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Metropolitan Dade County General Travel Survey Design and Sampling Plan

CUTR

METROPOLITAN DADE COUNTY
GENERAL TRAVEL SURVEY DESIGN
AND SAMPLING PLAN

Final Report

Prepared for

Metropolitan Dade County

By

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INTRODUCTION

Metropolitan Dade County (Metro-Dade) is seeking to update its travel demand models, specifically the mode choice module. This report presents a review of techniques and questionnaires used in recent travel surveys in major metropolitan areas of the United States, a description of the proposed sampling plan for the Metropolitan Dade County travel survey, and a discussion of the procedures involved in administering the survey. A draft version of the general travel survey instrument is also included. This report is in accordance with Work Order No. 2, Tasks 2, 4A, 4B,and 5 of the interlocal agreement between the University of South Florida and Metropolitan Dade County.

The Center for Urban Transportation Research has reviewed survey instruments and data collection and analysis procedures used in recent regional travel surveys across the United States. This review examined survey instruments and protocol in San Francisco, Chicago, Los Angeles, Seattle, St. Louis, Boston, Minneapolis-St. Paul, Philadelphia, and Portland, OR, with particular emphasis on the first three metropolitan areas. Objectives of this review included:

- to determine the purpose and general approach used for conducting the survey;
- to explore sampling techniques;
- to examine survey and analysis procedures;
- to identify data items included in travel surveys;
- to evaluate the form and placement of survey questions;
- to gather information on the cost of these surveys.

The organization of this report closely follows these objectives. After this introductory section, methods for conducting travel surveys will be reviewed. The next section addresses sampling issues, followed by a section on survey and analysis procedures. Types of data sought and questions asked are then discussed, and costs of the surveys are reviewed. Appendix A contains draft versions of a proposed trip diary and instructions, while Appendix B provides draft scripts for telephone interviews. The trip diary and scripts contained in the appendices were developed using examples from previous studies cited in the bibliography.

SURVEY TECHNIQUES

This section of the report addresses several basic issues involved in conducting a travel survey. These surveys generally involve a diary of some sort for the respondent to keep track of all trips taken over the period of the survey. Recall of trips made on a previous day has not generally been found satisfactory.

In the early days of transportation planning, it was common to carry out thousands of interviews in homes around the metropolitan area. Since that time, more cost-effective survey techniques have increased in popularity. The two most common alternate methods are a telephone survey and a self-administered mail-back survey. Hybrids of these two types of surveys have emerged in recent years. The two survey techniques considered here are a self-administered mailout/mailback survey and a telephone/mailout/telephone survey. These are described below in greater detail.

The self-administered mailout/mailback survey is designed to be filled out by the respondent and mailed back postage-free to the agency. In Chicago, this method is supplemented by follow-up telephone calls. This requires asking respondents to provide their names and telephone numbers on the survey. A series of mailings are actually done in this method.

1. The first mailing includes introductory letters explaining the nature of the survey and emphasizing the importance of cooperation in completing it. This mailing is done two weeks in advance of the survey date.

2. The second mailing contains the travel diaries (or trip forms), a household survey to obtain demographic information, a cover letter, instructions and return envelopes.

3. The third mailing, five days after the survey date, is a reminder letter. One agency estimates that the follow-up mailing can increase the number of responses by between 12 and 22 percent. If the respondent is asked to provide a telephone number, a follow-up call can be made in the event of discrepancies in the travel data reported.

The telephone/mailout/telephone survey includes an initial telephone call to ascertain willingness to participate in the survey, and a final telephone call to collect the data recorded in the diaries. The sequence of events is defined in the following steps.

1. The initial telephone call seeks participation in the survey and collects household demographic data.

2. Once a respondent agrees to participate, the travel diary is then mailed with instructions and an endorsement letter (verifying that the survey is legitimate) to the address given over the telephone. The respondent and other members of the household fill out the diary on the appropriate day (given over the telephone and also contained in the survey instructions). In some cases, a "reminder" call is made the night before the household's assigned travel day.

3. One or two days after the travel day, the final call is made to collect person and travel data over the phone.

These two techniques have various advantages and disadvantages. The self-administered mailback survey sharply reduces telephone staffing requirements, since calls are only made in the case of inconsistencies in the data. On the other hand, the telephone/mailout survey eliminates mailback costs, and may ensure more accurate information, since any discrepancies can be resolved over the phone. Telephone/mailout also is more flexible with regard to non-English-speaking households, in that the language spoken by the household can be specified at the time of the initial call.

