is argued that an important and underused part of a pilot study is comparisons between various alternative administrative procedures or survey-instrument components, in which each alternative is foreseen to have both advantages and disadvantages. The pilot study is likely to provide considerable information on the relative merits of the alternatives tested and will lead to improved design of the final instrument or procedure. Such testing may lead frequently to decisions that can have extensive impacts on response rate, response quality, or survey cost.

Survey research is in many ways as much an art as it is a science. While it is possible to transfer general procedures from one spatial and temporal setting to another, each survey effort is to a large extent unique. Thus, every survey should be preceded by a pilot study (1, p. 205). Often, pilot studies have consisted only of a pretest of the questionnaire, perhaps even administered to a sample not representative of the population to be sampled in the main survey. In a university setting, this usually translates to the testing of the questionnaire on a captive classroom audience; in other settings often only an in-house test is performed. Four reasons may be seen for the employment of cursory pilot studies in most cases. First, it is

possible that some researchers have not recognized the importance of a full-scale pilot study. Second, budgetary constraints often have obviated any large-scale pilot-study effort, frequently because the importance of budgeting for it was not recognized. Third, time considerations may make it infeasible to carry out a pilot study. Fourth, if the survey effort falls under the rules and requirements of the U.S. Office of Management and Budget (OMB), a pilot test on more than 10 people requires OMB approval. This approval is likely to involve sufficient lead time and delays to make a pilot test infeasible for all but extremely large censuses and surveys, which is surely in contradiction to the intent that lies behind the OMB role in survey approvals.

The purpose of this paper is to discuss the need to pretest alternative survey forms and the probable benefits that accrue. The major contention is that if two or more proposed procedures or proposed methods for asking a question are foreseen to have both advantages and disadvantages, both procedures should be tested in a pilot study. The need to test alternative procedures is highlighted by Dillman (2).

#### DADE COUNTY ON-BOARD TRANSIT SURVEY AND MIDWEST REGIONAL TRAVEL SURVEY

The discussion in this paper employs examples from pilot studies designed by us for two transportation surveys: the Dade County On-Board Transit Survey and a Midwest regional travel survey. A brief description of the purposes of each survey and the survey mechanisms follows.

The Dade County On-Board Transit Survey was designed to collect data from a random sample of bus passengers (3). The principal purposes of the survey were to provide the following:

1. A major test of a proposed monitoring and surveillance activity for the Metro Transit Agency (MTA) as called for by the Transportation Development Program (TDP) (4);
2. A partial supplement to the travel data collected by the 1980 census on trips to work and part of a data base for using the census data to update trip-rate estimates for nonwork trips;
3. Needed data on bus ridership in the central business district (CBD) (the current data base is seriously deficient in this part of the matrix);
4. Improved data to MTA for use in adjusting its revenue-based, patronage-estimating formula, particularly as needed after recent changes in transfer policies;
5. Data on the use of media by bus passengers, particularly as it relates to providing riders and potential riders with information on the bus system and the services available;
6. Part of the data needs for a recalibration of the Dade County modal-split model; and
7. Data on the perceptions of riders about the MTA system and specific elements of it and a basis for comparing bus-rider judgments (attitudes) with those of the general population of Dade County; the latter were collected in a separate survey in 1980 by MTA (5).

As is common in most U.S. urban areas, bus riders constitute less than 10 percent of the population of Dade County. Hence, any survey aimed specifically at bus riders would be highly inefficient if the sample were drawn from households, employees, or any other non-travel-specific grouping of the population. Thus, the survey mechanism was designed as an intercept survey of bus passengers. A dual survey mechanism was employed that included a brief form to

be completed on the bus and a longer, take-home, mail-back survey (6).

The Midwest regional travel survey was designed to collect data from a stratified random sample of the population in seven counties. The principal purposes of the survey were to provide the following data:

1. The means of update trip-generation rates and modal-split models,
2. Attitudes of the population toward transportation and energy (7),
3. Attitudes toward possible changes in the transit system, and
4. Preferred methods of obtaining information on carpooling.

The trip-generation and modal-split models to be updated use certain demographic characteristics and income as input variables, so these characteristics must be measured to permit updating to be accomplished. Also, the survey coincided with a period of high unemployment in the southeast Michigan region (mainly connected with a low cycle in the automotive industry). Because of the potential effects of this on tripmaking, detailed information was required on employment status.

The selected survey mechanism was the home-interview survey. Two instruments were used. The first was an attitudinal demographic survey asked of a randomly selected adult household member. The second was a travel log distributed to each household member more than five years old and designed to obtain trip information for a 24-h weekday period.

#### TESTING ALTERNATIVE SURVEY FORMS

##### Dade County On-Board Transit Survey

Frequently, in the design of a survey instrument, two or more ways appear to be potentially useful to ask a given question or set of questions; or there may be several possible ways to request answers, e.g., by using 5-point, 6-point, or 7-point scales on judgmental questions. Similarly, many survey instruments may contain questions that are particularly crucial to the purposes of the survey but that are difficult to ask. For such situations, two or more alternative formats often will be developed for such questions, but choice among them may not be obvious. In either case, the most definitive test of the alternative formats is to use each one as part of the pilot study. To do this, a carefully structured scientific test of each alternative must be developed. An example is described in this section based on a set of problem questions in the Dade County On-Board Transit Survey.

In that survey, questions concerning respondents' perceptions of the times and costs of bus transportation versus alternative modes needed to be asked for purposes of recalibrating the Dade County modal-split model, but all suggested formats for asking these questions were viewed as difficult. Compounding this problem is the fact that bus riders are not a random sample of the population but rather are more likely to be members of specific sociodemographic groups in which problems of comprehension or concentration are likely to be more pronounced. This section describes in more detail the forms (including the alternative formats) used on the pilot study of the Dade County survey and the results obtained.

The survey instrument was designed as a two-part entity. An on-board form (form a) was printed on card stock (to make it easier to fill out while riding a bus) and was designed to be short enough to

Figure 1. Instruction sheet.

**METRO-DADE**  
**TRANSIT SURVEY**

DEAR BUS RIDER,

METRO-DADE WILL SOON BE MAKING MAJOR CHANGES IN THE BUS SYSTEM. YOUR HELP IS NEEDED SO WE CAN MAKE SURE THE NEW BUS SYSTEM WILL SERVE YOU BETTER.

**a** PLEASE FILL OUT FORM **a** NOW AND HAND IT IN BEFORE YOU GET OFF THE BUS.

**b** PLEASE FILL OUT FORM **b** LATER (WHEN YOU HAVE TIME) AND PUT IT IN THE ENVELOPE WE HAVE GIVEN YOU AND MAIL IT BACK. (NO POSTAGE IS NECESSARY)

**a** special thank you!  
WHEN FORM **a** AND FORM **b** HAVE BEEN FILLED OUT AND RETURNED, WE WILL MAIL YOU A PASS FOR FREE RIDES ON METROBUS.

000348 **b** this is form **b**

**a** this is form **a**

fill out on a bus. Although a reply-paid panel was printed on this card so that mail return was possible, the form was designed to be placed in a receptacle at the exit door of the bus or handed back to the survey person. The second part was a longer, take-home form (form b) designed to be completed at home and mailed in in the reply-paid envelope provided. The whole package was stapled and included an instruction page and a letter from the county transportation coordinator (Figure 1). The instruction page explained briefly the purpose of the survey and instructed respondents that form a was to be completed on the bus but that form b was to be done at home and returned by mail. In addition, a free bus-pass incentive was offered to gain cooperation. The back of this page contained helpful county telephone numbers. The letter from the transportation coordinator stated the reasons for the survey and the importance of each person's contribution, reviewed the instructions for filling out the forms, and provided a telephone number for help, comments, or verification that this was a bona fide survey. The entire survey instrument was combined so that, when one looked at the instruction page, a 1-in tab from each of form a and form b showed below the top page. This simplified the problem for the respondent of finding each form. The

major reason for the two-part form was to permit the evaluation of nonresponse bias (6).

In the pilot study, 2158 forms were distributed: 632 (29 percent) of the on-board forms and 380 (18 percent) of the take-home forms were returned, although due to time constraints only 301 of the take-home forms were computerized.

Two versions of the on-board form and three versions of the take-home form were devised. Because a possible "shadow effect" of one questionnaire on another existed, each on-board form (called the on-board short and the on-board long for reasons explained below) was combined in equal numbers with each take-home form (called the take-home short, take-home long, and take-home table). This produced the following six versions of the questionnaire:

1. On-board short/take-home short,
2. On-board short/take-home table,
3. On-board short/take-home long,
4. On-board long/take-home short,
5. On-board long/take-home table, and
6. On-board long/take-home long.

These versions were distributed in a systematic mix to consecutive bus riders as they boarded to assure that, as far as possible, the full range of six survey instruments was distributed at each bus stop.

#### Alternative On-Board Forms

The major purpose of the on-board form was to elicit some response from persons who would not be bothered to take a form home, spend 45 min completing it, and remember to mail it (see Figure 2). Also, reading and writing on a moving bus is very difficult and many persons in Dade County, particularly the elderly, ride the bus for only a few blocks at a time. All these considerations seemed to dictate the use of an on-board form that was as brief as possible.

A competing force, however, was the importance of collecting origin-destination information by trip purpose from as many passengers as possible. Because the response rate would be higher on the on-board form than on the take-home form, the possibility of asking for origin-destination information on the on-board form presented itself. Obtaining such information is not simple because it means asking people for the addresses of their origin and destination as open-ended questions. This can have a number of negative impacts on the survey. First, the length of the document increases significantly (questions 4 and 6 in Figure 2). Second, these questions require writing words while one is on a moving bus rather than simply checking a box or writing one or two numbers on a line. Third, such questions very well may frustrate respondents who do not know the address of their origin or destination and they may simply stop filling out the form. Fourth, any self-administered survey is biased against the illiterate, but a semiliterate person may be able to handle a form on which he or she can read slowly and check boxes. Such a person would experience difficulty with the origin-destination questions.

