U.S. Department of Transportation

U.S. Environmental Protection Agency

Travel Survey Manual

Appendices

TMIP

Travel Model Improvement Program

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Travel Survey Manual - Appendices

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Prepared by

Cambridge Systematics, Inc.

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Appendix A

The Costs of Travel Surveys

The Costs of Travel Surveys

Travel surveyors are almost always constrained by limited available resources. More often than not, the survey design and sampling tasks are bounded by funding limits, so the survey team needs to be able to estimate the cost of various types of surveys early in their effort.

Estimating Costs Based on Previous Survey Efforts

The most common source of rough cost estimates is the reported costs of previous efforts. The costs of travel survey efforts are often reported in technical papers and reports. In addition, rules-of-thumb about survey costs are commonly cited. For instance, many surveyors use a figure of $100 per completed survey for telephone-mail-telephone household travel surveys.

Unfortunately, there are several problems with relying on past survey experience in estimating costs:

- The analyses rarely account for inflation;
- The analyses do not account for deteriorating cooperation rates over time;
- The analyses do not account for geographic differences;
- It is often difficult to determine which survey cost elements are included in the past cost estimates; and
- It is highly unlikely that the past efforts will include the same survey design elements and sampling considerations as the survey team's proposed effort.

To analyze the cost of a past survey effort, the survey team needs to account for inflation. If the year of the past survey is known, then this is a fairly trivial calculation. However, this step is commonly ignored. This is particularly true with rules-of-thumb. It is impossible to know whether these estimates have been developed in the recent past or whether they have considered the effects of inflation.

Even if past costs are adjusted for inflation, the cost estimates will not take into account the increased difficulty of getting respondents to cooperate with survey efforts. Cooperation rates and response rates are dropping

over time for all types of surveys, and the increased difficulty of completing surveys has a direct effect on survey cost. For instance, consider this extreme example. A 1964 home interview survey had an estimated cost per completed interview of $12. If that cost is adjusted for inflation, the estimated cost per completed interview would be about $50. In reality, the 1995 cost for a home interview survey similar to that conducted in 1964 would be much higher (almost certainly more than double) than $50 per completed survey. Response rates for these types of surveys have diminished drastically over the years to the point that these types of surveys are not generally considered to be feasible.

The survey team must also be careful in using cost estimates from other locations. The availability and cost of survey worker labor differs from city-to-city. Many cities have large pools of temporary workers and University students that can be tapped for fieldwork and office jobs. Others do not. In addition, the cost of facilities and equipment are likely to be different from city-to-city. Finally, some survey locations have special characteristics that will affect the cost of the survey work. For instance, in estimating the cost of a roadside handout survey to be conducted at a barrier toll facility, the survey team should not use past survey examples in which toll collectors were asked to distribute questionnaires unless the new survey effort will also be using the toll collectors. Some toll roads will require survey teams to supply fieldworkers at the toll booths, while others will prevail upon the collectors for survey distribution.

The response rates and cooperation rates from different locations are also likely to be quite different, which means that the amount of survey worker labor may be significantly different in different locations. For instance, completing 1,000 30-minute telephone interviews with a 50 percent response rate is likely to cost $10,000 to $20,000 less than completing 1,000 30-minute interviews with a 33 percent response rate.

The final two potential problems with using past survey efforts as a guide in estimating survey costs are related to the way that survey costs are commonly reported. In order to use a past survey cost estimate effectively, the survey team must understand exactly which survey elements the estimate included. Most reported estimates are the cost to the agency of one or more survey contractors. These costs are a problem, because:

- They do not include the considerable time and effort expended on the survey by agency staff;
- Contractors are responsible for different survey elements in different survey efforts;
- They do not reflect the actual cost of the survey to the contractor, only the contract price.

Therefore, when a survey team sees a cost estimate for a past survey effort, they should seek as much detail as possible about what it includes and how it was calculated. In general, the best cost estimates for a survey effort are the costs of very recent surveys conducted in the same geographic location. Non-transportation surveys with these characteristics are probably better measures than older transportation surveys or transportation surveys performed in different places. If possible, the survey team should enlist the assistance of a local marketing research expert to obtain a better understanding of current local survey costs.

Developing Cost Estimates from Unit Costs

In addition to (or instead of) relying on past survey efforts at the beginning of a survey design effort, the survey team should try to develop cost estimates by considering each survey element. Fairly accurate estimates of likely costs can be developed with a little effort. Using simple spreadsheet software will allow the survey team to test different assumptions about response rates, labor and equipment costs, and different survey designs.

For each type of travel survey, there are fixed and variable costs. The labor costs for interviewers and fieldworkers are almost always the most important cost elements for telephone and personal intercept surveys (either interviews or questionnaire distribution). The primary expenses for mail surveys are usually postage and printing.

Table A.1 summarizes the cost components of travel surveys. The specific costs for a survey effort need to be developed based on the potential survey design(s) and on the survey team's specific plans.

The following discussion describes an example of how a survey team might estimate survey costs based on unit cost assumptions.

A survey team needs to perform vehicle intercept surveys at five locations on the perimeter of a study area. Each location needs to be surveyed in one direction, and they all average about 8,000 vehicles per day in that direction. Because of past logistical difficulties with working with DMV data files, the survey team does not wish to consider a license plate survey. However they would like to compare the costs and benefits of conducting a roadside handout survey and a roadside interview survey.

The survey team has identified a number of individuals that would be suitable for the fieldwork, so the team would like the crew to intercept platoons of five vehicles at a time, ask drivers a single screening question, and then either hand them a mailback form to complete or conduct a short interview. The survey team believes that the following efficiency levels will be achieved by the two methods:

Table A.1 Cost Components of Travel Surveys

Cost Element	Cost Basis	Rate	Notes
Assembly of Background Data, Survey Design, and Organization	Number of hours of survey team, senior, junior, and administrative staff on these tasks	Hourly labor, equipment and materials rates	Number of staff hours is dependent on survey complexity and for some surveys number of survey sites. Costs are fixed in terms of sample size.
Training Labor and Materials	Number of survey workers; number of hours of training needed per worker; number of trainers	Hourly labor, equipment and materials rates	Number of hours needed per worker is dependent on experience level of workers. Number of workers is dependent on survey schedule and worker availability. Costs are fixed in terms of sample size (except to the extent that the number of workers is related to it).
Pretesting and Data Collection Labor	Number of hours of interviewers, fieldworkers, and office workers	Hourly labor rates	Number of hours are related to the sample size and hourly productivity rates of interviewers and fieldworkers, which, in turn, are related to the expected response rate and the length of the interview or survey distribution time (or survey processing time for mail surveys).
Data Collection Equipment (including facilities, fieldworker kits, telephone and CATI equipment, computers, signage, traffic counters, etc.)	Number of survey hours (or days), number of survey workers, and/or number of survey sites	Equipment rental or depreciation rates	Number of hours are related to the sample size and hourly productivity rates of interviewers and fieldworkers, which, in turn, are related to the expected response rate and the length of the interview or survey distribution time (or survey processing time for mail surveys).

Table A.1 Cost Components of Travel Surveys (continued)

Cost Element	Cost Basis	Rate	Notes
Fieldworker Travel and Per Diem	Number of survey workers, number of survey sites, and distance to the sites	Per mile travel rate, per diem	Number of workers is dependent on survey schedule and worker availability. Costs are fixed in terms of sample size (except to the extent that the number of workers and number of sites are related to its).
Printing and Postage	Number of forms printed and mailed	Printing cost per form, postal rate	Number of forms is related to sample size and expected response rate.
Coding, Data Entry, and Editing Labor and Equipment	Number of completed forms or interviews	Cost per completed survey	Costs are usually estimated on a per form basis, but are actually related to survey team labor rates and equipment depreciation rates and productivity. The number of completed forms is related to the sample size.
Programming and Analysis Labor and Equipment	Number of hours of survey team senior, junior, and administrative staff on these tasks; number of hours of computer time	Hourly labor rates; computer depreciation rates	Number of staff hours and computer time is dependent on survey complexity. Costs are close to fixed in terms of sample size.
Other Material Costs (incentives, publicity materials, documentation)	Varies	Usually fixed charges; or cost per survey	Costs for most materials are fixed in terms of sample size. Incentive cost is related to sample size and response rate.

	Handout/ Mailback	Interview
Average platoon assembly time (min.)	2	2
Average data collection time (min.)	1	5
Average platoon release time (min.)	1	3
Time between platoons (min.)	2	2
Total platoon cycle time (min.)	6	12
Platoons per hour	10	5
Vehicles per hour	50	25
Vehicles per day (12 hours)	600	300

Both survey methods will require automatic counting equipment, signage, and safety equipment. The anticipated site design for the handout survey will require the daily rental of $600 of equipment per survey site. The interview survey will require $800 of equipment per survey site.

Based on past experiences, the survey team expects the following response from the two survey methods:

	Handout/ Mailback	Interview
Cooperation rate (respondent agrees to interview or accepts questionnaire)	95%	85%
Completion rate (respondent completes survey)	25	95
Percent of completed surveys that are usable	90	95
Percent of contacts yielding usable survey data	21	77

Tables A.2 and A.3 show the cost estimation calculations. In this case, the roadside interview survey is the more cost effective method. However, the survey team needs to weigh the reduced cost against the added traffic disruption of the method.