There are also implications with regard to the sampling frame for the two techniques. For the self-administered mailback, a complete list of household addresses in the county is needed. In Chicago, a utility residential file was used as the sampling frame, and this had the additional advantage of containing only residences. Generally, however, there is an added cost involved in obtaining a residential listing of this type. The telephone/mailout survey includes all households with a telephone in its sampling frame. According to the 1990 Census, 95 percent of Dade County households have a telephone.

A toll-free telephone number can be set up in conjunction with either technique, although this is more common in telephone/mailout surveys. This number is used by respondents to report problems, to speak to the project manager in order to verify that the survey is legitimate, or to report the diary results in the event that the respondent is difficult to reach. Return of the diaries by mail is permitted if the respondent insists upon it, although return postage is generally not provided in telephone/mailout.

The travel survey is usually designed and analyzed in-house, although consultants are sometimes used. Survey administration tends to be done by a consultant.

Most travel surveys reviewed for this report ask for a one-day travel diary from all members of the household over a certain age (ranging from 5 to 14). The agency specifies the travel day. Chicago has chosen Thursday as its travel day, while most other places assign weekdays sequentially or according to when the initial call is made.

The time frame in which the survey is conducted varies from two months to five years, depending on the size of the sample. Summer months are avoided, since travel patterns during these months are atypical.

The telephone/mailout/telephone technique is recommended for the Metro-Dade travel survey. The ability to clarify inconsistencies immediately over the phone is a major advantage of this technique. The initial telephone contact can determine the need for a non-English survey diary, thus eliminating the need to make all forms bilingual. Mailback costs are eliminated in a telephone/mailout survey. If arrangements can be made for the telephone interviewer to enter the responses directly into a computer, transcribing and coding errors are also minimized. Finally, the accuracy of any address file used as a sampling frame for a self-administered mailback survey is questionable in the aftermath of Hurricane Andrew. Although telephone listings are also inaccurate, these are easier and less costly to address (i.e., calling a non-working number versus mailing to a non-existent address).

The target population should consist of all household members age 5 and over. This is more inclusive than the target population for the MDTA on-board survey (age 12+), but it matches the Nationwide Personal Transportation Study (NPTS) target population and is appropriate for the purpose of calibrating a regional travel model.

TYPES OF SURVEYS

The traditional travel survey has focused on the collection of trip information. Respondents are asked to report all of their trips for a given time period, and the number of trips (either total or by purpose) is usually the dependent variable in the analysis of travel patterns. Most of the surveys cited in the bibliography as well as the NPTS can be characterized as trip-based.

Alternatives to the trip-based approach to gathering travel information have been put forth over the past fifteen to twenty years. These have been motivated primarily by an awareness of the importance of understanding the underlying causes of travel behavior. Trips are viewed from this perspective as means to the end of carrying out various activities, and so are not accorded primary focus. This approach has been termed behavioral or activity-based, and emphasizes what people do in the course of the day. Proponents of the activity-based approach claim that it focuses on behavior and thus allows a greater responsiveness to change, because people are less likely to change their everyday activities than to change the location of these activities or the means of travel between activities.

Instead of asking where a person goes next and then the trip purpose, the activity-based surveys asks what activity is done next and then how a person gets from one activity to another. The form of the survey is different, but the resulting travel data are remarkably similar and are analyzed using the same statistical techniques.

Each approach has its proponents. The trip-based travel survey has the advantage of asking directly about the item of interest, i.e., a person's travel. An activity-based approach first asks people about their activities, which are viewed as primary and more likely to be remembered, and then about the means to reach these activities.

For the purposes of the Metropolitan Dade County travel survey, either an activity-based or trip-based approach will yield acceptable results. The proposed travel diary in Appendix A is a trip-based instrument. This should not be construed as an endorsement of the trip-based approach, but merely a reflection of the fact that this approach is still more common. Examples of activity-based travel surveys include the Los Angeles and Boston metropolitan area studies cited in the bibliography. **Metropolitan Dade County should encourage the submittal of proposals based on either a trip-based or an activity-based approach.**

SAMPLING

Sample methodologies are very similar across travel surveys. The sample unit is the household, and most surveys rely on a simple random sample, stratified by geographic area (usually the county, in multi-county metropolitan area surveys). The proposed survey will cover only Dade County, but it would be desirable to sample the northern and southern halves of the county separately, particularly in light of the effects of Hurricane Andrew in South Dade County.

In some travel surveys, the sample of households is stratified by geographic area and then by demographic characteristics. In Los Angeles, the sample was stratified by household size (5 categories), vehicle ownership (3 categories), and housing type (2 categories), yielding a 30 cell sampling matrix for each geographic area. This matrix was then modified by collapsing cells with an expected population incidence less than 10 percent of the total population within the geographic area. In the initial contact call, an interviewer on-line to the survey data base can determine by the answers to screening questions whether a household of this type is needed for the sample.