Thus, it was decided to create two versions of the on-board form: the on-board short and the on-board long. The only difference between the two forms is that the on-board long contains the origin-destination questions. Figure 2 shows the on-board long form. Note that questions 4 and 6 (including the part of question 6 continued on the back of the form) occupy an entire column of the form and increase its length by about 33 percent.

Figure 2. On-board long form.

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

PLEASE HELP US IMPROVE THE BUS SYSTEM BY FILLING OUT AND RETURNING THIS SHORT SURVEY FORM DURING YOUR BUS RIDE. EVEN IF YOU HAVE ALREADY FILLED OUT ONE OF THESE FORMS, PLEASE COMPLETE THIS ONE ALSO. IF YOU HAVE ANY QUESTIONS, OR IF YOU NEED HELP IN FILLING OUT THIS FORM, THE SURVEY PERSON WILL BE GLAD TO HELP YOU.

000293 METROPOLITAN DADE COUNTY: ON-BOARD TRANSIT SURVEY

PLEASE HELP US IMPROVE THE BUS SYSTEM BY FILLING OUT AND RETURNING THIS SHORT SURVEY FORM DURING YOUR BUS RIDE. EVEN IF YOU HAVE ALREADY FILLED OUT ONE OF THESE FORMS, PLEASE COMPLETE THIS ONE ALSO. IF YOU HAVE ANY QUESTIONS, OR IF YOU NEED HELP IN FILLING OUT THIS FORM, THE SURVEY PERSON WILL BE GLAD TO HELP YOU.

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34 35  
36 37  
38 39  
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42 43  
44 45  
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58 59  
60 61  
62 63  
64 65

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL  
POSTAGE WILL BE PAID BY ADDRESSEE  
OFFICE OF TRANSPORTATION ADMINISTRATION  
METRO-DADE TRANSIT BUREAU  
44 WEST PALM BLVD. 3RD FLOOR  
MIAMI, FLORIDA 33134

a this is form a

000293 METROPOLITAN DADE COUNTY: ON-BOARD TRANSIT SURVEY

PLEASE HELP US IMPROVE THE BUS SYSTEM BY FILLING OUT AND RETURNING THIS SHORT SURVEY FORM DURING YOUR BUS RIDE. EVEN IF YOU HAVE ALREADY FILLED OUT ONE OF THESE FORMS, PLEASE COMPLETE THIS ONE ALSO. IF YOU HAVE ANY QUESTIONS, OR IF YOU NEED HELP IN FILLING OUT THIS FORM, THE SURVEY PERSON WILL BE GLAD TO HELP YOU.

1 16  
17 18  
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36 37  
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42 43  
44 45  
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48 49  
50 51  
52 53  
54 55  
56 57  
58 59  
60 61  
62 63  
64 65

1) HOW LONG DID YOU WAIT FOR THIS BUS AT THE BUS STOP? MINUTES

2) DID YOU USE A TRANSFER WHEN YOU GOT ON THIS BUS? YES NO

IF YES, WHAT TYPE OF TRANSFER WAS IT?

BROWARD COUNTY TRANSFER  
MONEY PLUS TRANSFER  
TRANSFER  
FROM WHICH BUS DID YOU TRANSFER?  
WHERE DID YOU GET OFF THAT BUS? RISEN RISEE RISEI RISEJ RISEK

IF NO, HOW MUCH DID YOU PAY WHEN YOU GOT ON THIS BUS?

25¢ STUDENT  
25¢ SENIOR CITIZEN  
50¢ FARE  
75¢ EXPRESS  
FREE PASS

3) HOW DID YOU GET TO THE BUS STOP WHERE YOU GOT ON THIS BUS?

WALKED  
BY CAR DROPPED OFF  
PARKED NEAR THE STOP  
TAXI OR JETNEY  
BICYCLE, MOTORCYCLE, OR MOPED  
OTHER (PLEASE SPECIFY)

4) IF YOU CAME ON ANOTHER BUS, HOW DID YOU GET TO THE STOP WHERE YOU GOT ON THAT BUS?

BY CAR DROPPED OFF  
PARKED NEAR THE STOP  
WALKED  
TAXI OR JETNEY  
BICYCLE, MOTORCYCLE, OR MOPED  
OTHER (PLEASE SPECIFY)

5) HOW LONG DID YOU WAIT FOR THIS BUS?

6) WHEN YOU TRANSFERRED, DID YOU WALK MORE THAN ONE BLOCK TO ANOTHER BUS STOP? YES NO

7) IF YES, HOW FAR DID YOU WALK? BLOCKS

8) WHERE DID YOU START OUT FROM BEFORE GETTING ON THIS BUS?

9) WHERE IS THAT PLACE IN RELATION TO THE BUS STOP?

10) WHERE ARE YOU GOING ON THIS BUS RIDE?

11) HOW FAR IS THAT FROM THE BUS STOP?

12) WILL YOU TRANSFER TO ANOTHER BUS WHEN YOU GET OFF THIS BUS?

13) IF YES, WHAT BUS WILL YOU USE?

14) WHERE WILL YOU GET THAT BUS? PLEASE GIVE NEAREST STREET CORNER OR PLACE NAME

15) STREET CORNER/PLACE

Table 1. Patterns of missing data for on-board form.

Question	Missing Answers			
	On-Board Long Form <sup>a</sup>		On-Board Short Form <sup>b</sup>	
	No.	Percent	No.	Percent
1. Waiting time	47	13.9	26	8.8
2. Transfer?	35	10.4	16	5.4
2. Type fare/transfer	37	10.9	29	9.9
3. Access mode	36	10.7	16	5.4
Avg, 1-3	39	11.5	22	7.4
4a. Origin purpose	37	10.9	NA	
4c. Distance to bus stop	167	49.4	NA	
6a. Destination purpose	47	13.4	NA	
6c. Egress mode	114	33.7	NA	
Avg, 4, 6	91	27.0	NA	
7. Captivity	45	13.3	35	11.9
8. Learn about bus	45	13.3	41	13.9
9. Sex	32	9.5	29	9.9
10. Age	35	10.4	26	8.8
11. Driver's license	55	16.3	32	10.9
12. Residence	74	21.9	49	16.7
Avg, 7-12	48	14.1	35	12.0
Avg, 1-3, 7-12	44	13.1	30	10.2
Avg, 1-12	58	17.1	NA	
Mailing list?	63	18.6	42	14.3
Comments not present	234	69.2	159	54.1

Notes: NA = not available. These questions were not asked on the on-board short form.

<sup>a</sup>No. distributed, 1079; no. of responses, 338; response rate, 31.3 percent.

<sup>b</sup>No. distributed, 1079; no. of responses, 294; response rate, 27.2 percent.

Note also the difficulty of these questions; the respondent must be able to find the antecedents of the demonstrative pronouns in questions 4b, 4c, and 6b.

It is important to note that the alternative of asking the origin-destination questions on the take-home form was used in all cases. Irrespective of the presence of these questions on the on-board form, the origin and destination of the trip were needed on the take-home form as an aid to recall the subject trip and a context-setting device for judgmental questions and questions on alternative modes.

Table 1 shows the results of the pilot study of the two versions. The number of on-board forms distributed was 2158, 1079 of each version. A 31.3 percent response rate (338 returns) was achieved for the on-board long; a 27.2 percent response rate (294 returns) was achieved for the on-board short. Because a fairly large sample (numerically) was obtained, it is possible to make statistical comparisons on some aspects of the responses. Although this is useful to distinguish between chance and systematic occurrences, it is not essential to the use of a well-designed pilot test, where reliance should be placed on qualitative assessments. These two response rates are significantly different at the 5 percent level but not at the 1 percent level ( $Z = 2.09$ ), so the null hypothesis--that the addition of these two questions, although lengthening the form, would not discourage response--cannot be rejected at the 5 percent level.

In addition to the possible implications of the presence of the origin and destination questions on response rate, it is also possible, for reasons stated above, that there may be some effects on the quality of information received on the form. Many aspects of quality are difficult to assess. Thus, the surrogate variable used for judging quality is the percentage of missing answers to each question. It is recognized that this variable does not measure the quality or the accuracy of the information provided. Thus, Table 1 shows the percentage of

respondents omitting answers to each question on each alternative form. In some cases, questions do not appear on Table 1 because the data were not punched in a manner that facilitated distinguishing between missing data and instances where no answer should appear because of a contingency question.

The table shows that although more on-board long forms were returned, the percentage of missing information was clearly greater on the long form. A t-test for examining for a significant difference between the average percentage of missing information for the 10 questions in common between the two forms (questions 1-3 and 7-12) shows ( $t = 1.79$ ,  $\alpha = 0.05$ ) that the average percentage of missing information on the on-board long is significantly greater than on the on-board short. The percentage of missing information is greater both for the questions (1-3) that appear prior to the difficult origin-destination questions (4,6) and for the questions (7-12) that appear subsequently. In addition, the lengthening effect of these questions appears to have significantly reduced the percentage of respondents writing in comments ( $Z = 7.22$ ,  $\alpha = 0.05$ ). One of three explanations is possible. First, because the origin-destination questions lengthened the form by 33 percent, respondents ran out of time and had to get off the bus. Second, respondents tired of filling out the form because it was longer. Third, after struggling to write words while they were on a moving bus for the address questions, respondents were reluctant to try to write words again in the Comments section.