Table A.2 Assumptions Used in Survey Costing Example

	Handout/Mailback Survey		Interview Survey	
	First Site	Each Other Site	First Site	Each Other Site
Survey Design and Analysis				
Senior Analyst hours	60	0	60	0
Junior Analyst hours	80	0	80	0
Administrative hours	120	0	120	0
Training				
Number of Supervisors	1	0	1	0
Number of Technicians	8	0	8	0
Training Hours	3	0	3	0
Survey Station Setup Period				
Number of Supervisors	1	1	1	1
Number of Technicians	2	2	2	2
Number of Police Officers	1	1	1	1
Setup Hours	1	1	1	1
Data Collection Period				
Supervisors	1	1	1	1
Interviewers (number of vehicles in platoon)	5	5	5	5
Flaggers	1	1	1	1
Counters	1	1	1	1
Police Officers	1	1	1	1
Spare technicians	1	1	1	1
Data collection hours	12	12	12	12
Site Equipment				
Signage/Safety Equipment	$400	$400	$600	$600
Automated traffic recorders	200	200	200	200
Total Equipment	$600	$600	$800	$800
Travel and Per Diem				
Fieldworkers	9	9	9	9
Average Cost per Fieldworker	$ 25	$ 25	$ 25	$ 25
Cost	$225	$225	$225	$225
Station Efficiency				
Average platoon assembly time (min)	2	2	2	2
Average data collection time (min)	1	1	5	5
Average platoon release time (min)	1	1	3	3

Table A.2 Assumptions Used in Survey Costing Example (continued)

	Handout/Mailback Survey		Interview Survey	
	First Site	Each Other Site	First Site	Each Other Site
Station Efficiency (continued)				
Average clearing time (min)	2	2	2	2
Platoon cycle time (min)	6	6	12	12
Platoons per hour	10	10	5	5
Vehicles through station per hour	50	50	25	25
Vehicles through station per day	600	600	300	300
Labor Rate Assumptions				
Senior Analyst rate per hour	$40	$40	$40	$40
Junior Analyst rate per hour	20	20	20	20
Administrative rate per hour	10	10	10	10
Supervisor rate per hour	11	11	11	11
Technician rate per hour (includes interviewers, flaggers, counters)	8	8	8	8
Police Officer rate per hour	$24	$24	$24	$24
Survey Return Rates				
Cooperation Rate	95%	95%	85%	85%
Forms distributed	570	570	255	255
Completion Rate	25%	25%	95%	95%
Forms returned	142	142	242	242
Percent of returns that are usable	90%	90%	95%	95%
Completed forms	127	127	229	229
Printing and Postage				
Survey Instruments needed	570	570	255	255
Printing cost per instrument	$ 0.15	$ 0.15	$0.02	$0.02
Printing cost	$85.50	$85.50	$5.10	$5.10
Surveys returned	142	142	242	242
Postage per survey	$ 0.20	$ 0.20	$0.00	$0.00
Postage cost	$28.40	$28.40	$0.00	$0.00
Coding, Entering, Editing				
Completed forms	127	127	229	229
Cost per form	$ 0.80	$ 0.80	$ 0.80	$ 0.80
Coding, Entering, Editing cost	$101.60	$101.60	$183.20	$183.20

Table A.3 Cost Summary for Survey Costing Example

	Handout/Mailback Survey			Interview Survey		
	First Site	Each Other Site	Total for 5 Sites	First Site	Each Other Site	Total for 5 Sites
Labor						
Senior Analyst	$2,400.00	$ 0.00	$ 2,400.00	$2,400.00	$ 0.00	$ 2,400.00
Junior Analyst	1,600.00	0.00	1,600.00	1,600.00	0.00	1,600.00
Administrative	1,200.00	0.00	1,200.00	1,200.00	0.00	1,200.00
Supervisors	176.00	143.00	748.00	176.00	143.00	748.00
Technicians	976.00	784.00	4,112.00	976.00	784.00	4,112.00
Police Officers	312.00	312.00	1,560.00	312.00	312.00	1,560.00
Total	$6,664.00	$1,239.00	$11,620.00	$6,664.00	$1,239.00	$11,620.00
Direct Costs						
Site Equipment	$ 600.00	$ 600.00	$3,000.00	$ 800.00	$ 800.00	$4,000.00
Travel and Per diem	225.00	225.00	1,125.00	225.00	225.00	1,125.00
Printing	86.00	86.00	428.00	5.00	5.00	26.00
Postage	28.00	28.00	142.00	0.00	0.00	0.00
"Coding, Entering, Editing"	102.00	102.00	508.00	183.00	183.00	916.00
Total	$1,041.00	$1,041.00	$5,203.00	$1,213.00	$1,213.00	$6,067.00
Site Total	$7,705.00	$2,280.00	$16,823.00	$7,877.00	$2,452.00	$17,687.00
Completed forms	127	127	635	229	229	1145
Cost per completed	$ 60.67	$ 17.95	$ 26.49	$ 34.40	$ 10.71	$ 15.45

Appendix B

Census Data for Travel Surveys

Census Data for Travel Surveys

The data items shown in Table B.1 were collected in the 1990 Census from questions asked of everyone or every housing unit (using the so-called "short-form"). The data items shown in Table B.2 were collected from a sample of roughly 1/6 of the housing units (using the "long-form").

The Census Bureau has processed and tabulated the 1990 data and makes the information available in a number of electronic data files and printed reports. In general, the electronic files provide greater subject matter detail with more geographic specificity than the printed reports, so the electronic files tend to be more helpful for planning household travel/activity surveys. There are four types of computer files:

- Summary Tape Files (STFs);
- Subject Summary Tape Files (SSTFs);
- Public Use Microdata Sample (PUMS) Files; and
- Other special computer tape files.

Summary Tape Files are the most commonly used files for designing household surveys. They present population and housing data aggregated to various geographic levels. The different STFs are summarized in Table B.3.

Subject Summary Tape Files are used to develop special Census reports. They provide greater detail than the STFs on about 20 different topic areas. These files tend to be less helpful than the STFs in planning household travel/activity surveys because the particular subject areas are not directly relevant to transportation planning and because the data are not available at the detailed geographic levels that the STFs are.

The Public Use Microdata Sample files contain actual housing-unit records for samples of long-form households. In order to protect peoples' privacy, the records are stripped of all information that could be used to identify particular households, and the data are combined into large geographic areas. The PUMS data are available in two forms:

- A five percent sample of housing units grouped into areas with populations of at least 100,000 people; and
- A one percent sample of housing units grouped into metropolitan areas (and other large areas outside of metropolitan areas).

Table B.1 1990 100-Percent Census Data

Population	Housing
Household relationship	Number of units in structure
Sex	Number of rooms in unit
Race	Tenure – owned or rented
Age	Value of home or monthly rent
Marital status	Congregate housing (meals included in rent)
Hispanic origin	Vacancy characteristics

Source: U.S. Census Data Products Documentation.

Table B.2 1990 Sample Census Data

Population	Housing	Economic Characteristics
Social Characteristics	Year moved into residence	Labor force
Education – enrollment and Place of birth, citizenship, and year of entry into U.S.	Number of bedrooms Plumbing and kitchen facilities Telephone in unit	Occupation, industry, and class of worker
Ancestry	Vehicles available	Place of work and journey to work
Language spoken at home	Heating fuel	Work experience in 1989
Migration (residence in 1985)	Source of water and method of sewage disposal	Income in 1989
Disability	Year structure built	Year last worked
Fertility	Condominium status	
Veteran status	Farm residence	
	Shelter costs, including utilities	

Source: U.S. Census Data Products Documentation.

Table B.3 1990 Census Summary Tape Files (STFs)

STF Series	Data Items	STF File	Geographic Specificity
1	100 percent population and housing counts and characteristics for each geographic area.	1A	States, counties, county subdivisions, places, Census tracts/BNAs, block groups, Alaska Native Areas, state parts of American Indian areas.
		1B	States, counties, county subdivisions, places, Census tracts/BNAs, block groups, blocks, Alaska Native Areas, state parts of American Indian areas.
		1C	U.S., regions, divisions, states (including summaries such as urban and rural), counties, places and county subdivisions with 10,000 or more people for some states, metropolitan areas, urbanized areas, Alaska Native Areas, and American Indian areas.
		1D	Congressional districts of the 103rd Congress by State, and within each district: counties, places and county subdivisions with 10,000 or more people for some states, Alaska Native Areas, and American Indian areas.
2	100 percent population and housing counts and characteristics for each geographic area tabulated for the total population and by race and Hispanic origin.	2A	Metropolitan areas, and within each area: places of 10,000 or more people and census tracts/BNAs. Non-metropolitan areas, and within these areas: counties, places of 10,000 or more people, and census tracts/BNAs.

Table B.3 1990 Census Summary Tape Files (STFs) (continued)

STF Series	Data Items	STF File	Geographic Specificity
		2B	States (including summaries such as urban and rural), counties, places of 1,000 or more people, county subdivisions, Alaska Native Areas, and state parts of American Indian areas.
		2C	U.S., regions, divisions, states (including summaries such as urban and rural), counties, places and county subdivisions with 10,000 or more people for some states, all county subdivisions in New England metropolitan areas, metropolitan areas, urbanized areas, Alaska Native Areas, and American Indian areas.
3	Long-form sample population and housing characteristics for each geographic area.	3A	States, counties, county subdivisions, places, Census tracts/BNAs, block groups, Alaska Native Areas, state parts of American Indian areas.
		3B	Five-digit ZIP codes within each state.
		3C	U.S., regions, divisions, states, counties, places and county subdivisions with 10,000 or more people for some states, metropolitan areas, urbanized areas, Alaska Native Areas, and American Indian areas.
		3D	Congressional districts of the 103rd Congress by State, and within each district: counties, places and county subdivisions with 10,000 or more people for some states.

Table B.3 1990 Census Summary Tape Files (STFs) (continued)

STF Series	Data Items	STF File	Geographic Specificity
4	Long-form sample population and housing characteristics for each geographic area tabulated for the total population and by race and Hispanic origin.	4A	Metropolitan areas, and within each area: places of 10,000 or more people and census tracts/BNAs. Non-metropolitan areas, and within these areas: counties, places of 10,000 or more people, and census tracts/BNAs.
		4B	States (including summaries such as urban and rural), counties, places of 1,000 or more people, county subdivisions, Alaska Native Areas, and state parts of American Indian areas.
		4C	U.S., regions, divisions, states (including summaries such as urban and rural), counties, places and county subdivisions with 10,000 or more people for some states, all county subdivisions in New England metropolitan areas, metropolitan areas, urbanized areas, Alaska Native Areas, and American Indian areas.

Source: U.S. Census Data Products Documentation.

The PUMS files enable survey designers to prepare customized cross-tabulations of all non-geographic items on the Census long form. This can be extremely helpful in the development of sampling strata and in the validation of survey data.

The Census Bureau also compiles a number of specialized computer files for specific audiences. The most important file for transportation planning and household travel/activity survey development purposes is the Census Transportation Planning Package (CTPP). This file contains cross-tabulations commonly used in measuring trip generation and detailed data on people's journeys to work. The CTPP is a common data source for most transportation planning agencies.