Another potential stratification scheme is by household type. The concept of life cycle might be used to stratify the sample into retired households, households with children and households without children. This sample scheme is based on the hypothesis that travel patterns differ for each group. For example, households with children may exhibit more trip chaining.

The typical sampling frame consists of all households with a telephone. To the extent that households without telephones may be characterized as low-income, the factoring of the results by income group addresses any bias introduced by not including non-telephone households.

Sample Size

Procedures for estimating appropriate sample size vary from a rule-of-thumb approach to a detailed technical analysis. In Chicago, 400 completed household surveys were desired for each geographic area, while the Metropolitan Transportation Commission in the San Francisco Bay area recommends 1,100 households per geographic area of interest. Another agency analyzed the coefficients of variation in trip rates from a previous survey, in which trip rates were stratified by variables such as housing type, household size and vehicle ownership, and determined a minimum sample size for each cell in the analysis.

The level of precision at the 95 percent confidence level can be estimated for this sample using the following formula:

$$LP = \sqrt{\frac{(z^2)(p)(q)}{n}}$$

where:

LP = Level of precision (confidence interval * 0.5)
z = z score for given confidence level (for 95% confidence level, z = 1.96)
p = proportion of population with a given characteristic (p = 0.5 in worst case)
q = 1 - p
n = total number of responses

Table 1 shows the levels of precision associated with various sample sizes for the Dade County travel survey. For the purposes of this analysis, a 25 percent response rate is assumed. The target number of completed surveys cited above for Chicago and San Francisco clearly reflect acceptable levels of precision. With 400 responses in a geographic area, the corresponding level of precision is approximately +/- 5 percent, as shown in Table 1, while 1,100 responses result in a +/- 3.0 percent level of precision.

Note that the overall level of precision in the metropolitan area will be better than the levels for each geographic sub-area. In the case of Dade County, if the number of completed surveys is 1,100 in north Dade and in South Dade, the level of precision for each sub-area would be +/- 3.0 percent. For Dade County as a whole, there would be 2,200 responses, with a resulting level of precision of +/- 2.1 percent. As another example, if the sample were stratified by geographic area (two) and demographic subgroup (three) and 400 responses were received for each of the six strata, the level of precision for each strata would be +/- 5.0 percent. For each half of the County, the level of precision would be +/- 2.8 percent (reflecting 1,200 responses in each half). A total of 2,400 responses for all of Dade County would result in a level of precision of +/- 2.0 percent.

These levels of precision apply to the sampling unit, in this case the household, and reflect the accuracy of household-related data such as vehicles owned and income. The level of precision will be better for trip-related data, since the number of trips is larger. If an average of eight trips per household is assumed with a sample size of 1,600 households and a response rate of 25 percent, the level of precision for trip-related data such as mode split and trip length is +/- 1.7 percent.

Table 1
Estimated Level of Precision at 95 Percent Confidence Level for Various Sample Sizes with a 25 Percent Response Rate

Sample Size (Number of Households Contacted)	Number of Households Responding	Level of Precision
1,600	400	.049
2,000	500	.044
4,000	1,000	.031
4,400	1,100	.030
4,800	1,200	.028
6,000	1,500	.025
8,000	2,000	.022
8,800	2,200	.021
9,600	2,400	.020

As Table 1 shows, increasing the size of the sample does not result in a proportional increase in accuracy. For example, doubling the sample size from 4,000 to 8,000 results in an improvement in level of precision from +/- 3.1 percent to +/- 2.2 percent. Because the cost of a survey is directly proportional to the number of responses, there is a diminishing return in terms of level of precision for each additional dollar spent. Also, additional sampling strata will increase the cost of the survey.

To summarize, if Dade County is stratified into a northern half and a southern half and further stratified by three household types, and survey results are obtained for 400 households in each of the six resulting strata, the resulting level of precision will be +/- 4.9 percent for household data and +/- 1.7 percent for trip data in each strata. In each of the two geographic areas of the county, the level of precision is +/- 2.8 percent for household data and +/- 1.0 percent for trip data. Finally, for Dade County as a whole, the levels of precision are +/- 2.0 percent at the household level and +/- 0.7 percent at the trip level. This accuracy should be sufficient for recalibrating the travel model.

After consultation with Metro-Dade MPO staff, **CUTR recommends a simple random sample stratified by geographic area and household type.** This would require a sample of 1,600 households in each stratum, or 9,600 total households in order to achieve a level of precision of +/- 3 percent for each strata, with an assumed response rate of 25 percent, this. In the Chicago and San Francisco travel surveys, the response rates were 24.1 percent and 27.6 percent, respectively.