Another problem with the on-board long form was that the origin-destination questions (4 and 6) were not completed well. On the on-board form, 69 percent of the responses included a usable address for the origin of the bus trip (question 4a). On the take-home form, 88 percent provided a usable origin address. This percentage might have been even higher, but no doubt some respondents completing the take-home form probably figured they had already answered the question on the on-board form and decided to skip it on the take-home form. Evidently, respondents who took the time to complete and mail back the rather complicated take-home form were not deterred by the address questions. Thus, even given the lower response rate on the take-home form, a satisfactory number of origin-destination addresses would be received on the final survey if these questions were omitted from the on-board form.

Two interesting sidelights may be noted. The first is the large percentage of missing information on questions 4c and 6c. This pointed to a design flaw in which too little space was left between 4b and 4c and between 6b and 6c, so that respondents read right over these questions. The second is that the contingency aspects of questions 2 and 3 proved too difficult for most respondents. These two questions were simplified and combined on the form for the main survey.

In addition to the tests and comparisons described, the survey designers spent a considerable amount of time reviewing individual questionnaires. They reviewed the consistency of answers among questions and the trips on which forms were given out and tried to obtain a subjective impression of the way in which forms had been completed. These reviews were also used in decisions to change or modify layouts, question-and-answer wordings, and formats.

In sum, the decision was made to produce a revised version of the on-board short form for the main survey. Although a significantly higher response rate (at the 5 percent but not at the 1 percent level) was achieved for the on-board long, the form yielded a significantly higher rate of

missing information and significantly lower rate of comments. Also, tests of the take-home form seemed to yield sufficient origin-destination information for analysis purposes. That the lengthening of the form by 33 percent did not affect the response rate adversely is similar to the results shown below for the testing of alternative take-home forms. Although this result, to some extent, is at odds with conventional wisdom that states that longer forms should achieve lower response rates, it could be that both the long and the short versions of the on-board form were sufficiently short to lie within the tolerance range of the same population groups (2).

#### Alternative Take-Home Forms

One of the major purposes of the take-home form was to collect data to recalibrate the Dade County modal-split model. (See Figures 3-6.) Optimally, disaggregate behavioral modal-split models require individual perceptions of time and cost parameters for a selected mode and one or more alternative modes (8, Chap. 15). Because at least 13 modes can be identified in Dade County, it would obviously be beyond the patience of the vast majority of respondents to provide data on all alternative modes. Thus, an initial decision was made to query perceived time and cost parameters for the bus ride on which the respondents received the form and for three alternative modes. If a respondent provided data on at least one alternative, the response was usable for the modeling. The importance of this information as well as the obvious difficulties of asking questions about alternative modes prompted considerable attention to the modal-split questions.

Thus, three versions of the take-home form were designed. Figures 3-6 show the take-home long form. The take-home short form contains a subset of the questions on the long form (excluding the four sets of 18 mode-specific perceptual questions). The take-home table form asks in a matrix format the mode-specific time and cost questions that are asked as separate questions on the long and short forms. Each of the three versions may be separated into four sections:

Section I was devised as a warm-up section beginning with a set of perceptual questions designed to create interest (questions 1A-1M). Also included is a series of questions for devising marketing strategies (questions 2-5).

Section IV asks for information on education, income, automobile ownership, family structure (relationship, age, sex, driver's license), residential status, employment, and race. Such information is needed both for the Dade County modeling sequence and for federal reporting requirements.

Section II (questions 1-9) asks for detailed information on the bus trip the respondent was making when the form was distributed. This includes information on the land use and the address at the origin and destination, access and egress modes to the bus, and time and cost of the trip. In addition, on the long form, 18 perceptual questions are asked (question 10) about the bus ride on which the respondent received the form.

Section III asks the respondent to select three alternative modes and answer a series of questions, imagining that they had used the alternative modes instead of the bus for the trip on which they received the form. The manner in which these questions are asked varies by the version of the form. For the long form, the respondent is asked to look at a list of 13 modes and cross out the means of travel used on the day he or she received the form. Three alternative modes are then selected by the

respondent to become Travel Means A, Travel Means B, and Travel Means C. The respondent must then be capable of translating his or her choices for A, B, and C to a separate page for each, where detailed questions about times, costs, and frequencies and perceptual questions are asked. (Note that, to conserve space, only the page for Travel Means A is shown in Figure 5. The pages for Travel Means B and C contain the same questions.)

The short form is designed in exactly the same manner as the long form except that the three sets of 18 perceptual questions about the alternative modes are omitted.

The table form (Figure 7) requests the same information as the short form, except that respondents are asked to fill in times, costs, and frequencies for the bus ride and three alternative modes in the cells of a matrix where the 13 modes form the rows and the modal characteristics form the columns.

All three of these formats display potential problems because either following the rather difficult procedure of translating the abstract notion of Travel Means A from one page to another or filling in the cells of a matrix is a difficult task for the bus-riding public, who may not be accustomed to filling out forms. Another difficulty is introduced because it is necessary to request people not accustomed to doing so to think hypothetically about a situation (modal choice) that they may not have thought about a great deal. This applies particularly to transit captives, who, because they lack an automobile, probably have never thought about the time and cost parameters of other modes.

Before the execution of the pilot study, the belief was that each form displayed some significant benefits. If respondents would persevere with the long form, the most information would be obtained. On the other hand, the long form was 10 pages long in comparison with 8 pages for the short form and 6 pages for the table form. If respondents could be shown to complete the matrix satisfactorily, a much shorter and simpler-looking form could be used. If the table proved unsatisfactory and the long form proved long enough to discourage response, the short form might represent the best alternative.

One other advantage of the table form was that it was possible to shade some of the cells in the matrix to indicate that no response should be placed there. On the long and short forms, all the time and cost questions had to be asked for Travel Means A, B, and C. Thus, if the respondent selected, say, walk for Travel Means A, he or she would be asked how much time was spent traveling in vehicles and finding parking. This would certainly serve to confuse some respondents. On the table form, the cells for these questions could be shaded out.

The overall response rate for the take-home form was 16.7 percent; 380 forms were returned of the 2158 distributed. Only 301 forms are included in the analysis because the others arrived too late for processing. Table 2 indicates that 97 of the 719 long forms (13.5 percent) were returned, 84 (11.7 percent) of the short forms, and 120 (16.7 percent) of the table forms. The proportion of table forms returned is significantly greater ( $\alpha = 0.05$ ) than both the proportion of long forms ( $Z = 1.69$ ) and short forms ( $Z = 2.72$ ). This is the expected result given that the table form was two pages shorter than the short form and four pages shorter than the long form. On the other hand, there exist no significant differences between the response rates of the long and short forms ( $Z = 1.03$ ), although it is noteworthy that a greater response rate was achieved for the long form. In sum, if we

Figure 3. Take-home long form: Section I.

**METRO-DADE**  
**SECTION I**  
**METROPOLITAN DADE COUNTY: TRANSIT SURVEY**

WE WOULD LIKE TO KNOW SOMETHING ABOUT YOUR FEELINGS ABOUT MTA (METROBUS) SERVICE HERE IN THE MIAMI AREA. PLEASE THINK ABOUT THE SERVICE YOU HAVE HAD ON MTA (METROBUS) BUSES WHILE YOU ANSWER THE QUESTIONS IN THIS SECTION.

WE HAVE LISTED BELOW A NUMBER OF STATEMENTS THAT MIGHT BE USED TO DESCRIBE A PERSON'S FEELINGS ABOUT MTA (METROBUS) BUS SERVICE. WE WOULD LIKE YOU TO TELL US HOW STRONGLY YOU AGREE OR DISAGREE WITH EACH OF THE FOLLOWING STATEMENTS.

STATEMENT	NOT STRONGLY	AGREE	DISAGREE	NOT STRONGLY
I LIKE THE COLOR OF THE MTA (METROBUS) BUSES	1	2	3	4

THINKING ABOUT METROBUS IN GENERAL, I AM VERY SATISFIED WITH THE SERVICE

HOW WE HAVE A NUMBER OF STATEMENTS ABOUT BUS SERVICE, WHICH WE WOULD LIKE YOU TO ANSWER IN A SIMILAR WAY

STATEMENT	NOT STRONGLY	AGREE	DISAGREE	NOT STRONGLY
MOST BUS DRIVERS ARE POLITE TO THE PASSENGERS	1	2	3	4
HAVING TO WAIT TOO LONG FOR A BUS IS A MAJOR PROBLEM	1	2	3	4
BUS SCHEDULES ARE HARD TO FIGURE OUT	1	2	3	4
YOU CAN RELY MORE IN A BUS THAN IN A CAR	1	2	3	4
YOU CAN USUALLY COUNT ON BUSES TO RUN ON TIME	1	2	3	4

WAITING FOR A BUS IN MIAMI WEATHER IS A BIG PROBLEM

BUS ROUTES GENERALLY SEEM TO GO WHERE I WANT TO GO

CRIME ON THE BUS IS A SERIOUS PROBLEM

BUS ROUTE MAPS ARE HARD TO FIGURE OUT

NEWSPAPER STORIES ABOUT THE BUS SYSTEM ARE FAIR

THE BUS SYSTEM IS GETTING BETTER

THE AGENCY THAT RUNS THE BUS SYSTEM SHOULD DEFINITELY NOT BE ALLOWED TO RUN THE NEW TRAM SYSTEM

WE HAVE LISTED BELOW SOME IDEAS THAT MIGHT BE USED TO GIVE BUS RIDERS INFORMATION ABOUT THE BUS SYSTEM WHICH 3 OF THESE IDEAS DO YOU FEEL ARE THE MOST IMPORTANT?