The CTPP data are distributed by the Bureau of Transportation Statistics and are available on CD-ROM. The CTPP files were developed from the census long-form responses, and are particularly helpful in providing detailed cross-tabulated data on work trips out of and into particular geographic areas, as well as providing information on the characteristics of trips between areas. The data tabulated in these files includes detailed information by place of residence, place of work, and place of residence by place of work (work trip) data.

Among the most important cross-tabulations available from the CTPP data files are:

- Household size by workers in household;
- Household income by workers in household;
- Household size by vehicles available;
- Workers in household by vehicles available;
- Household income by vehicles available;
- Means of transportation to work by workers, household income, and vehicles available;
- Means of transportation to work by travel time; and
- Time of departure to work and arrival at work by means of transportation and/or travel time.

The geographic specificity of these data was initially broad when they were released in 1993, but the data have increasingly been segmented to smaller geographic divisions on subsequent Census releases. Detailed tables are now available at the census tract and Traffic Analysis Zone (TAZ) levels for urban areas, and at the census tract level for the remaining areas of the state. Table B.4 shows the different parts of the CTPP data

Table B.4 1990 CTPP Data Files

Part	Tabulated by	Geographic Specificity
Statewide Element (51 states)		
Part A	Area of Residence	Counties and Places of 2,500 or more population
Part B	Area of Work	Counties and Places of 2,500 or more population
Part C	Area of Residence by Area of Work	Counties and Places of 2,500 or more population
Part D	Area of Residence	Counties and Places of 75,000 or more population
Part E	Area of Work	Counties and Places of 75,000 or more population
Part F	Area of Residence by Area of Work	Counties and Places of 75,000 or more population
Urban Element (300 packages)		
Part 1	Area of Residence	TAZ/Tracts
Part 2	Area of Work	TAZ/Tracts
Part 3	Area of Residence by Area of Work	TAZ/Tracts
Part 4	Area of Residence	Aggregate Urban Geography
Part 6	Area of Residence by Area of Work	Super-districts in Areas Over 1,000,000
Part 7	Area of Work	Census Tracts
Part 8	Area of Residence by Area of Work	TAZ/Tracts in Areas Over 1,000,000

Source: Census Transportation Planning Package Documentation.

catalog with the corresponding information type and geographic specificity.

The Census Bureau provides detailed documentation on all data files and provides several avenues for receiving assistance. Table B.5 lists a number of Census Bureau resources available to planners of household travel/activity surveys.

Table B.5 Census Bureau Resources for Planners of Household Travel/Activity Surveys

Census Publications

1990 Census of Population and Housing, Guide. This guide provides detailed information about all aspects of the census and a comprehensive glossary of census terms. Sold by the Superintendent of Documents, U.S. Government Printing Office.

Census Catalog and Guide. A comprehensive annual description of data products, statistical programs, and services of the Census Bureau. It provides abstracts of the publications, data files, microfiche, maps, and items on-line. In addition, the Catalog/Guide offers such features as information about censuses and surveys and telephone contact lists of data specialists at the Census Bureau, the State Data Centers, and other data processing service centers. It is sold by the Superintendent of Documents, U.S. Government Printing Office.

Census '90 Basics. A free booklet covering how the 1990 census data were collected and processed, the full range of data products, the maps and geographic files, and more, but with less detail than the Guide (above). Request from Customer Services.

Census ABC's – Applications in Business and Community. A free booklet that highlights key information about the 1990 census and illustrates a variety of ways the data can be used. Request from Customer Services.

Census and You. The Census Bureau's monthly newsletter for data users. It reports on the latest 1990 census developments, selected new publications and computer tape files, other censuses and surveys, developments in services to users, and upcoming conferences and training courses. Subscriptions are sold by the Superintendent of Documents, U.S. Government Printing Office.

Monthly Product Announcement. A free monthly listing of all new Census Bureau publications; microfiche; maps; data files on tape, diskettes, or CD-ROM; and technical documentation. To subscribe, contact Customer Services.

Table B.5 Census Bureau Resources for Planners of Household Travel/Activity Surveys (continued)

Census Contacts

U.S. Bureau of the Census Customer Services – sells most of the machine-readable data products, microfiche, and maps. Also, users may consult with specialists at the Census Bureau's Washington headquarters. From time to time, the specialists also conduct workshops, seminars, and training courses. Customer Services, U.S. Bureau of the Census, Washington, DC 20233, telephone: (301) 457-4100 (FAX number: (301) 457-4714).

Superintendent of Documents, U.S. Government Printing Office – handles the sale of most of the Federal Government's publications, including 1990 census reports. To order reports and for information: Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402, telephone: (202)-783-3238.

Census Regional Offices – Users may consult with regional experts, at the following offices:

Atlanta, GA	(404) 730-3833	Boston, MA	(617) 424-0510
Charlotte, NC	(704) 344-6144	Chicago, IL	(708) 562-1740
Dallas, TX	(214) 767-7105	Denver, CO	(303) 969-7750
Detroit, MI	(313) 259-1875	Kansas City, KS	(913) 551-6711
Los Angeles, CA	(818) 904-6339	New York, NY	(212) 264-4730
Philadelphia, PA	(215) 597-8313	Seattle, WA	(206) 728-5314

State Data Centers – The Census Bureau furnishes data products, training in data access and use, technical assistance, and consultation to States. State Data Centers, in turn, offer publications for reference, printouts from computer tape, specially prepared reports, maps, and other products and assistance to data users.

National Clearinghouse – a listing of private companies and other organizations that offer assistance in obtaining and using data released by the Census Bureau.

Depository Libraries – There are more than 1,500 libraries that receive Census Bureau reports.

Source: U.S. Bureau of the Census, Telephone Contacts for Data Users, January 1995.

Appendix C

An Example of the Capabilities of CATI Systems

An Example of the Capabilities of CATI Systems

Figure 6.B.1 shows an excerpt of a recent household travel survey that illustrates the advantages of using a computer-assisted interviewing approach. The survey from which this is taken was a telephone survey of residents of a small area of northern Manhattan and the Bronx. One of the objectives of the survey was to measure how subway users' perceptions of the subway lines that they use differ from the perceptions of subway non-users. By the time the point of the survey shown has been reached, the CATI system has assigned each respondent to a particular group (using a variable called GROUP) based on his or her usage of subway services.

The CATI system presents the interviewer with question d1, which asks the respondent to rate the overall subway system from one to 10. The CATI system waits for the interviewer to enter a number from one through 10, or to enter 99. If the interviewer were to try to enter a number outside of the acceptable range, the CATI system would beep and request that the interviewer re-enter the number.

Once an acceptable reply is entered for question d1, the CATI system would present the appropriate transition text to the interviewer based on the stored value of the variable GROUP for the respondent. So, for a respondent assigned to Group 1 the computer screen would read:

> *"I now want to ask your opinions about the service offered by specific subway lines. I'll be asking about the "D" train, that's the 6th Avenue Express. Please answer in terms of your recent travel on the "D" train to go south towards midtown or downtown.*
>
> *If you don't use the particular line much, you could base your answers on what you may have heard from others. When I ask you about each aspect of service, please rate the service by giving me a number between zero and ten, where ten is the best possible score and zero is the worst score. You can choose 10, zero, or any number in-between.*
>
> *What number best expresses how you would rate the overall service on the "D" train?"*

The computer screen for a respondent assigned to Group 3 would be slightly different:

Figure C.1 An Example of CATI Capabilities

NYCTA COMPREHENSIVE LINE IMPROVEMENT STUDY
TELEPHONE SURVEY
TABULATION VERSION

November 20, 1992

D1. **Ask all:**
We'd like to get your overall opinion of the New York City Subway System. Please rate the subway system overall by giving me a number between zero and 10, where 10 is the best possible score and zero is the worst possible score. You can choose 10, zero, or any number in between that best describes your opinion. How do you rate the subway system overall?

Overall Rating	__
Don't Know	99
Refused	99

I now want to ask your opinions about the service offered by specific subway lines. I'll be asking

GROUP = 1, 4, or 7: about the "D" train, that's the 6th Avenue Express. Please answer in terms of your recent travel on the "D" train to go south towards midtown or downtown.

GROUP = 2, 3, or 6: about the "A" train, that's the 8th Avenue Express. Please answer in terms of your recent travel on the "A" train to go south towards midtown or downtown.

GROUP = 5: about both the "A" train and the "1" and "9" train. The "A" train is the 8th Avenue Express, and the "1" and "9" trains are the Broadway/7th Avenue IRT trains. Please answer in terms of your recent experience on these lines to go south towards midtown or downtown.

Ask all:
If you don't use the particular line much, you could base your answers on what you may have heard from others. When I ask you about each aspect of service, please rate the service by giving me a number between zero and 10, where 10 is the best possible score and zero is the worst score. You can choose 10, zero or any number in between.

GROUP = 1, 4, or 7: What number best expresses how you rate the *overall service* on the "D" train?

GROUP = 1, 4, or 7	"D"
Enter Rating Score:	___
Don't Know	98
Refused	99

GROUP = 2, 3, 5, or 6: What number best expresses how you rate the *overall service* on the "A" train?

GROUP = 2, 3, 5, or 6	"A"
Enter Rating Score:	___
Don't Know	98
Refused	99

Figure C.1 An Example of CATI Capabilities (continued)

NYCTA COMPREHENSIVE LINE IMPROVEMENT STUDY
TELEPHONE SURVEY **November 20, 1992**
TABULATION VERSION

GROUP = 5: And how would you rate the *overall service* on the "1" or "9" train?

GROUP = 5	"A"
Enter Rating Score:	___
Don't Know	98
Refused	99

User groups (GROUP = 1 –5)

Repeat the next block of questions, randomizing the order of aspects asked in Q.D2-D-18. For GROUP = 5, ask about each attribute for the "A" and the "1/9" before moving on to the next attribute. Accept don't knows without question.

GROUP = 1 or 4: Next, please think about **[aspect]**. How do you rate that for the "D" line?

GROUP = 2, 3, or 5: Next, please think about **[aspect]**. How do you rate that for the "A" line?

GROUP = 5: And how does the "1"/"9" line rate?