The time frame for a survey of this size should be approximately three months. This estimate is based on the experience of other cities, with a minimum time frame of two months in Los Angeles. If time is an important factor in the travel survey, Metropolitan Dade County should specifically state this in the request for proposals, and evaluate responses partly on this criterion.

Sampling Technique

Various random-dial techniques, such as a four-digit random number or the "plus one" method (in which a telephone number randomly generated or selected at random from the telephone book is adjusted by adding one to its last digit) are used for all telephone exchanges within the survey area. In the event that telephone exchange boundaries do not match county boundaries, respondents will be screened to make sure that they are Dade County residents. All respondents are screened to ensure that the telephone is at a residence, not a place of business. See Appendix B for examples of screening questions.

The technique proposed here will ensure adequate sampling of all geographic sub-areas within Dade County. External trips can be addressed through screenline counts at appropriate locations. External trips may be more important than usual in this survey, given the extensive relocation which has taken place in the wake of Hurricane Andrew. If desired, screenline counts can also be taken at certain locations, e.g., surrounding the Central Business District or at the causeways connecting Miami Beach to the mainland, to be used in calibrating travel survey results. Since one purpose of this travel survey is to update the results of previous studies, screenline locations should be chosen to match those used in the previous travel surveys.

Boston has used a license plate survey to determine origins and destinations of external trips. Motor Vehicle files are used to identify the registered address of an observed vehicle, and a brief questionnaire is mailed to this address. This technique is not well suited for travel by tourists (with out-of-state or lease tags) and may not be appropriate for Metropolitan Dade County.

SURVEY AND ANALYSIS PROCEDURES

The travel survey is proposed to be carried out over a three month period. Travel days assigned to respondents will be weekdays only, and travel days will be assigned to households in a random fashion. This differs from the MDTA on-board survey, which used only Tuesdays, Wednesdays and Thursdays, but will shorten the time span required to conduct the survey. No survey activity will be conducted on holidays and on special event days. A pre-test is recommended, possibly using County employees, in order to uncover any potential problems with ambiguity, flow of the survey, or other unanticipated issues. Other metropolitan areas have used between 40 and 100 households to pre-test their questionnaires.

A procedures manual should be prepared to train the interviewers. The manual will clearly specify procedures to be followed in both normal and "exceptional" circumstances. Sufficient time and resources (at least 4 hours) must be allotted for training the telephone interviewers. Multi-lingual telephone interviewers must be available when the initial contacts are made; the initial interviewer will indicate the required language for the data collection call on a master form. Standby interviewers speaking other languages such as Creole should be available during the course of the survey, particularly during initial contacts with households.

The procedures manual should also address the issue of callbacks. Other places have set guidelines for the maximum number of calls for the initial contact and for obtaining diary results. This number typically varies between four and eight. In San Francisco, the most successful interviewers were assigned to make follow-up calls to "soft" refusals, i.e., those who initially refused but might be persuaded to take part in the survey. Protocol with regard to answering machines must also be defined. In one survey, no message was left on an answering machine until the fourth unsuccessful attempt to reach a person at that number. A message should be left on the first call, given the increasing use of answering machines to screen incoming household calls.

Bilingual or multi-lingual interviewers and callbacks are two procedures to ensure the maximum response possible for the travel survey. Publicity is also vital, immediately prior to and concurrent with the survey effort. Press releases and public service advertisements, possibly featuring endorsement of the importance of this survey by community leaders or media personnel, must be part of a marketing campaign to publicize the survey and elicit a high response.

Some form of incentive for respondents might also be considered. In Los Angeles, $1.00 was mailed with the travel diaries, and additional $2.00 was promised upon provision of complete travel information. Incentives can easily add over $10,000 to the cost of conducting the survey. In Boston, coupons redeemable for a Massachusetts lottery ticket were mailed with the travel diaries. If incentives are used, a promotional tie-in is less costly, since costs are shared with another agency.

Non-response bias is a potential issue in any survey. The combination of incentives, publicity and persistence can maximize response rates and lessen the importance of this issue, but it is important to develop a plan to measure and, if possible, counter any bias. Post-survey adjustments through different weighting schemes based on the demographic characteristics of respondents compared with those of the population as a whole can be effective, but remove the possibility that those who do not respond are systematically different from respondents. Adjustments of this type are described below in the discussion of factoring techniques.

One advantage of a telephone/mailback survey is that the initial telephone contact may allow the collection of basic demographic data, such as household size and vehicle ownership from households which refuse to participate in the travel survey. This provides one indication of whether there are differences between non-participating and participating households. In mailout/mailback surveys, a technique known as tail-end factoring is sometimes used. This technique assumes that non-responding households are most like those which respond late, and adjusts for non-response based on the demographic characteristics of the last responses received. The request for proposals should invite a discussion of techniques to address non-response bias.