- BUS SYSTEM INFORMATION CENTERS IN NEIGHBORHOODS
- EXPANDED TELEPHONE INFORMATION
- EXPANDED BILINGUAL TELEPHONE SERVICE
- BETTER DESTINATION SIGNS ON THE OUTSIDE OF THE BUSES
- MORE MAPS, SCHEDULES, AND NEWSLETTERS ON BUSES
- MORE BUS SYSTEM INFORMATION IN NEWSPAPERS
- MORE BUS SYSTEM INFORMATION ADVERTISING ON TV
- A BUS RIDER'S GUIDE THAT TELLS YOU ABOUT BUS FARES, TRANSFER RULES, ETC.
- A POSTED ROUTE MAP AT ALL BUS STOPS
- A POSTED SCHEDULE AT ALL BUS STOPS
- A HOT-LINE MTA INFORMATION PHONE AT MAJOR BUS STOPS
- PERMANENT INFORMATION DISPLAYS AT SHOPPING CENTERS
- DRIVERS WHO WKL GIVE PEOPLE MORE INFORMATION

DO YOU READ A MIAMI NEWSPAPER REGULARLY?

IF YES, WHICH NEWSPAPER DO YOU GET OR READ REGULARLY?

- THE MIAMI HERALD
- MIAMI NEWS
- EL MIAMI HERALD
- DIARIO LAS AMERICAS
- MIAMI TIMES
- NEIGHBORHOOD NEWSPAPER
- COMMUNITY NEWSPAPER
- STUDENT NEWSPAPER
- OTHER (PLEASE SPECIFY)

WHEN YOU READ A NEWSPAPER, WHAT SECTIONS/TOPICS DO YOU READ?

- WORLD AND NATIONAL
- LIVING OR FEATURES SECTION
- SPORTS
- FINANCIAL PAGES
- ARTS AND LEISURE
- COMICS
- DAILY TV PROGRAM SCHEDULE
- LOCAL NEWS
- FOOD TODAY
- EDITORIALS
- NEIGHBORS SECTION
- TROPIC MAGAZINE
- THE WEEKLY TV MAGAZINE
- SPECIAL SUNDAY SUPPLEMENTS
- OTHER (PLEASE SPECIFY)

DO YOU LISTEN TO THE RADIO REGULARLY IN MIAMI?

IF YES, WHICH RADIO STATIONS DO YOU LISTEN TO REGULARLY?

AM	FM
<input type="checkbox"/> WCMG 1220	<input type="checkbox"/> WAAA 87.3
<input type="checkbox"/> WWSB 710	<input type="checkbox"/> WAXY 105.9
<input type="checkbox"/> WWSW 940	<input type="checkbox"/> WCRG 102.7
<input type="checkbox"/> WWSB 610	<input type="checkbox"/> WCMG 92.1
<input type="checkbox"/> WWSB 1490	<input type="checkbox"/> WWSB 99.1
<input type="checkbox"/> WWSB 780	<input type="checkbox"/> WWSB 100.7
<input type="checkbox"/> WWSB 1490	<input type="checkbox"/> WWSB 94.9
<input type="checkbox"/> WWSB 580	<input type="checkbox"/> WWSB 101.5
<input type="checkbox"/> WWSB 1140	<input type="checkbox"/> WWSB 96.3
<input type="checkbox"/> WWSB 1470	<input type="checkbox"/> WWSB 107.5
<input type="checkbox"/> WWSB 1550	<input type="checkbox"/> WWSB 92.9
<input type="checkbox"/> WWSB 1080	<input type="checkbox"/> WWSB 105.1
<input type="checkbox"/> WWSB 1290	

DO YOU WATCH TELEVISION REGULARLY IN MIAMI?

IF YES, WHICH STATIONS DO YOU WATCH REGULARLY?

<input type="checkbox"/> CHANNEL 2 PBS-WPBT	<input type="checkbox"/> CHANNEL 10 ABC-WPFG
<input type="checkbox"/> CHANNEL 4 CBS-WTVJ	<input type="checkbox"/> CHANNEL 6/23 HD-WCLX
<input type="checkbox"/> CHANNEL 7 NBC-WCKT	<input type="checkbox"/> CHANNEL 23 HD-WLTV

OTHER (PLEASE SPECIFY)

GENERALLY, HOW MANY DAYS A MONTH DO YOU RIDE MTA (METROBUS) BUSES WHEN YOU ARE IN MIAMI?

- 30 OR MORE DAYS
- 6 - 19 DAYS
- 1 - 4 DAYS
- LESS THAN 1 DAY
- THIS WAS MY FIRST TIME
- IT VARIES A LOT
- OTHER (PLEASE SPECIFY)

b this is form b 000348

Figure 4. Take-home long form: Section II.

### SECTION II

WE WOULD LIKE TO KNOW SOME DETAILS ABOUT THE BUS RIDE YOU WERE MAKING WHEN YOU GOT THIS SURVEY FORM.

PLEASE THINK ABOUT THAT BUS RIDE WHERE YOU WERE COMING FROM AND GOING TO, WHY, AND SO ON.

PLEASE ANSWER THE FOLLOWING QUESTIONS TO THE BEST OF YOUR MEMORY.

SOME QUESTIONS ARE THE SAME AS THOSE WE ASKED YOU ON THE BUS. EVEN SO, PLEASE GIVE US YOUR ANSWERS AGAIN.

**1. WHERE DID YOU START OUT FROM WHEN YOU MADE THE BUS RIDE ON WHICH YOU GOT THIS SURVEY FORM? (SEE BOX BE FILL)**

HOME <input type="checkbox"/>	SHOPPING <input type="checkbox"/>
WORK <input type="checkbox"/>	A FRIEND/RELATIVE'S HOME <input type="checkbox"/>
SCHOOL <input type="checkbox"/>	HEALTH CARE (DOCTOR/DENTIST/ HOSPITAL/ETC) <input type="checkbox"/>
RESTAURANT <input type="checkbox"/>	RECREATION (BEACH/PARK/THEATER/ MOVIES/SPORTS/ETC) <input type="checkbox"/>
HOTEL/MOTEL <input type="checkbox"/>	OTHER (PLEASE SPECIFY) _____
AIRPORT <input type="checkbox"/>	

**2. WHERE IS THAT PLACE (11) IN THE ADDRESS OR NEAREST STREET CORNER OR IN SQUARE OR PLACE NAME**

STREET / CORNER / BUILDING \_\_\_\_\_

CITY / TOWN / VILLAGE \_\_\_\_\_ ZIP \_\_\_\_\_

**3. HOW DID YOU GET TO THAT ADDRESS FROM THE LAST BUS THAT YOU USED? DID NOT BE FILL**

WALKED  PICKED UP || BY CAR | PARKED NEAR THE STOP |
TAXI OR JITNEY	
BICYCLE, MOTORCYCLE, OR MOPED	
OTHER (PLEASE SPECIFY) \_\_\_\_\_	

**4. AT WHAT TIME DID YOU ARRIVE AT THAT ADDRESS? PLEASE FILL IN THE TIME IN HOURS AND MINUTES**

\_\_\_\_\_ AM  OR PM

HOUR MINUTES

**5. WOULD YOU RATHER THAT THE BUS GOT YOU THERE AT A DIFFERENT TIME?**

NO  YES

**IF YES WHEN WOULD YOU PREFER TO HAVE HAD THE BUS ARRIVE? PLEASE FILL IN THE TIME**

\_\_\_\_\_ AM  OR PM

HOUR MINUTES

**6. ON THE AVERAGE, HOW MANY DAYS A MONTH DO YOU TRAVEL BY BUS BETWEEN THE TWO ADDRESSES YOU HAVE JUST TOLD US ABOUT? (SEE BOX BE FILL)**

20 OR MORE DAYS  15 DAYS | 10 DAYS | 5 DAYS | 1-4 DAYS | LESS THAN 1 DAY THIS WAS MY FIRST TIME | IT VARIES A LOT |

CIRCLE A VALUE

**7. FOR THE BUS RIDE YOU HAVE JUST DESCRIBED, HOW MUCH TIME DID YOU SPEND WALKING TO OR FROM BUS STOPS TO AND FROM BUS STOPS OR FROM A CAR?**

MINUTES OR NONE

**8. HOW MANY HOURS DID YOU SPEND WAITING?**

MINUTES OR NONE

**9. HOW MANY HOURS DID YOU SPEND LEAVING BUS OR IN VEHICLE?**

MINUTES OR NONE

**10. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**11. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**12. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**13. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**14. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**15. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**16. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**17. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**18. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**19. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**20. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**21. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**22. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**23. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**24. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**25. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**26. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**27. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**28. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**29. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**30. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**31. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**32. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**33. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**34. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**35. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**36. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**37. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**38. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**39. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**40. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**41. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**42. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**43. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**44. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**45. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**46. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**47. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**48. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**49. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**50. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**51. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**52. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**53. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**54. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**55. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**56. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**57. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**58. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**59. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**60. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**61. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**62. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**63. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**64. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**65. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**66. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**67. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**68. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**69. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**70. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**71. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**72. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**73. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**74. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**75. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**76. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**77. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**78. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**79. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**80. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**81. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**82. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**83. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**84. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**85. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**86. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**87. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**88. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**89. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**90. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**91. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**92. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**93. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**94. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**95. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**96. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**97. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**98. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**99. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE

**100. HOW MANY HOURS DID YOU SPEND WAITING FOR PARKING?**

MINUTES OR NONE



Figure 5. Take-home long form: Section III.