D2. Being able to count on a train coming within the time you expect?
D3. The level of crowding on the train during rush hours (that's on weekdays between 6:00 and 10:00 in the morning and between 3:00 and 7:00 in the evening)? (Remember 10 is the best possible condition and zero is the worst possible.)
D4. The level of crowding on the trains during non-rush hours (that's on weekends, on weekdays between 10:00 in the morning and 3:00 in the afternoon, and after 7:00 at night)? (Remember 10 is the best possible condition and zero is the worst possible.)
D5. How safe from crime you feel riding on the subway train on weekdays between 6:00 and 10:00 in the morning and between 3:00 and 7:00 in the evening?
D6. How safe from crime you feel riding on the subway train on weekdays between 10:00 in the morning and 3:00 in the afternoon?
D7. How safe from crime you feel riding on the subway train after 7:00 PM on weeknights?
D8. How safe from crime you feel riding on the subway train on weekends during the day?
D9. How safe from crime you feel riding on the subway train on weekends after 7:00 PM?
D10. The condition and state of repair of stations on the line?
D11. The condition and state of repair of subway cars on the line?
D13. General cleanliness in stations?
D14. General cleanliness on trains?
D15. The helpfulness of announcements made in stations?
D16. The helpfulness of announcements made on trains?
D17. The helpfulness of signs and maps in the stations?
D18. The helpfulness of signs and maps on trains?

Figure C.1 An Example of CATI Capabilities (continued)

NYCTA COMPREHENSIVE LINE IMPROVEMENT STUDY
TELEPHONE SURVEY **November 20, 1992**
TABULATION VERSION

D19. The speed of your trip once you get on the train? (Remember we want your zero to 10 rating, not the amount of time it takes you.)
D20. The number of unexpected delays? (Remember 10 is the best possible condition and zero is the worst possible.)
D20a. The amount of time lost because of unexpected delays?
D21. How long you have to wait for a train during the morning rush hours? (Remember we want your zero to 10 rating, not the amount of time you have to wait.)
D22. How long you have to wait for a train during the afternoon rush hours?
D23. How long you have to wait for a train in the evenings, after rush hour is over?
D24. How long you have to wait for a train during the middle of a weekday?
D25. How long you have to wait for a train on the weekend, during the day?
D26. How long you have to wait for a train on the weekend, at night?

Potential User Groups (GROUP = 6 or 7):

Repeat the next block of question, randomizing the order of aspects asked in Q.D2-D18. Accept don't knows without question.

GROUP = 7: Next please think about **[aspect]**. How do you rate that for the "D" line?

GROUP = 6: Next, please think about **[aspect]**. How do you rate that for the "A" line?

D2. Being able to count on a train coming within the time you expect?
D6. How safe from crime you feel riding on the subway train on weekdays during the day?
D7. How safe from crime you feel riding on the subway train after 7:00 PM on weeknights?
D8. How safe from crime you feel riding on the subway train on weekends during the day?
D9. How safe from crime you feel riding on the subway train on weekends after 7:00 PM?
D10. The condition and state of repair of stations on the line?
D11. The condition and state of repair of subway cars on the line?
D13. General cleanliness in stations?
D14. General cleanliness on trains?
D20. The number of unexpected delays? (Remember 10 is the best possible condition and zero is the worst possible.)
D20a. The amount of time lost because of unexpected delays?
D21. How long you have to wait for a train during the morning rush hours? (Remember we want your zero to 10 rating, not the amount of time you have to wait.)
D23. How long you have to wait for a train in the evenings, after rush hour is over?

"I now want to ask your opinions about the service offered by specific subway lines. I'll be asking about the "A" train, that's the 8th Avenue Express. Please answer in terms of your recent travel on the "A" train to go south towards midtown or downtown.

If you don't use the particular line much, you could base your answers on what you may have heard from others. When I ask you about each aspect of service, please rate the service by giving me a number between zero and ten, where ten is the best possible score and zero is the worst score. You can choose ten, zero, or any number in-between.

What number best expresses how you would rate the overall service on the "A" train?"

The interviewer needs only to read what he or she is prompted to read by the CATI system. The interviewer does not need to remember which group a particular respondent is assigned to or the appropriate questions for the different groups. This feature of CATI cuts down the possibility that a respondent is asked about the wrong subway lines.

Once the interviewer enters the respondent's rating (and the CATI system once again ensures that the entered value is in the range of acceptable numbers), the CATI system moves on to asking for ratings of individual aspects of the subway lines. In designing the questionnaire, the survey team recognized that this rating portion of the interview would probably be quite repetitive for respondents, and they were concerned that respondent tiring would influence the validity of the later ratings. To mitigate this problem, the CATI system is used to randomly sort the order that the different aspects of services are presented to respondents. Some respondents are be asked to rate the helpfulness of the signs and maps early on, while others are asked about them last. The order for each respondent is determined automatically by the CATI system, so the interviewer needs only to read the questions as they come onto the screen.

The survey team did not feel that subway non-users (GROUP = 6 or 7) would be in the position to rate some of the more detailed aspects of service, so the CATI system only queries for some of the ratings for these individuals.

It is extremely difficult for interviewers to perform the sorting and skipping operations shown in the figure using pencil-and-paper interviewing techniques. CATI allowed the survey team to use these and other techniques, without the interviewer (and more importantly) the respondent knowing about the behind-the-scenes calculations and assignments.

In addition to improving the flow of the questionnaire, the CATI systems allow more respondent-specific questions to be asked. For instance, "D" line riders are asked only about the "D" line, not about other lines. This aspect of CATI is appealing to respondents because they sense that they are being listened to and that their responses are relevant to the survey effort.

Appendix D

Recent RFPs for Survey Contracting Assistance on a Household Travel/Activity Survey

Household Survey RFPs

This section consists of two household travel/activity survey RFPs:

- Oregon, 1993; and
- Dallas/Fort Worth, 1995.

HOUSEHOLD ACTIVITY AND TRAVEL BEHAVIOR SURVEY:

REQUEST FOR PROPOSAL
November 15, 1993

Metro in association with the Southwest Washington Regional Transportation Council, Mid-Willamette Valley Council of Governments, Lane Council of Governments, Rogue Valley Council of Governments and the Oregon Department of Transportation.

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1. INVITATION

To propose the conduct of a major activity, travel behavior and time use survey in the major metropolitan areas of the Willamette Valley and Southwest Washington and to field the survey(s). To design and test the survey instruments, with the help of the client(s) and an expert panel of transportation and activity researchers.

This project will involve a two day survey of daily activities and travel of all members of the household for approximately 10,000 households, dependent on the final per-household cost and the limitations of the available budget. This is the revealed preference or revealed behavior portion of the study.

The project will also involve the re-contact of each household to administer a custom stated preference survey, usually to one family member only, with 6 to 10 subset samples being drawn to explore the probable effect of specific transportation or land use policy or infrastructure investment options. These exploratory instruments will address the probable behavioral effects of actions which are outside the current experience of the respondents and which cannot be analyzed using revealed behavior. Examples are congestion pricing, widespread parking pricing, road and vehicle pricing, non-priced transportation control measures, neo-traditional urban design (pedestrian and transit supportive), bicycle paths, ubiquitous pedestrian accessibility, demand responsive transit and high speed inter-city rail.

2. PROJECT SCOPE:

A. Revealed Preference Survey Questionnaire: Fine tune design and layout prepared by client, there will be two basically different designs to pretest with response rate being important in the final choice. Pretest, choose and redesign.

B. Stated Preference Questionnaires: There will be four to ten "attitudinal" questions to be probed. These will be mailed out in a second wave to the original respondents, each respondent will get only one SP instrument for which the sample size will be of the order of 500. Which respondent gets which questionnaire will be determined by responses or situational variables uncovered in the RP response and by their willingness to be re-contacted. For example respondents with activities in areas where parking charges are levied will be probed for both perceived/actual costs and for response to cost or availability changes. Each of the SP instruments may be customized and the responses must be linked to the actual instrument used for orderly reassembly.

C. Callbacks/Re-contacts: Each sample must be re-contacted at least six times, on different days in the event of no contact/no one at home, before a replacement household is drawn.

D. Survey Retrieval: Mail-back with telephone backup where necessary.

E. Portland Metro Coverage: Clackamas, Clark, Columbia, Multnomah, Washington and Yamhill counties should form the basis for sampling.

F. Other MPO area Coverages: Lane, Marion and Jackson counties.

G. Geocoding: All households, workplaces defined by these households, and location of each of the out of home activities will be digitized to local map coordinates, by another group. This is particularly important for distance sensitive trips such as walk access to transit, walk and bicycle trips. It is important therefore that locations of activities be given adequate address description to identify the location to within 200 feet (one downtown city block). Please address this in your response.

H. Survey records/coding: For the purposes of supervision, control and response check-coding, surveys must be made available in hard copy. If a CATI system is used, this will still be necessary. Respondents must be explicit about their quality control measures as a part of the response.

l. Respondents must detail their proposed scheme to maximize the number of responses from the initially chosen sample. They must include the expected costs of over sampling and measures to maximize response.

3. SURVEY PURPOSE

The purpose of the survey is to provide information suitable for gaining an in-depth understanding of activity and travel behavior of households and individuals within the households. This data must be sufficient to form the basis for a robust and rigorously developed set of activity/travel behavior models with which to conduct policy analysis and forecast future travel under a variety of scenarios. It is proposed to do a combination of revealed and stated preference (or choice). It must be emphasized that this survey is not being fielded to get descriptive statistics for which a random sample would be needed, but to investigate and understand travel behavior.

4. MODEL BUILDING OBJECTIVES

The objectives for the models are essentially driven by the new ISTEA and CAAA requirements as well as the Oregon Land Conservation and Development Commission's Administrative Rule for Goal 12 of the State Land Use Laws, which requires a reduction in VMT per capita for long range planning.

In the long term, there is a need to consider personal trip-making as a whole in response to daily household activity needs, the constraints of time and income for the individuals within it and the disposition of shared resources. This means a paradigm of travel modeling that is different from the 4-step process established 40 years ago. In the short term the data will be used to enhance the 4-step process and need to make it as responsive possible (either through nested or iterative models, or a combination). The data gathered in a large behavioral survey of usually have a 10- to 15-year life, it is important therefore that both short and long term needs be considered in the design and conduct of this survey.

In particular, the survey will have to be designed with at least eight modeling objectives:

4.1. Conventional Models:

Estimate conventional "4-step" disaggregate models.

4.2. Urban Environment:

Respond to differences in the local urban environment, including design for street

and pedestrian continuity, heterogeneity of land use, and schemes referred to as neo-traditional.