Partially completed travel diaries will be accepted, depending on the extent to which they are complete. A recommendation arising from other surveys is to define an acceptable level of completion at the outset of the survey. This can be done at either the household or the person level. An example of acceptance criteria at the household level is that more than

half of all persons age 16 and over in the household must complete a diary, or all diaries from that household will be discarded. An example at the person level is that all trip origins, destinations, modes and purposes must be included, along with relevant household information such as numbers of persons and vehicles, in order for the diary to be considered complete. Note that this allows acceptance of travel diaries missing information on sensitive questions such as household income.

Firms responding to the request for proposals are expected to include a detailed schedule of the interviewers, procedures for maintaining communication with the interviewers (a vital step in early problem detection), and quality control procedures for interviewers, coders, geocoders, and data entry personnel. It has been recommended that ten percent of each interviewer's time be reserved for dealing with unanticipated problems. The concept of a single staff person responsible for all phases of quality control has also been suggested.

Supervision of all survey personnel is an important issue related to quality control. Procedures for reinstructing and dismissing employees should be clarified, possibly as part of a training manual. A bonus incentive system for interviewers and coders should also be considered.

Each trip diary should be stamped with a unique identification number. A log of telephone contacts and results should be kept by each interviewer, and a master log should be updated daily.

Geocoding of trip origin/destination data will be done at the Traffic Analysis Zone level. Responses to the request for proposals should address issues such as geocoding method (computerized versus manual, type of computerized reference file) and techniques for handling exceptions, partial addresses, and intersections located at TAZ boundaries. The need for geocoding personnel familiar with Dade County will be stressed in the selection process. Quality control procedures for geocoding will also be examined closely.

In the analysis of the survey data, it is anticipated that a relational data base made up of household, person and trip files will be created. The trips file will consist of linked trips, with data on each of the links preserved.

Geocoding, verification and data entry can be conducted parallel with the interview process. In Los Angeles, the telephone interviewers entered data directly into the computer during the interviews. Provisions for quality control (in the forms of a pre-coding check for

consistency and completeness, a post-data-entry check for accuracy, and including frequent back-up of data files or other efforts to ensure security of the data) must be specified by firms responding to the request for proposals. Automated data entry programs which reject invalid entries may assist in the quality control effort.

Factoring of survey results will be done in two phases. First, the response rate and sampling rate in each subgroup will be analyzed by relevant demographic categories. At a minimum, distribution of survey respondents by household size should be compared to population distribution. Vehicle ownership per household and household income can also be used to determine the representativeness of respondents compared to the overall population. For each demographic cell, separate factors or weights can be calculated to expand the survey results to the universe of overall population in each stratum. Respondents to the request for proposals will specify the variables to be used in factoring survey results.

DATA ITEMS IN GENERAL TRAVEL SURVEYS

All nine travel surveys from the metropolitan areas mentioned in the introduction were reviewed to assess the most commonly sought data items. Table 2 presents the results of this review. Data items have been categorized in terms of frequency as high (appearing in at least eight of the nine surveys), medium (four to seven surveys) and low (two or three surveys). Data items included on only one survey are not addressed in Table 2. Not surprisingly, basic household, person and trip data such as income, vehicle ownership, household size, age, sex, trip origin, destination, purpose, mode, and travel time are most common.

The phrasing of the questions and the available choices for answers differed in many cases from survey to survey. The vehicle ownership question was often phrased in terms of vehicles available for use on the travel day, and the breakdown by vehicle type did not always include bicycles and motorcycles in the list of choices. The number of break points on the household income question varied from six to fourteen. Respondents were sometimes asked to fill in their age, and other times their date of birth. Occupation was an open-ended question (which was then coded in-house) or a multiple choice question. In Los Angeles, where activity-based diaries were used, the trip questions referred instead to activities. Some surveys specified the time at which the respondents should begin keeping travel records (such as 3:00 a.m. or 4:00 a.m.), while others assumed a midnight start. Choices for trip purpose and trip mode varied in terms of specificity.

Table 2
Frequency of Data Items in Travel Survey

Questions pertaining to	High	Medium	Low
Households	vehicle ownership income # of persons in hh	valid drivers license type of residence # of visitors staying in hh # of persons over five yrs. of age	own/rent vehicle used # of persons under five yrs. of age
Persons	age sex	relationship to respondent employment status occupation student status	ethnicity place of work name/address/county
Trips	mode origin destination trip purpose start/end time	parking cost transit fare	public transportation disability trip frequency walking distance commute expenses paid by employer

The process of choosing data items and phrasing questions for a survey of this nature always involves a tradeoff between brevity and thoroughness. A general travel survey is a major, infrequent undertaking, and there is a natural tendency to include as many questions and choices as possible. The survey data base is invariably used for purposes other than those for which it was originally gathered. For example, existing travel data bases were re-examined after the energy crises of the 1970's, with a focus on energy use and efficiency. On the other hand, lengthy trip diaries can result in lower response rates.