### SECTION III

**PLEASE READ THE LIST AND CROSS OUT THE TRAVEL MEANS YOU USED ON THE DAY YOU GOT THIS FORM**

1. CAR AND EXPRESS BUS
2. LOCAL BUS AND EXPRESS BUS
3. CAR, LOCAL BUS, AND EXPRESS BUS
4. EXPRESS BUS
5. CAR AND REGULAR (LOCAL) BUS
6. REGULAR (LOCAL) BUS
7. CAR AS DRIVER (ALL THE WAY)
8. CAR AS PASSENGER (ALL THE WAY)
9. CAR POOL (SHARED RIDE)
10. WALK (ALL THE WAY)
11. BICYCLE
12. MOTORCYCLE (OR MOPED)
13. TAXI OR JETNEY

FROM THE TRAVEL MEANS THAT ARE LEFT PLEASE PICK 3 WHICH YOU KNOW FAIRLY WELL (EVEN IF YOU HAVE NOT USED THEM RECENTLY). WRITE THEIR NAMES IN THE SPACES BELOW.

TRAVEL MEANS A \_\_\_\_\_

TRAVEL MEANS B \_\_\_\_\_

TRAVEL MEANS C \_\_\_\_\_

PLEASE GO TO THE FIRST SET OF QUESTIONS AND FILL IN THE NAME OF TRAVEL MEANS A. PLEASE ANSWER THE QUESTIONS ABOUT THAT TRAVEL MEANS (IMAGINING THAT YOU USED IT INSTEAD OF THE BUS RIDE YOU TOLD US ABOUT IN SECTION II).

---

#### TRAVEL MEANS A ...

TRAVEL MEANS A  
\_\_\_\_\_

1. HOW MUCH TIME WOULD YOU SPEND WALKING IF YOU USED TRAVEL MEANS A? (FOR EXAMPLE, WALKING TO AND FROM BUS STOPS OR FROM A CAR) \_\_\_\_\_ MINUTES OR NONE

2. HOW MUCH TIME WOULD YOU SPEND WAITING FOR VEHICLES? \_\_\_\_\_ MINUTES OR NONE

3. HOW MUCH TIME WOULD YOU SPEND TRAVELING IN VEHICLES? \_\_\_\_\_ MINUTES OR NONE

4. HOW MUCH TIME WOULD YOU SPEND LOOKING FOR PARKING? \_\_\_\_\_ MINUTES OR NONE

5. HOW MUCH WOULD YOU HAVE TO PAY FOR PARKING FOR THAT RIDE? \_\_\_\_\_ CENTS OR NOTHING

6. NOT COUNTING PARKING COSTS, HOW MUCH WOULD THE RIDE COST YOU? \_\_\_\_\_ CENTS OR NOTHING

7. HOW MANY TIMES HAVE YOU USED THIS TRAVEL MEANS IN THE PAST 6 MONTHS? \_\_\_\_\_  
DON'T WORRY IF YOU CAN'T REMEMBER EXACTLY. A GOOD GUESS WILL BE VERY HELPFUL TO US.

NUMBER OF TIMES USED IN PAST 6 MONTHS  
\_\_\_\_\_

8. STILL THINKING ABOUT THIS TRAVEL MEANS AND USING IT INSTEAD OF THE BUS FOR THAT BUS RIDE, WE HAVE LISTED BELOW SEVERAL STATEMENTS THAT COULD BE USED TO DESCRIBE THIS TRAVEL MEANS. PLEASE THINK ABOUT EACH STATEMENT AND TELL US WHETHER YOU AGREE OR DISAGREE WITH IT AND HOW STRONGLY (PLEASE CHECK ONE BOX: 1 IS STRONGLY AGREE, 2 IS AGREE, 3 IS SLIGHTLY AGREE, 4 IS SLIGHTLY DISAGREE, 5 IS DISAGREE, 6 IS STRONGLY DISAGREE).

TRAVEL MEANS A	STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	STRONGLY DISAGREE
1. IS TOO HOT OR TOO COLD FOR MY COMFORT	1	2	3	4	5	6
2. INTERRUPTS ME FOR MORE THAN 5 MINUTES	1	2	3	4	5	6
3. DOES NOT GET ME TO MY DESTINATION AT THE TIME I WANT	1	2	3	4	5	6

#### TRAVEL MEANS A ...

TRAVEL MEANS A	STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	STRONGLY DISAGREE
4. IS NOT EXPENSIVE TO USE TO TRAVEL (ON-TOWN)	1	2	3	4	5	6
5. MAKES ME TRAVEL WITH PEOPLE I DO NOT KNOW	1	2	3	4	5	6
6. DOES NOT ALLOW ME TO READ OR WRITE WHILE I TRAVEL	1	2	3	4	5	6
7. HAS UNCOMFORTABLE SEATS	1	2	3	4	5	6
8. MAKES ME WALK ONLY A SHORT TIME (LESS THAN 10 MINUTES)	1	2	3	4	5	6
9. HAS A TRAVEL TIME THAT CHANGES A LOT FROM DAY TO DAY	1	2	3	4	5	6
10. IS NOT LIKELY TO BUFFER FROM VEHICLE BREAKDOWN	1	2	3	4	5	6
11. LETS ME TRAVEL IN PRIVACY	1	2	3	4	5	6
12. HAS A HOBBY, DUMPY RIDE	1	2	3	4	5	6
13. IS LIKELY TO INVOLVE ME IN A TRAFFIC ACCIDENT	1	2	3	4	5	6
14. DOES NOT REQUIRE ME TO MAKE TRANSFERS	1	2	3	4	5	6
15. IS EXPENSIVE COMPARED WITH OTHER MODES OF TRAVEL	1	2	3	4	5	6
16. GIVES ME A FEELING OF SECURITY	1	2	3	4	5	6
17. LETS ME SMOKE	1	2	3	4	5	6
18. IS AVAILABLE, MORE OR LESS WHEN I NEED IT	1	2	3	4	5	6

Figure 6. Take-home long form: Section IV.

**SECTION IV**

WE WOULD LIKE TO KNOW A FEW DETAILS ABOUT THE PEOPLE WHO RIDE MTA (METROBUS) BUSES. YOUR ANSWERS ARE COMPLETELY CONFIDENTIAL AND WILL NOT BE USED FOR ANYTHING OUTSIDE THIS STUDY OF THE BUS SYSTEM.

**PLEASE TELL US THE HIGHEST LEVEL OF EDUCATION YOU HAVE REACHED**

UP TO 6 YEARS OF SCHOOL   
 7-9 YEARS OF SCHOOL   
 10-12 YEARS OF SCHOOL   
 SOME COLLEGE   
 2- YEAR DEGREE   
 BACHELOR'S DEGREE   
 SOME GRADUATE STUDY   
 GRADUATE DEGREE(S)   
 OTHER (PLEASE SPECIFY) \_\_\_\_\_

**HOW MANY MONTHS OF THE YEAR DO YOU SPEND IN THE MIAMI AREA?**

LESS THAN ONE MONTH   
 1-3 MONTHS   
 6-9 MONTHS   
 MORE THAN 9 MONTHS

**HOW LONG HAVE YOU LIVED IN THIS AREA (DID NOT BE BORN HERE)?**

LESS THAN 1 YEAR   
 1-3 YEARS   
 4-6 YEARS   
 7-10 YEARS   
 OVER 10 YEARS

**ARE YOU EMPLOYED NOW?**  NO  YES

**IF YES, IS YOUR JOB:** FULL-TIME  PART-TIME   
 BOTH, FULL AND PART TIME

**DO YOU CONSIDER YOURSELF TO BE:**

HISPANIC  PACIFIC ISLANDER   
 LATIN AMERICAN  BLACK   
 CARIBBEAN ISLANDER  WHITE   
 AMERICAN INDIAN OR ALASKAN NATIVE  OTHER (PLEASE SPECIFY) \_\_\_\_\_

**PLEASE TELL US A FEW THINGS ABOUT THE TRAVEL MEANS LISTED BELOW ARE AVAILABLE TO YOU. AGAIN, PLEASE THINK ABOUT THE BUS RIDE ON WHICH YOU GOT THIS SURVEY FORM.**

PLEASE READ THE LIST OF TRAVEL MEANS, AGAIN, THINKING ABOUT WHICH ONE YOU WOULD LIKE TO USE FOR THAT RIDE.

- CAR AND EXPRESS BUS
- LOCAL BUS AND EXPRESS BUS
- CAR, LOCAL BUS, AND EXPRESS BUS
- EXPRESS BUS
- CAR AND REGULAR (LOCAL) BUS
- REGULAR (LOCAL) BUS
- CAR, AS DRIVER (ALL THE WAY)
- CAR, AS PASSENGER (ALL THE WAY)
- CARPOL (SHARED RIDE)
- WALK (ALL THE WAY)
- BICYCLE
- MOTORCYCLE OR MOPED
- TARI OR STREET

WHICH OF THE TRAVEL MEANS IN THE LIST ABOVE IS THE ONE YOU WOULD LIKE THE BEST FOR THAT RIDE? IS IT THE ONE YOU WOULD LIKE THE BEST FOR THAT RIDE? IS IT THE ONE YOU WOULD LIKE THE BEST FOR THAT RIDE? IS IT THE ONE YOU WOULD LIKE THE BEST FOR THAT RIDE?

THE ONE I LIKE BEST IS: \_\_\_\_\_

WHICH ONE OF THE TRAVEL MEANS WOULD YOU LIKE THE SECOND BEST FOR THAT RIDE?

THE ONE I LIKE SECOND BEST IS: \_\_\_\_\_

AND WHICH ONE WOULD YOU LIKE THIRD BEST FOR THAT RIDE?