4.3. Activity Substitution:

Respond to the needs to address substitution of in-home activities for activities requiring travel, this leads to the need for the ability to respond to the direct modeling of the activities of each member of the household.

4.4. Walk and Bicycle:

Respond to the need to consider substitution of pedestrian (walk and bicycle) modes for motorized modes in response to changes in household situation (e.g., socio-demographic, economic, pedestrian environment/design, provision of bicycling facilities, heterogeneity of land use).

4.5. Trip Chains:

Respond to the need to explicitly estimate travel in linked trip chains, and the identify the factors that affect this phenomenon. The link between this phenomenon, congestion and modal choice needs to be developed.

4.6. Household Location:

Respond to the question of household location choice and its links with car ownership and choice of mode for various activities. This as affected by socio-demographic changes of the household (life cycle, changes in structure, new household formation), and the exogenous effects of transport cost changes and travel time effects (e.g., from increasing congestion).

4.7. Car Ownership:

Car ownership/acquisition/disposition models as affected by mobility/congestion, road and fuel pricing, and cost of acquisition.

4.8. Car Utilization:

Differential utilization of the cars held by the household (air quality and fuel use issues).

4.9. Travel Demand Management:

There is a need to introduce, as far as is possible, quantitative methods to respond to Travel Demand Management (TDM) actions such as road pricing, congestion pricing, and parking supply control. Issues of the effect of urban design and the

provision of positive pedestrian and bicycle use environments will also need to be addressed by the models.

5. GEOGRAPHIC EXTENT

This request for proposals is for the design and fielding of a survey of household activity and travel for four Metropolitan Planning Organizations (MPOs) within Oregon and one in the state of Washington. The Portland, Oregon -Vancouver, Washington metropolitan area (Metro and Southwest Washington RTC), which has a population of 1.5 million requires a single instrument, while the other three areas, 100,000 to 200,000 population each, may require customized versions of the same instrument. There are many similarities in the basic needs of each of the areas, all of which will use the survey as a major input to the development of travel models which need to reproduce the complex multi-modal choice-based travel behavior of individuals in households. There is also an intent to combine the survey data from each of the MPO areas to the greatest extent possible and thereby increase the representation of rare cases (e.g. bicycle travel for work, personal business and recreation). The funding dictates that the three smaller metropolitan areas will require pooled data and a common model set.

6. SAMPLE SIZE AND CHOICE

6.1. Estimated Sample Size:

The total sample size is expected to include 9,000 -13,000 households with a Portland area range of 5,500 - 7,500 and the balance of the study areas between 3,500 - 5,500 in aggregate (equally taken from each).

6.2. Sampling Method:

Sampling should be conducted primarily by phone number, taking account of unlisted numbers and mechanisms to include people who do not have phone numbers. *Each MPO is to provide statistics on non-phone owning households for its area.*

6.3. Sample Stratification:

The sampling strategy will be a stratified sample based on 8 to 10 location categories of the immediate environment or situation, such as: traditional mixed use neighborhoods, households with immediate environments that have good pedestrian and bicycle infrastructure, households with good transit environments, and households that have only an auto infrastructure. There is also the need to deal with ex urban location, particularly in the Salem (Mid-Willamette) and Portland areas where satellite cities exist which will be affected by urban growth management and urban growth boundaries in the central part of the metropolis.

Universities that are primarily residential should be included as a geographical stratum. The intention is to be able to evaluate different household and travel environments for a range of socio-economic and life-cycle households with a multivariate technique that essentially controls for effects of life cycle and socio-economic classification. This procedure will be aimed at getting a reasonable number of cases of households that use transit, and households that use non motorized means of travel through a random sample in each of the target locations. This will of necessity lead to a relatively higher sample within the central urban areas than in the more numerous auto captive areas. In Portland it will be necessary to enrich the sample for park and ride usage by sampling households from an intercept ~~at the lots.~~ It may also be necessary to enrich the transit-using households by identifying riders as a sample frame for Eugene and Salem and the Clark County part of the Portland Region.

6.3.1. Location Categories Draft List:

1. Inner urban with good ped/bike/transit.
2. Urban - significant heterogeneity of use.
3. Outer urban with poor ped/bike/transit.
4. Light Rail accessible (Portland).
5. Suburban - some ped/bike/transit.
6. Suburban - no ped/bike/transit.
7. Ex urban - rural.
8. Satellite city.
9. University residence.

Not all categories will be found in each MPO area.

Sampling need not be stratified by household life cycle stages.

6.4. Transit User Subsample:

The sample will need enrichment by a transit user subsample in the Clark County (Washington) portion of the Portland area, and the Salem and Eugene areas. It is probable that 400 to 600 transit using households will need to be identified from a random sampling of riders in each area, with the aim of obtaining 300 to 400 completed household surveys from this group. The same will be true for a park and ride lot user subsample in the Oregon portion of the Portland area. The transit using subsample shall complete the same survey instrument as the main household sample.

6.5. Household Definition:

The household should be defined as follows: "all people currently living with you in the same dwelling who typically share meals together as well as share at least part

of their income." This definition would define roommates, who only share expenses, or children away at college, as separate households.

6.6. Completed Household Response Definition:

Completed household response will be defined as completed travel diaries for all persons, for all days of the implied survey.

6.7. Household Mode Definition:

Transit, pedestrian or bicycle using household means: any household that had any trips by these modes for either of the survey days.

7. PROPOSED SURVEY METHODOLOGY

The following is a guide to clarify our intent, proposers are at liberty to expand upon this proposal or to suggest a different methodology which will accomplish the objectives.

Draw a random digit dialing sample for specific prefixes covering areas selected for stratification. Obtain addresses from a reverse directory for those listed. Geocode (client or client's contractor) and choose initial sample based on actual location. Determine the percentage of locational "hits" for each prefix.

Using the above hit rate as a guide, recruit unlisted households or ones without known addresses. The recruitment of unlisted households will require address information. Geocode recruited unlisted households (client or clients contractor) and choose initial sample based on location.

Mail introductory letters to all randomly selected telephone numbers with known addresses.

Conduct phone recruitment within two days of expected receipt of introductory mailing; socio-demographic information should be obtained at initial contact as well as limited travel information to set the tone for the survey and to provide data to correct for non-response bias.

Households not using telephone services should be identified. STF3 block group data may be used to target neighborhoods with low phone ownership. Additionally, Non-phone-using households may be recruited by asking households if another household shares their phone.

The publicity plan should be addressed by the contractor (e.g., contact public safety officials, radio stations, and other points of contact to inform them that the

survey is taking place). A "1-800" number should be provided for return calls from households with answering machines as well as to verify survey authenticity.

Call-backs should amount to at least six calls before drawing a replacement sample.

Survey diaries should be mailed to respondents at preferred address prior to assigned travel days and returned by mail. Follow up phone calls and mail-out reminders should be used to elicit response.

Activity and travel diaries should be completed for all members of the household.

The activity and travel diaries will be for two consecutive days, equally distributed over the seven day week.

An appropriate incentive to improve response rate may be used (e.g., cash (Puget Sound used a new $2 bill), basketball tickets, lottery tickets etc.). To be tested during the pretest.

8. SURVEY INSTRUMENT(S)

8.1. Activity Diary (Revealed Preference):

Survey diary should focus on activities. Open descriptions of activities should be elicited from individuals and subsequently coded.

A question should be asked whether the survey respondents are willing to participate in a follow-up questionnaire (a stated preference survey).

A pretest survey should include a focus group which examines alternative survey instrument formats (e.g., single sheet versus booklet).

Contractor should address item non-response (e.g., on income, vehicle ownership levels, household life cycle stage). Household income should be addressed in initial phone contact as well as in the mail out survey.

8.2. Stated Preference/Choice:

Stated preference surveys will be administered to sub samples defined on the basis of existing residential location and travel patterns. These mail out surveys will be customized based on the information previously collected and may be retrieved by mail back or phone, to be specified in the proposal and during the design phase. These surveys should include the following issues: residential location design characteristics, non-traditional transit improvements (e.g. demand

responsive transit) and new technology, parking availability and cost, road pricing and tolls, issues of telecommuting and flexible work schedules, and the possible effects of the provision of bicycle path/route infrastructure.

Previous SP studies of traveler behavior (refs.) have shown that customized SP choice designs are effective in eliciting realistic responses and provide data that can be analyzed in a variety of ways. In such choice designs respondents are asked to choose one alternative from a set of two (preferably more) alternatives; each alternative is defined in terms of levels of attributes according to an experimental design. Alternative specification will be provided to the contractor. Due to customization and experimental design considerations, it may be anticipated that a respondent from each household will receive a unique SP survey.

9. DATA ENTRY

All information obtained from the survey shall be coded and entered on electronic medium. Address/location information to be entered in full with careful supervision and editing to ensure completeness for later geocoding.

Forms received shall be coded and entered within 24 hours of receipt. Checking for completeness, consistency and accuracy shall be complete within 48 hours of receipt. This will be necessary in order to complete geocoding and prepare the stated preference mail-out within two weeks of receipt.

The task of designing the editing and consistency checks is the responsibility of the proposer, subject to review and approval by the client.

Geocoding of household and activity locations to map coordinates (i.e., lat/long) will be completed by separate contract, probably using the client's GIS facilities.

Data entry for the SP will include a record of responses together with specification of the customized design.

10. TIME FRAME

It is our intention to let the contract by January 1, 1993.

The instrument design, sampling strategy and method, and finalization of the survey conduct will take place during January - February of 1994. This will entail close cooperation with the client and an expert panel that will be in place by January.

The revealed preference survey must be fielded during March through May and be completed before the schools break for summer.

The stated preference surveys may be lagged by one month, so that there will be overlap between the two survey phases.

The survey will be implemented prior to the spring of 1994 and will take at least 3 months to collect data. The SP can spill into the early summer.

Deliverable (i.e., clean) data files should be available three months after completion of survey.