CUTR has approached the task of designing the Metro-Dade general travel survey with a preference for including as many questions as are reasonable to ask, while maintaining the focus on the data requirements of the travel model. Proposed trip diaries and telephone interview scripts are included in Appendices A and B.

COST

Table 3 contains travel survey costs for six metropolitan areas. The general rule of thumb is $100 per completed survey. Average costs in Table 3 range from $43.98 to $103.73 per completed survey. The lower end of this range is for surveys where a considerable amount of work was done in-house. Some costs do not include geocoding or analysis of the results. Metropolitan Dade County should expect to spend approximately $240,000 for a complete travel survey (including geocoding and analysis), assuming 2,400 responses are received from a sample of 9,600 households.

Table 3
Travel Survey Costs for Other Cities & Regions

Year	City or Region	Length of Survey	Survey Method	Study Area Pop.	Study Area HHs.	Transit System Size	No. of Vehs.	Sample Size	No. of Surveys	Response Rate	Cost	Cost Per Survey	Notes/Comments
1990	St. Louis	11 q/travel diary	mail out/phone collection	1,946,526	823,073	44,577,653	612	6,373	1,446	22.69%	$150,000	$103.73	Hhs. recruited by phone; randomly selected by ph. #.
1990	San Francisco Bay Area	23 q/travel diary	phone interview/ mail out/phone collection	5,911,260	2,264,108	414,106,092	2,571	43,797	12,080	27.58%	$1,000,000	$82.78	Mailback option allowed. Heavily publicized (PSAs, press, radio, etc.).
1990	Chicago	12 q/travel diary	self-administered mail-back		2,792,036	690,114,433	4,735	75,549	18,190	24.08%	$800,000	$43.98	All work done in-house. Preliminary contact w/hh by mail.
1991	So. Calif. Assoc. of Govts.	14 q/travel diary	phone interview/ mail out/phone collection	12,121,000		515,446,656	3,280	30,255	16,086	53.17%	$1,499,950	$93.25	Utilized $$ incentives for responses. Diary printed in 5 languages. Geocoding not in cost.
1990	Boston	13 q/travel diary	phone interview/ mail out/phone collection	2,871,000		323,563,782	1,692	8,900	4,000	44.94%	$300,000	$75.00	Number of surveys is target, not actual. Lottery coupons used as incentive.
1990	Minneapolis /St. Paul	travel diary	mail out/phone collection	2,079,676		69,588,432	869	9,750	6,728	69.01%	$336,400	$50.00	Cost does not include $460k of in-kind services.
			Average	4,985,892	1,959,739	342,899,508	2,293	29,104	9,755	33.52%	$681,058	$69.82	

ansit System Size - Combined annual ridership of transit systems serving the survey area (all modes).
ımber of Vehicles - Combined number of vehicles operated in maximum service (all modes).
mple Size - Number of households scheduled to be interviewed.
ımber of Surveys - Number of households actually interviewed (valid responses).
›st Per Survey - Average cost for each interview conducted that resulted in a valid survey.

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APPENDIX A
Proposed Trip Diary
Metro-Dade General Travel Survey

GENERAL INSTRUCTIONS FOR FILLING OUT THE TRIP DIARIES

THANK YOU for agreeing to participate in the Metro-Dade Travel Study. We need information on how, when, where and why people who live in Dade County travel. The success of the survey and the usefulness of the results depend on how accurately you report all trips made on your assigned travel day by **all** household members age five and older. This includes visitors who are staying at your house on the travel day.

We have enclosed _____ travel cards and ask that **each** household member fill out a card with all trips made on the travel day. It is very important that each member of the household do this.

Some suggestions on filling out your cards:

1. Each person should carry the card with him or her on the travel day. It is easier to fill out during the day than to try to remember all your trips afterward.

2. Be sure to fill in your name, the travel day and the date. If you do not travel on that day, check the line at the upper right of the card.

3. If you did travel, the first item to fill in is the address where you started the travel day (the box at the top center of the card). For the purposes of this survey, 3:00 a.m. can be considered the start of the day, and for most people, the address will be their home.

4. When you go from one place to another for any reason, this is a trip. For example, if on your way home from work you stop at a supermarket and at a video store, record these as three separate trips.