THE ONE I LIKE THE THIRD BEST IS: \_\_\_\_\_

**STILL THINKING ABOUT THE BUS RIDE ON WHICH YOU GOT THIS FORM: SUPPOSE THAT NO BUSES WERE RUNNING IN THE MIAMI AREA ON THAT DAY. (THAT MEANS WE ASK YOU TO IMAGINE THAT TRAVEL MEANS 1 THROUGH 6 IN THE LIST ABOVE ARE NO LONGER AVAILABLE.) ARE THERE ANY OTHER TRAVEL MEANS IN THAT LIST (FROM THOSE NUMBERED 7 THROUGH 12) THAT YOU THINK YOU MIGHT HAVE USED INSTEAD OF THE BUS?**

YES  NO

**IF NO, WOULD YOU SAY THAT USING THE BUS WAS THE ONLY WAY YOU COULD HAVE TRAVELED?**

YES  NO

**PLEASE TELL US A FEW THINGS ABOUT THE HOUSEHOLD YOU LIVE IN. WE WOULD LIKE TO KNOW HOW EACH PERSON IS RELATED TO YOU (IF AT ALL).**

PLEASE FILL IN EACH PERSON'S RELATIONSHIP TO YOU, THEIR AGE (OR YOUR BEST GUESS, IF YOU ARE NOT SURE), SEX, AND WHETHER OR NOT THEY HAVE A DRIVER'S LICENSE.

PLEASE DO NOT INCLUDE ANYONE WHO SPENDS LESS THAN 6 MONTHS OF THE YEAR IN YOUR HOUSEHOLD.

PLEASE START WITH YOURSELF AND FILL IN A LINE FOR EACH MEMBER OF YOUR HOUSEHOLD.

RELATIONSHIP	AGE	SEX	DRIVER'S LICENSE
1 MYSELF	<input type="checkbox"/>	<input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
2 _____	<input type="checkbox"/>	<input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
3 _____	<input type="checkbox"/>	<input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
4 _____	<input type="checkbox"/>	<input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
5 _____	<input type="checkbox"/>	<input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
6 _____	<input type="checkbox"/>	<input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
7 _____	<input type="checkbox"/>	<input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
8 _____	<input type="checkbox"/>	<input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
9 _____	<input type="checkbox"/>	<input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
10 _____	<input type="checkbox"/>	<input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
11 _____	<input type="checkbox"/>	<input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
12 _____	<input type="checkbox"/>	<input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
13 _____	<input type="checkbox"/>	<input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
14 _____	<input type="checkbox"/>	<input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
15 _____	<input type="checkbox"/>	<input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
16 _____	<input type="checkbox"/>	<input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
17 _____	<input type="checkbox"/>	<input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
18 _____	<input type="checkbox"/>	<input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
19 _____	<input type="checkbox"/>	<input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
20 _____	<input type="checkbox"/>	<input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>

**HOW MANY PRIVATE MOTOR VEHICLES (CARS, TRUCKS, MOTORCYCLE, ETC.) ARE AVAILABLE TO YOUR HOUSEHOLD IN THE MIAMI AREA?**

NONE  ONE  TWO  THREE  FOUR  FIVE OR MORE

**PLEASE TELL US YOUR APPROXIMATE ANNUAL INCOME BEFORE TAXES, INCLUDING PENSIONS, INVESTMENTS EARNINGS, ETC. FOR THE YEAR.**

PLEASE CHECK THE BOX THAT BEST DESCRIBES YOUR INCOME RANGE.

\$ 0 - \$ 9,999 PER YEAR  \$ 20,000 - \$ 49,999 PER YEAR   
 \$ 10,000 - \$ 19,999 PER YEAR  \$ 50,000 - AND OVER PER YEAR   
 \$ 20,000 - \$ 24,999 PER YEAR

**ALSO, PLEASE TELL US (IF YOU KNOW IT) THE APPROXIMATE AMOUNT OF YOUR HOUSEHOLD'S INCOME BEFORE TAXES, INCLUDING PENSIONS, INVESTMENTS EARNINGS, ETC. FOR THE YEAR.**

PLEASE CHECK THE BOX THAT BEST DESCRIBES YOUR INCOME RANGE.

\$ 0 - \$ 9,999 PER YEAR  \$ 20,000 - \$ 49,999 PER YEAR   
 \$ 10,000 - \$ 19,999 PER YEAR  \$ 50,000 - AND OVER PER YEAR   
 \$ 20,000 - \$ 24,999 PER YEAR

\*\*\*\*\* THANK YOU FOR YOUR HELP \*\*\*\*\*

IF YOU HAVE ANY COMMENTS ON TRANSPORTATION IN DADE COUNTY, OR ON THIS SURVEY, PLEASE USE THE NEXT PAGE TO WRITE YOUR COMMENTS. WE APPRECIATE THE OPPORTUNITY TO HEAR FROM YOU.

PLEASE PLACE YOUR COMPLETE SURVEY FORM IN THE BUSINESS-REPLY ENVELOPE THAT WE PROVIDED FOR YOU AND DROP IT IN ANY MAIL BOX. NO POSTAGE IS NECESSARY.

IF YOU HAVE LOST THE ENVELOPE, PLEASE SEND THIS FORM TO:

OFFICE OF TRANSPORTATION ADMINISTRATION  
 METRO-DADE TRANSIT SURVEY  
 44 WEST FLAGLER ST., 10th FLOOR  
 MIAMI, FLORIDA 33130

Figure 7. Matrix page.

**1** ON THE AVERAGE HOW MANY DAYS A MONTH DO YOU TRAVEL BY BUS BETWEEN THE TWO ADDRESSES YOU HAVE JUST TOLD US ABOUT?  
SEE SEE BELOW

DO OR MORE DAYS

6-10 DAYS

1-4 DAYS

LESS THAN 1 DAY

THIS WAS MY FIRST TIME

IT TAKES A LOT

(WRITE NAME HERE)

**2** THIS QUESTION ASKED YOU TO DESCRIBE SOME FEATURES OF TRAVELING BY DIFFERENT TRAVEL MEANS.

SEVERAL TRAVEL MEANS ARE LISTED IN THE LEFT COLUMN OF THE FOLLOWING TABLE.

THE OTHER COLUMNS OF THE TABLE HAVE SOME TRAVEL FEATURES.

PLEASE THINK ABOUT THE BUS RIDE YOU HAVE BEEN TELLING US ABOUT AND FILL IN THE CORRECT LINE OF THE TABLE FOR THAT BUS RIDE.

ALSO, PICK ANY 2 OF THE OTHER TRAVEL MEANS IN THE TABLE THAT YOU ARE MOST FAMILIAR WITH, EVEN IF YOU HAVE NEVER USED SOME OF THESE. RANKED WHAT IT WOULD BE LIKE TO TRAVEL BY EACH ONE OF THE THREE FOR THE BUS RIDE YOU HAVE BEEN TELLING US ABOUT.

FOR EACH OF THE THREE TRAVEL MEANS YOU HAVE PICKED, FILL IN THE CORRECT LINE OF THE TABLE, TELLING US THE TIME, COST, AND HOW OFTEN YOU HAVE USED EACH ONE IN THE MEAN AREA IN THE PAST 6 MONTHS. PLEASE SEE 11 FOR THE INSTRUCTIONS.

TRAVEL MEANS	TIME SPENT (MINUTES)				COST (CENTS)		NUMBER OF TIMES USED IN PAST SIX MONTHS		
PICK FOUR, INCLUDING THE ONE RIDER YOU GOT THIS SURVEY FORM!	WALKING	WALKING IN THE STREET	WALKING THROUGH PARKS	PARADOX	PARADOX	PARADOX	WALKING ON TRUCK	WALKING IN THE STREET	WALKING THROUGH PARKS
CAR AND EXPRESS BUS									
LOCAL BUS AND EXPRESS BUS									
CAR, LOCAL BUS, AND EXPRESS BUS									
EXPRESS BUS									
CAR AND REGULAR (LOCAL) BUS									
REGULAR (LOCAL) BUS									
CAR, AS DRIVER									
CAR, AS PASSENGER (NOT A CARPOOL)									
CARPOOL (SHARED RIDE)									
WALK ALL THE WAY									
BICYCLE									
TAXI OR JETTY									
MOTORCYCLE OR MOPED									

NOTE: YOU SHOULD HAVE FILLED IN FOUR LINES OF THE TABLE. THANK YOU. PLEASE GO ON TO THE NEXT QUESTION.

consider only the response rates, the table form appears best.

The quality of the information on each form, however, as measured by the percentage of missing answers for each question, leads to a different conclusion (Table 2). On the table form, an average of 39 percent of the data is missing compared with 31.9 percent for the short form and 30 percent for the long form. Although no significant differences exist ( $\alpha = 0.05$ ) between the average percentage missing on the short and long forms ( $t = 0.481$ ) or table and short forms ( $t = 1.452$ ), there is a significantly higher average percent missing on the table form than on the long form ( $t = 1.92$ ). Thus, it would appear that, while the brevity of the table form induced a significantly greater percentage of persons to fill out the form, respondents obviously experienced difficulties with some of the questions.

Examining the percentage of missing information on various portions of the questionnaire reveals some insights into various aspects of questionnaire design and suggests some needed changes in the take-home form.

The attitude and marketing questions (Table 2) on pages 1 and 2 of the questionnaire were filled out relatively well on all three forms; 7.8 percent of respondents omitted answers to the attitude questions and 10.3 percent, to the marketing questions. In both cases, the long form has the least missing information, the short form the most, and the table an intermediate rate, although the differences in the rates are not great. An interesting sidelight is the unusually large number of respondents (27.9 percent) who did not answer question 1K about their perception of the fairness of newspaper stories on transit. Evidently many persons felt unqualified to answer, perhaps because they had not read any newspaper stories on the bus system.

Beginning with the bus trip parameters (Table 2) and continuing through the Means C times and costs, the superiority of the long form and the overwhelm-

ing problems of the table form become clear. For each group of questions, the average percentage of missing information on the table form is between 43 percent and 55 percent higher than on the long form. Also, in each case, the percentage of missing information on the short form is strikingly higher than on the long form. Two explanations for the lack of response to the questions in the matrix on the table form are possible. First, it is probable that many respondents were simply incapable of following instructions for the matrix and filling it in. Second, the instructions for the matrix occupy almost an entire column of the form and the matrix itself takes up one column (Figure 7). The table form contained 12 columns of questions. Respondents might have felt that it was not worth trying to figure out the matrix when it was only one question on the form, and anyway they had done their duty by answering the other questions.