11. SURVEY CONTENT (Revealed Preference Portion)

A. Household data

Number of persons in household
Dwelling/structure unit type
Length of residence at present address
Previous residence address
Owner/renter tenure
Household income
Household location
Person roster
Vehicle roster (i.e., cars, trucks, bikes) in phone contact
Detailed vehicle information (mail out)
Number of phone lines at household

B. Person Data

Name and relationship to head of household
Gender, age
Driver's license
Employment status (allow multiple responses)
School status (allow multiple resdponses)

Location of work and school place(s)
Mode to work (usual/previous week)
Mode to School (usual/previous week)
Disability (open ended)
Occupation of worker - open ended - code to SOC.
Industry of worker - open ended - code to SIC.
Duration of current employment
Previous employment location

C. Activity and travel data (for each person)

Activity type (includes major in-home activities)(open ended collection)
Activity location
Time start/finish
Travel to Activity? - Yes go to travel description, no go to next activity.
Estimated duration of travel
Perceived cost of parking at activity
Means of travel (All modes including bike and walk)

Car: Driver/rider
Carpool
Number of people in vehicle
Actual cost of parking (note subsidy via employer or purchase)
Vehicle used (if from household)

Transit: Mode of access/ location of access
Line(s) used (open ended)
Transfer locations (open ended)
Mode of egress/ location of egress
Transit fare/type

12. QUALIFICATIONS:

The proposer will have to meet the following basic requirements in terms of experience and skills.

12.1. Experience:

12.1.1. Revealed Preference:

Have demonstrated experience in fielding multi-day travel diaries, household activity diaries (for all members of the household) or time use surveys. Experience with fielding multi-wave panel surveys will be an added recommendation.

12.1.2. Stated Preference:
Have knowledge and experience in fielding sophisticated stated preference and/or stated choice surveys. This would include respondent customization and question rotation.

12.2. Resources/Capability:
The proposer(s) must be prepared to demonstrate their ability to complete a fielding project of this size in the time specified.

13. ESTIMATED COST

Cost estimates must be broken down by the basic project phases. There are two basic classifications, but a breakdown below this level to tasks will be required:

A. Instrument development and design, including determining the sampling technique and preparation for the survey.

B. Survey fielding, retrieval, checking and coding.

It is the intention at present, to choose the contractor as a group of MPOs. The contract will at that point be broken up into 5 contracts with the legal contracts for each MPO being entered into. The development costs will at that stage be pro-rated (based on sample size) to each of the participants, in essence as a per completed household overhead rate. In the event that any one of the participants withdraws at that stage, it is important that there is a mechanism for re-allocating the shared development costs.

14. PROJECT RESOURCES:

A. Metro: approximately $550,000
B. State of Oregon (Statewide) approximately $ 500,000
C. Southwest Washington RTC approximately $ 200,000

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS

METROPOLITAN PLANNING ORGANIZATION

REQUEST FOR PROPOSAL
FOR A HOUSEHOLD SURVEY
IN THE DALLAS-FORT WORTH METROPOLITAN AREA

June 1994

REQUEST FOR PROPOSAL
FOR A HOUSEHOLD SURVEY
IN THE DALLAS-FORT WORTH METROPOLITAN AREA

The North Central Texas Council of Governments (NCTCOG) is requesting written proposals from consultants to conduct a household survey during the fall of 1994 and spring of 1995. In conjunction with major external, workplace, and transit surveys, the information collected from the household survey will serve primarily to improve the transportation planning process in the Dallas-Fort Worth Metropolitan Area. All surveys conducted by consultants for NCTCOG will be coordinated with the Texas Department of Transportation (TxDOT), the Federal Highway Administration (FHWA), Federal Transit Administration (FTA), and local agencies.

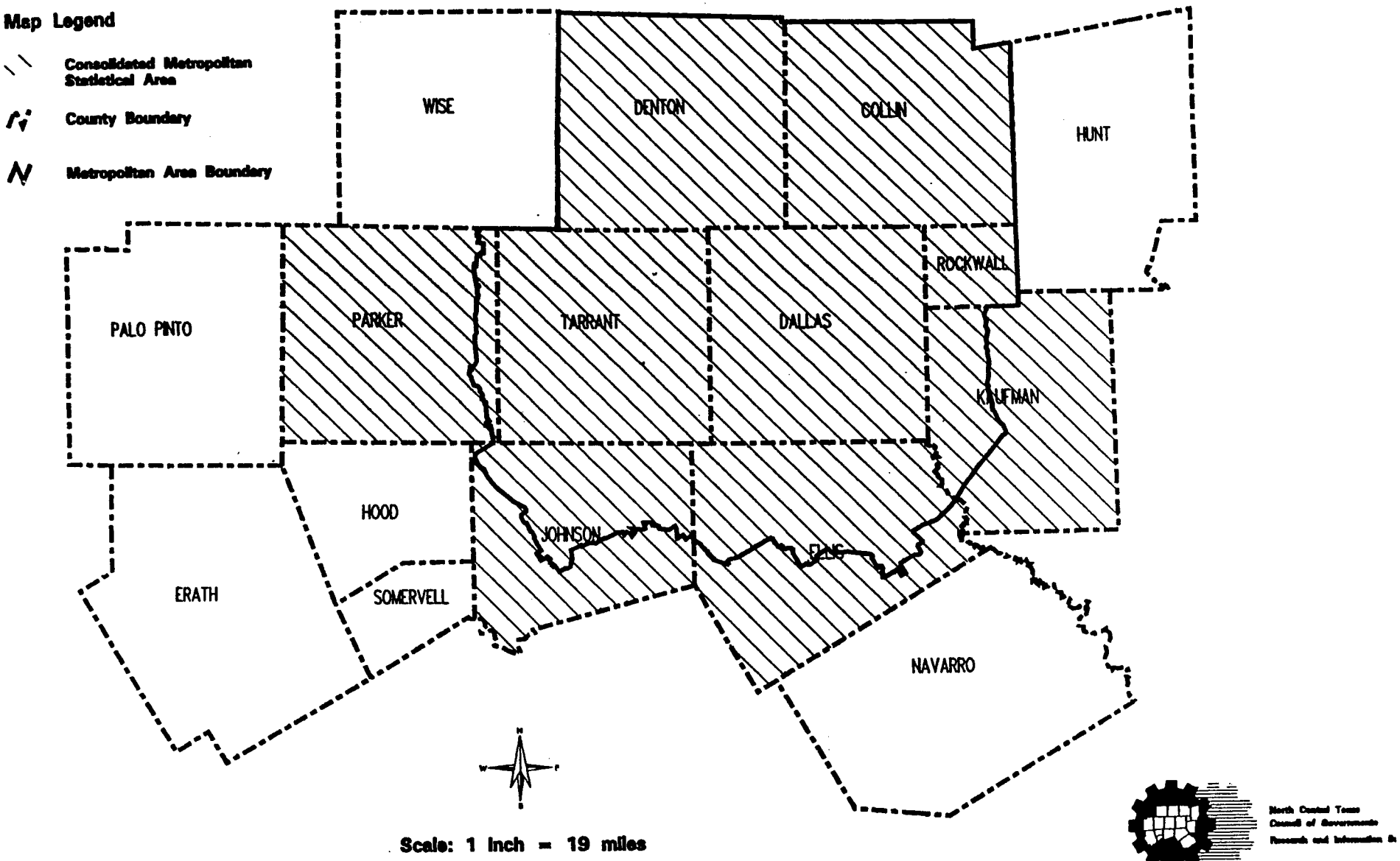
NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS

The North Central Texas Council of Governments was established in 1966 as a voluntary association of cities, counties, and school districts within the 16-county North Central Texas Region. Since 1974, NCTCOG has served as the Metropolitan Planning Organization (MPO) for the North Central Texas area, and provides technical assistance and staff support to the MPO policy-making structure known as the Regional Transportation Council. In addition, NCTCOG assists local governments and transportation providers in planning, coordinating, and implementing transportation decisions.

The boundaries for the 16-county NCTCOG region, the nine-county Dallas-Fort Worth Consolidated Metropolitan Statistical Area (CMSA), and the Metropolitan Area are shown in Figure 1. Estimated 1994 population (as of January 1, 1994) is 4.3 million for the 16-county region, 4.1 million for the CMSA, and 4.0 million for the Metropolitan Area. The 4,960 square-

FIGURE 1

Dallas - Fort Worth Region (16 Counties)



June 02, 1994

mile Metropolitan Area (as adopted in 1992) includes all of Collin, Dallas, Denton, Rockwall, and Tarrant Counties and portions of Ellis, Johnson, Kaufman, and Parker Counties.

BACKGROUND

Comprehensive regional travel surveys in the Dallas-Fort Worth area were last conducted in 1984 and consisted of the following:

- **The household survey** was conducted in the spring and summer of 1984. A total of 6,403 persons over the age of four residing in 2,471 households were interviewed at their place of residence. Figures 2 and 3 show the survey forms that were used. The survey was originally designed to be completed by Memorial Day, before schools closed; however, a higher-than-expected household refusal rate prolonged the survey through the first half of July. In analyzing the data, a statistically significant difference was found between the pre- and post-Memorial Day trip rates. Since the rates for the travel model were intended to represent school year travel patterns, the post-Memorial Day trip records were deleted and all trip rates developed from the pre-Memorial Day sample of 1,600 households.

- **The workplace survey** was conducted in the summer and fall of 1984. A total of 474 nonresidential establishments and seven special generators were surveyed. Figures 4 and 5 show the survey forms that were used. Since arrival count data was not available for 120 of these surveyed establishments, only 354 establishments were actually used to estimate trip attraction rates.

- **The on-board transit survey** was conducted in the fall of 1984. Approximately 10,000 riders on four fixed-route bus systems were surveyed to determine various ridership characteristics such as trip purpose, access mode, and percentage of trips made by transit (Figure 6 shows the survey form). On-board surveys were also conducted in 1986 and 1991 for the Fort Worth Transportation Authority (FWTA) and in 1991 for the Dallas Area Rapid Transit Authority (DART).