5. Include all types of trips, including trips made by walking or bicycle as well as by car, bus, etc. The only exception is for exercises like jogging, where you begin and end at the same place. But, if you drive to a park to jog, this is a trip and should be indicated.

6. Any time you change the method by which you travel, this is a new trip. For example, if you drive to a park and ride lot and then board Metrorail, record these as two separate trips.

7. If you travel by public transportation and make a transfer, this is a new trip. If you take a bus to Metrorail and then use Metromover, record these as three separate trips.

8. If members of your household go someplace together (to the mall, for example), each person should record this trip on his or her own trip card.

9. Please be as specific as possible for the trip destination (an exact address, including the city; an address range (e.g., Flagler Street between NE 1 Ave and NE 2 Ave, Miami); the name of the Metrorail station; the specific store (e.g., Dillards, Dadeland Mall); the building name (Cedars Medical Center). We need this to assign a location code to each place.

10. Please be sure to include the purpose of each trip. Examples of trip purposes include work, home, shopping, medical care, change method of travel, visit friends, etc. Enter this in the WHY column.

11. Indicate your means of travel for each trip in the HOW column, e.g., bus, jitney, auto, bike.

12. Remember to write down the times when your trips start and end, and to note whether it is a.m. or p.m.

13. If you travel in a car, light truck, van or motorcycle, indicate whether you are the driver or a passenger, and note the total number of people (including yourself) in the vehicle. You do not have to fill this out for a trip taken on public transportation.

14. If you pay to park or to use transit, put the amount and the payment method in the next to last column. For example, your cost for parking might be by the hour, daily or monthly, and a transit fare might be paid with $1.25 cash or a monthly pass costing $60.

15. Put a check in the last column if a particular trip has been affected by Hurricane Andrew. Some examples of hurricane effects might be:

    - you are living in a different location because of hurricane damage to your home
    - your job or school is in a different place due to the hurricane
    - you used to drive for this trip, but now you take Metrorail instead
    - you are making a trip for day care that you did not have to make before the hurricane

    Our telephone interviewers will ask you about the way in which any affected trips have changed. Do not check the last column if you have moved or changed your travel patterns for reasons unrelated to the hurricane.

16. Remember, all replies are strictly confidential. The information your household provides will never be used on an individual basis but only as part of the overall analysis of travel patterns in Metropolitan Dade County.

As arranged in our previous conversation, we will be calling you on _____ to gather the information recorded on these trip cards. At that time, we would like to interview each member of your household. If some household members are not available or are young children, we can take the information recorded on their travel cards from another adult.

If you have questions about how to fill in your travel card or want to know more about the survey, please call our office at _ _ _ - _ _ _ _.

Again, THANK YOU for your cooperation!

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Metro-Dade Travel Survey

TRIP DIARY

ERSON:_____

AY:_____

ATE:_____

First Address or Nearest Intersection Where You Started <u>This</u> Day:

IF YOU DID NOT TRAVEL AT ALL ON THIS DAY PLEASE CHECK HERE: ____

THEN WHERE? (Address or intersection)	WHY? Work/school/ shopping/home/etc.	HOW? Car/truck/van/bus/rail/ mover/taxi/walk/etc.	Time Started (AM/PM)	Time Arrived (AM/PM)	Driver or Rider	Number in Vehicle	Parking Cost or Transit Fare (and how paid)	Trip Affected by Hurricane?
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								

te: The last entry should be your home, or where you were at 3:00 a.m. Use the back for additional trips.

APPENDIX B
Proposed Telephone Interview Scripts
Metro-Dade General Travel Survey

SCRIPT FOR INITIAL TELEPHONE CONTACT

Hello, my name is _____ and I work for Metro Dade County. The County is conducting a survey to improve transportation in South Florida, and to get more information on how Hurricane Andrew has changed travel in our area. I would like to ask you a few questions. This should take about five minutes, and your answers will remain completely confidential.

1. Is this your residence?

   1 Yes
   2 No (GO TO 1a)

   1a. I'm sorry, this study is for residences only. Thank you for your time. (Terminate)

2. Are you 18 or older?

   1 Yes
   2 No (GO TO 2a)

   2a. May I speak with someone in your household who is 18 or older?

      1 Adult available (Go to 3)
      2 Adult not home (arrange time for call back)
      3 Refused/No such person (terminate and note on list for callback later)

3. Are you a resident of Dade County?

   1 Yes
   2 No (GO TO 3a)

   3a. I'm sorry, this study only covers Dade County residents. Thank you for your time. (Terminate)

4. Including yourself, how many people live in your household?

   _____ __

5. How many of these people are under the age of 5?

_____

6. How many cars, vans, light trucks or motorcycles are owned or leased by members of your household?

_____

We would like you and all other members of your household to keep a record of all the trips you take for just one day next week. We will send you a diary for each person in your household who is 5 or older, to keep track of their activities during the particular day. Then we will call back to collect the information. When you get the diaries in the mail, please have everyone in your household, including yourself, fill them out on _____.