There is an obvious explanation for the somewhat better results from the long form than the short form in spite of its greater length: The presence of the perceptual questions sparked respondents' interest in the form.

Again, in addition to the numerical and statistical analysis, individual forms were scrutinized carefully to look for a variety of possible indicators for change and for instrument selection. A common problem with subjective scaling questions is either receiving the same scale position selected for every statement or receiving the same ratings on each mode for a given statement. Various other more subtle patterns may also indicate that a respondent opted not to make individual and, at least partly, independent judgments on each statement. These were looked for together with illogical or improbable responses to other quantitative and qualitative questions. This scrutiny, which took place while the numerical and statistical results were being developed, pointed initially to the superiority of the long form, which was subsequently confirmed by

Table 2. Patterns of missing data for take-home form.

Question	Missing Answers					
	Table <sup>a</sup>		Short Form <sup>b</sup>		Long Form <sup>c</sup>	
	No.	Percent	No.	Percent	No.	Percent
<b>Attitude</b>						
1A. Satisfied with service	7	5.8	4	4.8	5	5.2
1B. Drivers polite	3	2.5	2	2.2	3	3.1
1C. Wait is problem	3	2.5	6	7.1	6	6.2
1D. Schedules difficult	7	5.8	6	7.7	6	6.2
1E. Relax in bus	5	4.2	3	3.6	5	5.2
1F. Bus on time	6	5.0	2	2.4	2	2.1
1G. Weather is problem	3	2.5	7	8.3	3	3.1
1H. Routes go where want	3	2.5	2	2.4	6	6.2
1I. Crime is problem	10	8.3	9	10.7	12	12.4
1J. Maps difficult	9	7.5	NA	NA	8	8.2
1K. News unfair	27	22.5	43	51.2	14	14.4
1L. Bus getting better	11	9.2	5	6.0	7	7.2
1M. Bus company runs trains	19	15.8	11	13.1	9	9.3
Avg, attitude	8.7	7.2	8.3	9.9	6.6	6.8
<b>Marketing</b>						
2. First idea	7	5.8	10	11.9	9	9.3
2. Second idea	10	8.3	11	13.1	10	10.3
2. Third idea	12	10.0	15	17.9	13	13.4
3. Read newspaper	15	12.5	9	10.7	8	8.2
4. Listen radio	18	15.0	10	11.9	7	7.2
5. Watch television	14	11.7	4	4.8	3	3.1
Avg, marketing	12.7	10.6	9.8	11.7	8.3	8.6
6. Frequency use bus	9	7.5	3	3.6	3	3.1
<b>Bus trip parameters</b>						
1A. Origin land use	2	1.7	4	4.8	4	4.1
1C. Access mode	4	3.3	3	3.6	2	2.1
2A. Destination land use	2	1.7	2	2.4	1	1.0
2C. Egress mode	15	12.5	19	22.6	5	5.2
2E. Rather arrive other time	21	17.5	15	17.9	14	14.4
3. Frequency make trip	49	40.8	8	9.5	8	8.2
Avg, bus trip parameters	15.5	12.9	8.5	10.1	5.7	5.8
<b>Bus trip times and costs</b>						
4. Time walking	61	50.8	15	17.9	9	9.3
5. Time waiting	55	45.8	10	11.9	8	8.2
6. Time in vehicles	60	50.0	29	34.5	26	27.0
7. Time looking for parking	99	82.5	51	60.7	46	47.4
8. Pay for parking	100	83.3	51	60.7	48	49.5
9. Cost of ride	88	73.3	35	41.7	35	36.1
Avg, bus trip times and costs	77.2	64.3	31.8	37.9	28.7	29.6
<b>Alternative modes<sup>d</sup></b>						
Cross out mode used	38	31.7	17	20.2	13	13.4
Named Means A	65	54.2	26	31.0	24	24.7
Named Means B	76	63.3	43	51.2	35	36.1
Named Means C	86	71.7	48	57.1	41	42.3
Avg, alternative modes	66.3	55.2	33.5	39.9	28.3	29.1
<b>Means A times and costs</b>						
1. Time walking	88	73.3	32	38.1	22	29.1
2. Time waiting	90	75.0	NA	NA	31	32.0
3. Time in vehicles	78	65.0	NA	NA	30	30.9
4. Time looking for parking	100	83.3	50	59.5	40	41.2
5. Pay for parking	105	87.5	55	65.5	42	43.3
6. Cost of trip	101	84.2	44	52.4	41	42.3
Avg, Means A times and costs	93.7	78.1	45.3	53.9	34.3	35.4
<b>Means B times and costs</b>						
1. Time walking	90	75.0	46	54.8	36	37.1
2. Time waiting	101	84.2	54	64.3	41	42.3
3. Time in vehicles	83	69.2	54	64.3	45	46.4
4. Time looking for parking	98	81.7	54	64.3	46	47.4
5. Pay for parking	106	88.3	58	69.0	49	50.5
6. Cost of trip	104	86.7	56	66.7	49	50.5
Avg, Means B times and costs	97.0	80.8	53.7	63.9	44.3	45.7
<b>Means C times and costs</b>						
1. Time walking	95	79.2	55	65.5	46	47.4
2. Time waiting	105	87.5	57	67.9	49	50.2
3. Time in vehicles	95	79.2	56	66.7	51	52.6
4. Time looking for parking	110	91.7	61	72.6	32	33.0
5. Pay for parking	113	94.2	61	72.6	54	55.7
6. Cost of trip	109	90.8	58	69.0	50	51.5
Avg, Means C times and costs	104.5	87.1	58.0	69.0	47.0	48.4
<b>Mode preference and captivity</b>						
B. First preferred mode	24	20.0	21	25.0	53	54.6
B. Second preferred mode	30	25.0	27	32.1	57	58.8
B. Third preferred mode	42	35.0	31	36.9	59	60.8
C. Other modes might use	38	31.7	29	34.5	55	56.7
C. Bus only way	66	55.0	43	51.2	75	77.7
Avg, mode preference and captivity	40.0	33.3	30.2	36.0	59.8	61.6

Table 2. Continued.

Question	Missing Answers					
	Table <sup>a</sup>		Short Form <sup>b</sup>		Long Form <sup>c</sup>	
	No.	Percent	No.	Percent	No.	Percent
Socioeconomic						
1. Education	20	16.7	11	13.1	41	42.3
2. Months in Miami	54	45.0	42	50.0	65	67.0
3. Length of residence	19	15.8	14	16.7	49	50.5
4. Ethnic group	16	13.3	10	11.9	45	46.4
5. Age of respondent	12	10.0	20	24.0	46	47.4
5. Sex of respondent	10	8.3	18	21.4	46	47.4
5. Driver's license	18	15.0	20	23.8	45	46.4
6. Number of automobiles	6	5.0	16	19.0	48	49.5
7. Personal income	35	29.2	35	41.7	51	52.6
8. Household income	51	42.5	41	48.8	61	62.9
Avg, socioeconomic	24.1	20.8	22.7	27.0	49.7	51.2
Made comments	86	71.7	72	85.7	85	87.6
Overall avg	46.8	39.0	26.8	31.9	29.1	30.0

Notes: NA = not available. For exact wording and context of each question, see questionnaire, Figures 3-6.

<sup>a</sup>No. distributed, 719; no. of responses, 120; response rate, 16.7 percent.

<sup>b</sup>No. distributed, 719; no. of responses, 84; response rate, 11.7 percent.

<sup>c</sup>No. distributed, 719; no. of responses, 97; response rate, 13.5 percent.

<sup>d</sup>For the table form, the respondent identified these variables by filling out the rows of the matrix.

the quantitative analysis. In addition, it suggested some useful rewordings of both questions and answers and some format changes.

All these factors then pointed toward a decision to use the long form for the main survey. Two factors, however, indicated the need to make a significant modification by eliminating Travel Means C from the survey form. First, it may be noted that for all three forms (Table 2), as one looks from the questions about times and costs for the bus trip through these same questions for Travel Means A, B, and C, the percentage of missing information increases. On the long form, for instance, the percentages increase from 29.6 to 35.4 to 45.7 to 48.4. Additional evidence of this "dropping out" of respondents who evidently tired of answering the same set of questions over and over again is shown in Table 3. The percentage of missing information on the perceptual questions increases from 16.4 to 29.0 to 38.8 to 48.4 as one proceeds from This Bus Trip to Travel Means C.

The second reason for removing Travel Means C from the final version of the questionnaire was the shadow effect of the length of the modal-split questions on the completeness of the questions that followed the modal-split section. Note that for the questions about mode preference and captivity and the socioeconomic questions, the percentage of missing information on the long form is substantially greater than that for the short or table form. Evidently, when respondents tired of the modal-split questions, they did not look to see what came next but were probably sufficiently deterred by the length of the questionnaire that they simply placed it in the envelope for mailing. In fact, this effect was so severe that the missing information on the long form is of the order of twice the percentage on the short and table forms. Some slight effect is seen also in the lower percentage of respondents who wrote comments on the long form. An interesting, but not unexpected, sidelight is the large percentage of persons not responding to the income questions.

A third reason for eliminating Travel Means C was the feeling that doing so might encourage higher response rates to Travel Means A and B. That is, the respondent who, for example, worked his or her way through the questions about the bus trip and Travel Means A might have had a negative reaction to filling out the questions twice more. By reducing

the repetition from four times to three, it was hoped to persuade more respondents to persevere and complete the form.