The results of the 1984 surveys were compared against the results of regional surveys conducted 20 years earlier in 1964 (see Table 1). The 1984 survey results, as well as summaries of 1980 U.S. Census Journey-to-Work data and traffic and transit ridership counts, were used extensively in the late 1980s to update the Dallas-Fort Worth Regional Travel Model (DFWRTM). Appendix A contains a description of the region's existing travel demand

FIGURE 2

Travel Day _____ and Date ☐☐☐

Sample Number ☐☐☐☐

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS HOME INTERVIEW SURVEY

Section I: Household Data

A. Sample Address _____ ☐☐☐☐☐☐
House Number, Street Name, Apt. No. | City/Town | County | Zip Code

B. Structure Type _____ ☐

C. Number of People Living at this Address _____ ☐☐

D. Number of People Age 5 and Over Living at this Address _____ ☐☐

E. Number of Out-of-Area Visitors Staying at this Address _____ ☐

F. Number of Passenger Cars, Vans, and Pickups Available for Use _____ ☐

G. Household Income: (Do Not Ask Until Interview Is Complete) _____ ☐

Section II: Data on Persons Age 5 and Over

A	B	C	D	E	F	G	H	I	J	K
Person Number	✓ If Interviewed	Relation To Head	Age	Sex	Licensed to Drive?	Occupation	Industry	Worked on Travel Day?	Made Trips While at Work?	Made Other Trips on Travel Day?
01		Head ☐1	☐	1 M 2 F	1 YES 2 NO	☐☐		1 YES 2 NO 3 Worked at Home	1 YES 2 NO	1 YES 2 NO
02		☐	☐	1 M 2 F	1 YES 2 NO	☐☐		1 YES 2 NO 3 Worked at Home	1 YES 2 NO	1 YES 2 NO
03		☐	☐	1 M 2 F	1 YES 2 NO	☐☐		1 YES 2 NO 3 Worked at Home	1 YES 2 NO	1 YES 2 NO
04		☐	☐	1 M 2 F	1 YES 2 NO	☐☐		1 YES 2 NO 3 Worked at Home	1 YES 2 NO	1 YES 2 NO
05		☐	☐	1 M 2 F	1 YES 2 NO	☐☐		1 YES 2 NO 3 Worked at Home	1 YES 2 NO	1 YES 2 NO
06		☐	☐	1 M 2 F	1 YES 2 NO	☐☐		1 YES 2 NO 3 Worked at Home	1 YES 2 NO	1 YES 2 NO
07		☐	☐	1 M 2 F	1 YES 2 NO	☐☐		1 YES 2 NO 3 Worked at Home	1 YES 2 NO	1 YES 2 NO
08		☐	☐	1 M 2 F	1 YES 2 NO	☐☐		1 YES 2 NO 3 Worked at Home	1 YES 2 NO	1 YES 2 NO
09		☐	☐	1 M 2 F	1 YES 2 NO	☐☐		1 YES 2 NO 3 Worked at Home	1 YES 2 NO	1 YES 2 NO
10		☐	☐	1 M 2 F	1 YES 2 NO	☐☐		1 YES 2 NO 3 Worked at Home	1 YES 2 NO	1 YES 2 NO

Age Codes

1 5 - 10
2 11 - 15
3 16 - 20
4 21 - 25
5 26 - 36
6 36 - 45
7 46 - 55
8 56 - 65
9 65 - OVER
0 UNKNOWN

Relation Codes

1 HEAD
2 SPOUSE
3 SON
4 DAUGHTER
5 GRANDPARENT
6 GRANDCHILD
7 OTHER RELATIVE
8 UNRELATED
9 OUT-OF-AREA VISITORS
0 UNKNOWN

Section III: Trip Summary

A. Total Vehicular Trips Reported _____ ☐☐☐

B. Persons Age 5 and Over Making Trips _____ ☐☐☐

C. Persons Age 5 and Over Not Making Trips _____ ☐☐☐

D. Complete or Incomplete Interview Code _____ ☐

Section IV: Administrative

A. Household Telephone Number _____

B. Interviewer _____

C. Telephone Contacts (If Any) :

Date	Time	Purpose/Outcome

D. Personal Contacts In Household:

Date	Time	Talked To/Comments

E. Completed Interview Submitted:

Date: _____ By: _____

I Certify That All Information On This Form Is Correct And True.

_____
Signature of Interviewer

F. If Interview Submitted Incomplete

Interviewer's Reason: _____

_____ Date _____ Initials

Supervisor's Comments _____

_____ Date _____ Initials

G. First Edit: Fail Pass

_____ Date _____ Initials

H. Final Edit: Fail Pass

_____ Date _____ Initials

I. Coding Complete

_____ Date _____ Initials

HIS - 1

FIGURE 3

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS

Trip Report

CONFIDENTIAL
The information obtained in this survey will be accorded confidential treatment, and will be used for statistical purposes only.

Section V: Trip Report

Travel Day _____ and Date _____ Sheet ___ of ___

A	B	C	D	E		F		G		H	I	J	K	L
PERSON NUMBER	TRIP NUMBER	WHERE DID THIS TRIP BEGIN? (ORIGIN)	WHERE DID THIS TRIP END? (DESTINATION)	TRIP PURPOSE		LAND-USE (Type of Activity)		TIME OF TRIP		Mode of Travel	If Auto Driver, Number of Passengers in Car Including Driver	If Car/Van Pool, Number of Passengers Including Driver	If Transit, Mode of Access	Transit Fare/ Parking Cost
				From	To	ORIGIN	DESTINATION	START	ARRIVAL					
		Address/Intersection Place (City) Zip Code	Address/Intersection Place (City) Zip Code			Type of Activity	Type of Activity	Circle AM PM N M Time	Circle AM PM N M Time					$.
		Address/Intersection Place (City) Zip Code	Address/Intersection Place (City) Zip Code			Type of Activity	Type of Activity	Circle AM PM N M Time	Circle AM PM N M Time					$.
		Address/Intersection Place (City) Zip Code	Address/Intersection Place (City) Zip Code			Type of Activity	Type of Activity	Circle AM PM N M Time	Circle AM PM N M Time					$.
		Address/Intersection Place (City) Zip Code	Address/Intersection Place (City) Zip Code			Type of Activity	Type of Activity	Circle AM PM N M Time	Circle AM PM N M Time					$.
		Address/Intersection Place (City) Zip Code	Address/Intersection Place (City) Zip Code			Type of Activity	Type of Activity	Circle AM PM N M Time	Circle AM PM N M Time					$.
		Address/Intersection Place (City) Zip Code	Address/Intersection Place (City) Zip Code			Type of Activity	Type of Activity	Circle AM PM N M Time	Circle AM PM N M Time					$.
		Address/Intersection Place (City) Zip Code	Address/Intersection Place (City) Zip Code			Type of Activity	Type of Activity	Circle AM PM N M Time	Circle AM PM N M Time					$.
		Address/Intersection Place (City) Zip Code	Address/Intersection Place (City) Zip Code			Type of Activity	Type of Activity	Circle AM PM N M Time	Circle AM PM N M Time					$.

PURPOSE CODES:

1. HOME
2. WORK
3. SHOP
4. SCHOOL
5. SOCIAL/REC.
6. PERSONAL BUS.
7. EAT MEAL
8. SERVE PASSENGER
9. CHANGE MODE
0 RIDE

MODE OF TRAVEL CODES:

1. AUTO DRIVER
2. AUTO PASSENGER
3. BUS/TROLLEY
4. SCHOOL BUS
5. TAXI
6. MOTORCYCLE
7. CAR/VAN POOL
8. WALK/BICYCLE
9. OTHER

TRANSIT ACCESS CODES:

1. WALK
2. DROVE AUTO & PARKED
3. AUTO, BUT NOT PARKED
4. CAR POOL
5. OTHER

HIS - 2

FIGURE 4

North Central Texas Council of Governments

1984 EMPLOYEE TRAVEL SURVEY

The North Central Texas Council of Governments is sponsoring a survey of travel in the Dallas-Fort Worth area. We ask your cooperation by answering each of the questions below. If possible, please return this questionnaire to the person who gave it to you.

YOUR ANSWERS WILL BE KEPT CONFIDENTIAL AND WILL ONLY BE USED TO PRODUCE STATISTICAL DATA NEEDED TO IMPROVE TRANSPORTATION SERVICES IN THE AREA.

A. At what TIME do you usually arrive at work?

___:___ A.M. P.M. (write time and circle A.M. or P.M.)

B. HOW did you travel to work this morning? (Circle number)

1. I drove by myself.
2. I drove a car with others as passengers.
3. I was a passenger in a car driven by someone else.
4. I walked or bicycled.
5. I rode a motorcycle.
6. I rode in a vanpool.
7. I rode in a taxi.
8. I rode a bus.

C. If you traveled to work by auto, truck, or van, HOW MANY PERSONS were in the vehicle, including yourself? _____ (enter number of persons)

D. If you were the DRIVER today, how much did you PAY TO PARK?

☐ Free I paid $_____.____

E. If you were the DRIVER today, how many BLOCKS away from work did you park?

☐ 1 or less ☐ 2 ☐ 3 ☐ 4 ☐ more than 4

F. If you traveled BY BUS to get to work today, how did you get to your first bus stop? (Circle number)

1. I drove by myself.
2. I drove a car with others as passengers.
3. I was a passenger in a car driven by someone else.
4. I walked or bicycled.
5. I rode a motorcycle.
6. I rode in a vanpool.
7. I rode in a taxi.

G. Did you make any STOPS on your way TO work today? (Check yes or no)

☐ No, I traveled directly to work.

☐ Yes, I made the following stops:

IF YES, please check the purpose for EACH stop

PURPOSE OF STOP	STOP MADE 1st Stop	2nd Stop	3rd Stop	4th Stop
Work Related	1 ☐	1 ☐	1 ☐	1 ☐
Shopping	2 ☐	2 ☐	2 ☐	2 ☐
School	3 ☐	3 ☐	3 ☐	3 ☐
Social/Recreational	4 ☐	4 ☐	4 ☐	4 ☐
Personal Business	5 ☐	5 ☐	5 ☐	5 ☐
Eat a Meal	6 ☐	6 ☐	6 ☐	6 ☐
Pick-Up or Drop Off a Passenger	7 ☐	7 ☐	7 ☐	7 ☐

N Mailed, Please Fold Along Dashed Line

H. Did you make any STOPS on your way home FROM work yesterday (or your last weekday at work)?

☐ No, I traveled directly home.