To send you the diaries, I need your mailing address.

What is the zip code where you receive your mail? _____

What city do you live in? _____

And may I have the address where you receive your mail. A street address would be preferable, but a post office box is fine. Include your apartment number, if you have one.

_____

Whose name should we put on the envelope?

_____

VERIFY ADDRESS
NOTE LANGUAGE FOR TRAVEL DIARIES _____ (Ask if unsure)

7. One final question. I will read a series of income ranges. Please stop me when I read the range that is closest to your household's total annual income before taxes. (CIRCLE response)

1	Less than $10,000
2	$10,000 to $15,000
3	$15,000 to $20,000
4	$20,000 to $30,000
5	$30,000 to $40,000
6	$40,000 to $50,000
7	$50,000 to $60,000
8	$60,000 to $75,000
9	$75,000 to $100,000
10	Over $100,000
98	Refused
99	Don't know

THANK YOU VERY MUCH for helping us in this study. We will call you the evening before your diary day to make sure you have received your diaries and to answer any questions you may have. If you have any questions or comments about the study, you can call (NAME OF PROJECT MANAGER), the Project Manager at Metropolitan Dade County at _ _ _ - _ _ _ _.

SCRIPT FOR DATA COLLECTION

Hello, may I speak with (Name of original contact)? I'm calling about the travel survey we are conducting. We spoke with (Name of original contact) last week about this.

Hello, my name is _____. We called you last week and asked you and your household to fill out travel diaries in order to help Dade County to improve transportation. I'd like to collect the information in the travel diaries over the phone.
Could you please get the diaries now?

If not now, ask what would be a convenient time.
If never received forms, check address and ask that they fill out next _____.

Before collecting the travel data from the diaries, I would like to collect information about each person age 5 and over in your household. For the person who filled out form _____: (repeat questions 1 through 6 for each person)

1. What is the year of birth? 19___

2. What is the relationship of this person to you?

   1 self
   2 husband/wife
   3 son/daughter
   4 father/mother
   5 brother/sister
   6 other related
   7 other non-related

3. What is this person's sex?

   1 male
   2 female

4. Does this person have a driver's license?

   1 yes
   2 no

5. What is this person's employment status?

1 employed full time
2 employed part time
3 retired (go to next person)
4 student full time (go to next person)
5 student part time (go to next person)
6 unemployed, looking for work (go to next person)
7 other

6. What is this person's occupation?

1 professional/technical
2 managerial/administrative/executive
3 secretary/clerical
4 retail sales
5 other sales
6 shop or production worker
7 craftsman or foreman
8 equipment vehicle operator
9 service worker
10 general labor
11 military
12 farming/forestry/fishing
13 other

GO TO NEXT PERSON

WHEN FINISHED WITH ALL PERSONS, ASK QUESTION 7 FOR HOUSEHOLDS WITH P.O. BOX ADDRESS

7. One final question about your household. I need to collect your street address. When we called last week you provided us with a post office box number. We need your street address so that we can locate your household in a traffic analysis zone. This information is strictly confidential, will not be given out to anyone, and will not be used to mail you literature. It is very important for the purposes of our survey.

Street address: _____

City/Zip Code: _____

Now, for the person who filled out travel diary number _____:

COLLECT DATA ON BLANK FORM.
PROBE FOR ANY TRIP WITH HURRICANE EFFECT NOTED. ASK:

How was this trip affected by Hurricane Andrew?

1. It starts at a different place
2. It ends at a different place
3. I use a different mode of travel to make this trip
4. I did not previously make this trip
5. Other (note in margin)

AFTER ALL DATA FOR THE PERSON'S TRIPS ARE COLLECTED, ASK:

Were you/was this person residence or job affected by Hurricane Andrew?

1. yes (ask next question)
2. no (skip next question)

How were you/this person affected?

1. Moved to a different location
2. Job is now in a different location
3. Lost my job; still unemployed
4. Lost my job; now work for someone else
5. Got a new job in cleanup efforts
6. Other (note in margin)

GO BACK TO QUESTION 1 FOR THE NEXT DIARY

WHEN ALL DIARIES ARE DONE:

I want to thank you very much on behalf of all of us participating in this survey. Your responses will not be analyzed individually, but will help us understand and plar for current travel patterns in Metropolitan Dade County. Again, thank you for your time and help.