In sum, then, although the table form resulted in a significantly higher response rate, the long form was completed best by the respondents. The length of the long form, however, did result in some negative effects: a drop-off rate in answering the modal-split questions and a lower likelihood of completion of the questions following the modal-split questions. For these reasons, the final decision was to use the long form modified by the elimination of Travel Means C.

Thus, some very positive and, in the long run, cost-saving measures were learned from the rather extensive pilot study of the on-board and take-home forms. More important, a small in-house pretest on secretarial staff of the the table form had failed to uncover the full extent of the problem revealed in the pilot study. Had a decision been made to pretest just the table form on the pilot study, the problem would have been discovered and another pilot study would have been necessary to test the long and the short forms. Even worse, had a decision been made on the basis of an in-house pretest to use the table form, the expensive main survey might have failed to generate data of sufficient quality to support the modeling effort.

#### Midwest Regional Travel Survey

Additional advantages of performing an extensive pilot study of the survey instruments are shown by experiences on the Midwest survey. Two alternative forms and two alternative survey mechanisms were tested. The two issues to be decided involved the procedure for querying occupation and which of the two surveys (the home-interview attitude survey or the travel logs) should precede the other.

Conventional wisdom in survey research (1,9,10) indicates that asking respondents for occupational information should be done as an open-ended question with a sufficient degree of probing until the interviewer is satisfied that he or she has obtained enough information to permit a coder to categorize the respondent correctly. Three problems exist with this procedure. First, it relies on the ability of the interviewers to probe successfully. Second, the person coding the answers does not have access to the respondent (except with the trouble of a phone

Table 3. Patterns of missing data for mode-specific perceptual questions (take-home long form).

Question <sup>a</sup>	Missing Answers <sup>b</sup>							
	This Bus Trip		Travel Means A		Travel Means B		Travel Means C	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
1. Too hot or cold	12	13.4	27	27.8	36	37.1	44	45.4
2. Wait 5+ min	10	10.3	26	26.8	35	36.1	45	46.4
3. Get there on time	12	12.4	28	28.9	35	36.1	44	45.2
4. Expensive to CBD	16	16.5	29	29.9	37	38.1	46	47.4
5. Travel with strangers	16	16.5	30	30.9	36	37.1	48	49.5
6. Not allowed to read/write	18	18.6	27	27.8	36	37.1	47	48.5
7. Uncomfortable seats	15	15.5	26	26.8	38	39.2	46	47.4
8. Walk under 10 min	16	16.5	25	25.8	41	42.3	46	47.4
9. Time varies	18	18.6	30	30.9	39	40.2	49	50.5
10. Breaks down	15	15.5	28	28.9	37	38.1	50	51.5
11. Travel in privacy	18	18.6	28	28.9	39	40.2	47	48.5
12. Noisy, bumpy ride	18	18.6	27	27.8	38	39.2	47	48.5
13. Traffic accident	18	18.6	31	32.0	38	39.2	50	51.5
14. Transfers needed	17	17.5	27	27.8	37	38.1	46	47.4
15. Expensive	15	15.5	28	28.9	37	38.1	47	48.5
16. Security	14	14.4	28	28.9	35	36.1	46	47.4
17. Smoking allowed	23	23.7	32	33.0	47	48.5	52	53.6
18. Availability	14	14.4	29	29.9	36	37.1	45	46.4
Overall avg	15.9	16.4	28.1	29.0	37.6	38.8	46.9	48.4

<sup>a</sup>For the exact wording and context of each question, see questionnaire, Figures 3-6.

<sup>b</sup>Based on the 97 returned take-home long questionnaires.

Figure 8. Response cards for job and occupation.

**JOB CATEGORIES**

- A. MANUFACTURING OF TRANSPORTATION EQUIPMENT
- B. OTHER MANUFACTURING
- C. AGRICULTURE, FORESTRY AND FISHERY
- D. MINING
- E. BUSINESS SERVICES AND REPAIR SERVICES
- F. PROFESSIONAL AND RELATED SERVICES
- G. WHOLESALE OR RETAIL TRADE
- H. FINANCE, REAL ESTATE OR INSURANCE
- I. TRANSPORTATION, COMMUNICATIONS, UTILITIES
- J. CONSTRUCTION
- K. ENTERTAINMENT OR RECREATION SERVICES
- L. GOVERNMENT
- M. OTHER (Please Describe)

---

**OCCUPATION TYPES**

- A. PROFESSIONAL OR TECHNICAL
- B. FARMER OR FARM MANAGER
- C. FARM LABORER OR FARM FOREMAN
- D. OTHER LABORER
- E. MANAGER, OFFICIAL, OWNER OF A BUSINESS
- F. CLERICAL AND SIMILAR WORKERS
- G. SALES
- H. CRAFTSMAN OR FOREMAN AND SIMILAR WORKERS
- I. EQUIPMENT OPERATOR OR MOTOR VEHICLE OPERATOR
- J. PRIVATE HOUSEHOLD WORKER (MAID, BUTLER, ETC.)
- K. OTHER SERVICE WORKER
- L. MILITARY
- M. OTHER (Please Describe)

Thus, a second procedure also was pretested in the pilot study. Response cards (Figure 8) were handed to the respondent with answers to each of the occupation questions. The respondent was then asked to classify himself or herself with some degree of assistance from the interviewer. Interviewers were instructed to make liberal use of the "Other" category when necessary. Note that the categories employed are those used by the U.S. Census Bureau, with some minor wording modifications. One advantage of this procedure is that the respondent is providing his or her perception of his or her occupation. Another advantage is that, because census categories are used, the main survey can be checked against the census for response bias.

At a debriefing session of the interviewers for the pilot study, the interviewers were unanimous in the opinion that the response cards should be used. Both the interviewers and interviewees were reported to have an easier time getting to what the interviewers described as more realistic answers when they employed the cards. Thus, the second procedure was adopted for the main survey.

As mentioned above, the Midwest survey consisted of an attitude survey of one randomly selected respondent and travel logs for each household member older than five years. Two possibilities existed for performing the survey:

Procedure 1: Distribute the travel logs, make an appointment to pick up the travel logs, and then do the attitude survey when picking up the travel logs (travel log first, interview after); or

Procedure 2: Do the attitude survey, distribute the travel logs, and make an appointment to pick up the travel logs (interview first, travel logs after).

Procedure 1 had the following advantages. Because the attitude survey was of very limited utility unless the travel logs were completed and a high percentage of refusals to complete the travel logs was expected, time would not be spent on the attitude survey unless the travel logs were complete. It also would permit the interviewer to probe more easily for completion and correct interpretation of the travel logs. Procedure 2, on the other hand, would permit some rapport between the interviewer and the interviewee to develop during the course of

call). Third, asking a respondent for both job type (agriculture, business, government, etc.) and work type (professional, manager, clerical, sales, etc.) as open-ended questions can lead to confusion as to the meaning of the questions.

the interview. It might then be expected to be easier to convince the household to take and complete the travel logs.

Both procedures were pretested in the pilot study in which 138 households were contacted. There were 41 nonresponses, including 17 outright refusals, 1 termination, and 23 "no answers." Of the remaining 97 households, half were given travel logs first (Procedure 1); half, interviews first (Procedure 2). As shown below, Procedure 2 was clearly superior.

<u>Response</u>	<u>Percent</u>
Procedure 1	
Refusal of travel log	53
Refusal of interview	5
Completion rate	42
Procedure 2	
Refusal of interview	27
Refusal of travel log	4
Completion rate	69

When presented with the travel logs first, 53 percent of respondents refused to take them compared with a 4 percent refusal rate when the interview was done first. Evidently it is necessary to build up rapport prior to asking respondents to participate in something that, on the surface, appears to be a difficult task. Note also that, in both procedures, once respondents had complied with whatever form was presented first, very low refusal rates (4 and 5 percent) were experienced for the other form.

#### CONCLUSION

The benefits of testing alternative survey forms when logical arguments concerning the advantages and disadvantages of each form can be offered have been discussed. Two pilot studies designed by us--an on-board survey in Dade County and a regional travel survey in the Midwest--have been used as examples.

This paper has concentrated on one specific aspect of designing surveys and undertaking pilot studies to illuminate and inform the design process. This aspect, frequently ignored in past transportation surveys, is to test alternative designs of questions, survey instruments, or administration procedures of the survey. In the case studies illustrated, a combination of qualitative judgments and scrutiny of returned survey forms and numerical comparisons and tests was used to seek distinctions in effectiveness of the alternatives tested. In the case of the Dade on-board survey, a sufficient sample size was obtained to permit a number of statistical tests of difference between designs. This was useful to support the qualitative judgments but is not essential to the success of the strategy.

In general, pilot studies are constrained to very small samples. Considerable care and attention must be paid to the sampling for useful results to be obtained from such samples; they must be selected carefully and randomly from the same population from which the final sample will be drawn, alternative instruments or procedures must be distributed completely randomly, and all aspects of the survey must be conducted as closely as possible to the expected design of the final survey. Provided that this is done, the small sample will still provide very useful information, even if it is too small to allow statistical comparisons such as those used in the Dade County case study. A good rule of thumb seems to be to aim for a minimum of 50 responses for each alternative tested. If little or no difference,

qualitatively and quantitatively, is found between such subsamples, the selection among the tested alternatives is probably not of major significance to the survey results. If large differences are found (even if they cannot be tested statistically), a good basis is provided to select one alternative over another.

In the illustrated case studies, it is apparent that without a pilot study, decisions on the alternative designs and procedures would be likely to have led to significantly lower response rates, less complete responses, or higher cost surveys than was the case after the pilot study results were used. However, the prohibitive effect of current OMB regulations on conducting such pilot studies for surveys covered by these regulations must be noted and should be a matter of major concern to those committed to improving the quality and usefulness of transportation data collection.

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