☐ Yes, I made the following stops:

IF YES, please check the purpose for EACH stop

PURPOSE OF STOP	STOP MADE 1st Stop	2nd Stop	3rd Stop	4th Stop
Work Related	1 ☐	1 ☐	1 ☐	1 ☐
Shopping	2 ☐	2 ☐	2 ☐	2 ☐
School	3 ☐	3 ☐	3 ☐	3 ☐
Social/Recreational	4 ☐	4 ☐	4 ☐	4 ☐
Personal Business	5 ☐	5 ☐	5 ☐	5 ☐
Eat a Meal	6 ☐	6 ☐	6 ☐	6 ☐
Pick-Up or Drop Off a Passenger	7 ☐	7 ☐	7 ☐	7 ☐

I. Did you make a trip(s) during working hours yesterday (or your last weekday at work)?

☐ No ☐ Yes If yes, please check purpose for each trip.

1ST TRIP PURPOSE	2ND TRIP PURPOSE	3RD TRIP PURPOSE	4TH TRIP PURPOSE
1 ☐ Work Related	1 ☐ Work Related	1 ☐ Work Related	1 ☐ Work Related
2 ☐ Shopping	2 ☐ Shopping	2 ☐ Shopping	2 ☐ Shopping
3 ☐ School	3 ☐ School	3 ☐ School	3 ☐ School
4 ☐ Social/Recreational	4 ☐ Social/Recreational	4 ☐ Social/Recreational	4 ☐ Social/Recreational
5 ☐ Personal Business	5 ☐ Personal Business	5 ☐ Personal Business	5 ☐ Personal Business
6 ☐ Eat a Meal	6 ☐ Eat a Meal	6 ☐ Eat a Meal	6 ☐ Eat a Meal
7 ☐ Pick-Up/Drop Off a Passenger	7 ☐ Pick-Up/Drop Off a Passenger	7 ☐ Pick-Up/Drop Off a Passenger	7 ☐ Pick-Up/Drop Off a Passenger
8 ☐ Home	8 ☐ Home	8 ☐ Home	8 ☐ Home
MEANS OF TRAVEL	**MEANS OF TRAVEL**	**MEANS OF TRAVEL**	**MEANS OF TRAVEL**
1 ☐ Auto	1 ☐ Auto	1 ☐ Auto	1 ☐ Auto
2 ☐ Bus	2 ☐ Bus	2 ☐ Bus	2 ☐ Bus
3 ☐ Other	3 ☐ Other	3 ☐ Other	3 ☐ Other
AND THEN:	**AND THEN:**	**AND THEN:**	**AND THEN:**
1 ☐ Back to Work	1 ☐ Back to Work	1 ☐ Back to Work	1 ☐ Back to Work
2 ☐ To 2nd Trip	2 ☐ To 3rd Trip	2 ☐ To 4th Trip	2 ☐ To Next Trip (cont. on back)

J. How many AUTOS, PICKUPS, and VANS are available for use by members of your household? _____ (enter number)

K. What is your OCCUPATION? _____ ☐

L. What is your home ADDRESS?

☐ _____ _____ _____

Number and Street City Zip Code

M. What is your annual HOUSEHOLD INCOME? (Circle number)

1. Less than $5,000
2. $ 5,000-$ 9,999
3. $10,000-$14,999
4. $15,000-$19,999
5. $20,000-$24,999
6. $25,000-$29,999
7. $30,000-$34,999
8. $35,000-$39,999
9. $40,000-$50,000
10. More than $50,000

WPS

FIGURE 5

North Central Texas Council of Governments

1984 NON-EMPLOYEE TRAVEL SURVEY

The North Central Texas Council of Governments is sponsoring a survey of travel in the Dallas-Fort Worth area. We ask your cooperation by answering each of the questions below. If possible, please return this questionnaire to the person who gave it to you. If not, just place it in any mailbox.

YOUR ANSWERS WILL BE KEPT CONFIDENTIAL AND WILL ONLY BE USED TO PRODUCE STATISTICAL DATA TO IMPROVE TRANSPORTATION SERVICES IN THE AREA.

A. Is your regular place of employment at this address? (Circle number)

1. Yes
2. No

IF YOU ANSWERED "YES" TO QUESTION A, DO NOT ANSWER THE REMAINING QUESTIONS AND PLEASE RETURN THIS FORM TO THE PERSON WHO GAVE IT TO YOU.

IF YOU ANSWERED "NO," PLEASE CONTINUE.

B. At what TIME did you arrive here today? (Circle number)

1. Before 7:00 A.M.
2. 7:00 A.M. to 9:00 A.M.
3. 9:00 A.M. to 3:00 P.M.
4. 3:00 P.M. to 6:00 P.M.
5. After 6:00 P.M.

C. Where did you START the trip that brought you to this address?

☐ _____ _____ _____

Street Address (or nearest intersection or place name) City Zip Code

Is this your home? ☐ Yes ☐ No

D. HOW did you get here? (Circle number)

1. I drove by myself.
2. I drove a car with others as passengers.
3. I was a passenger in a car driven by someone else.
4. I walked or bicycled.
5. I rode a motorcycle.
6. I rode in a vanpool.
7. I rode in a taxi.
8. I rode a bus.

E. If you traveled to this place by auto, truck, or van, HOW MANY PERSONS were in the vehicle, including yourself? _____ (enter number of persons)

F. If you were the driver today, how many BLOCKS away from here did you park?

☐ 1 or less ☐ 2 ☐ 3 ☐ 4 ☐ more than 4

G. If you traveled BY BUS to get to this place, how did you get to your first bus stop? (Circle number)

1. I drove by myself.
2. I drove a car with others as passengers.
3. I was a passenger in a car driven by someone else.
4. I walked or bicycled.
5. I rode a motorcycle.
6. I rode in a vanpool.
7. I rode in a taxi.

H. What is the REASON for your trip here? (Circle number)

1. I work here
2. Work related
3. Shopping
4. School
5. Social/recreational
6. Personal business
7. Eat a meal
8. Pick up or drop off a passenger

WPS-2

Transit Rider Survey

Preguntas Para Personas Que Usan El Autobus

FIGURE 6

TO TRANSIT RIDERS: In order to better plan transit services, we need to learn more about your travel patterns. Please answer the following questions about the trip you are now making. Please complete this questionnaire, even if you have already filled one out in the last 8 weeks. Thank you for your help.

1. I got on this bus at _____ & _____
   Nearest Street Intersection

2. The place I have come from is _____ Is this home? ☐ Yes ☐ No
   Address or Street Intersection

3. I am getting off this bus at _____ & _____
   Nearest Street Intersection

4. The place I am going to is _____ Is this home? ☐ Yes ☐ No
   Address or Street Intersection

5. The reason for this trip is: ☐ Work related ☐ Shopping ☐ School ☐ Social/Recreational ☐ Personal Business ☐ Eat a Meal ☐ Other

6. How did you get to this bus? ☐ By Auto/Parked ☐ By Auto/Dropped Off ☐ Transfer from Another Bus(es) _____ ☐ Walk ☐ Other
   Route Name(s)

7. After leaving this bus, how will you get to your final destination? ☐ By Auto/Parked ☐ By Auto/Picked Up ☐ Transfer to Another Bus(es) _____ ☐ Walk ☐ Other
   Route Name(s)

8. How did you pay for this bus ride?

		Type	Zone (Dallas Only)
☐ Cash _____ *How much?*	☐ Monthly Pass *(Please circle type and zone)*	Adult / Senior Citizen / Handicapped	1 2 3
☐ Token (Citran Only)			
☐ Transfer	☐ Punch Card *(Please circle type and zone)*	Adult / Student	1 2 3
☐ Other _____ *Please specify*			

9. How many round trips do you take by bus during a typical week (Monday through Friday)?
   ☐ 1 ☐ 2-4 ☐ 5-7 ☐ 8-10 ☐ 10 or More

10. How many cars, pickups, and vans are available to your household?
    ☐ None ☐ 1 ☐ 2 ☐ 3 ☐ 4 or More

11. Sex: ☐ M ☐ F

12. What is your age? _____

13. How many persons in your household? _____

14. To which major ethnic group do you belong:
    ☐ White ☐ Black American ☐ Hispanic-American ☐ Other _____
    Please specify

15. What is your annual HOUSEHOLD income?

☐ Less than $ 5,000	☐ $ 5,000 - $ 9,999	☐ $10,000 - $14,999
☐ $15,000 - $19,999	☐ $20,000 - $24,999	☐ $25,000 - $29,999
☐ $30,000 - $34,999	☐ $35,000 - $39,999	☐ $40,000 - $50,000
		☐ More than $50,000

If you have additional comments about transit service in your area or any suggestions on new services you would like to see, please write them on the back of this card.

After completing this card, please fold and return it to the survey worker on the bus or drop it in any mail box postage-free. Thank You.

PARA PERSONAS QUE USAN EL AUTOBÚS: Necesitamos saber mas de sus viajes en los autobuses para poder darles mejor servicio. Por favor conteste las siguientes preguntas en relación a este viaje. Por favor llene este questionario aunque ya aiga llenado uno en las ultimas ocho (8) semanas. Gracias por su ayuda.

1. Yo bordé este autobús en: _____ y _____
   Calle *Esquina*

2. El lugar de donde va es: _____ ¿Es este lugar su casa? ☐ Si ☐ No
   (Dirección o Esquina)

3. ¿Donde se va abejar de este autobús? _____ y _____
   Calle *Esquina*

4. El lugar abonde Ud. va es: _____ ¿Es este lugar su casa? ☐ Si ☐ No
   (Dirección o Esquina)

5. El proposito de su viaje es: ☐ Trabajo ☐ De Compras ☐ Escuela ☐ Social/Recreacion ☐ Negocio Personal ☐ Ir a Comer ☐ Otro

6. ¿Como llego Ud. a este autobús? ☐ Automovil y lo estaciono ☐ Pasajero de Automovil ☐ Transbordo a otro Autobús _____ ☐ En Pie ☐ Otro Modo
   Nombre de la ruta

7. Despúes de que abaje este autobús, ¿como va Ud. terminar su viaje? ☐ Automovil y lo estaciono ☐ Pasajero de Automovil ☐ Transbordare a otro Autobús _____ ☐ En Pie ☐ Otro Modo
   Nombre de la ruta

8. ¿Como pago Ud. por este autobús?

		Tipo	Zona (Dallas solamente)
☐ En Efectivo _____ *Cuanto*	☐ Pase de un mes *(Marque el tipo y la zona)*	Adulto / Anciano / Desabilitado	1 2 3
☐ Ficha (Citran solamente)			
☐ Transborde	☐ Tarjeta de ponchar *(Marque el tipo y la zona)*	Adulto / Estudiante	1 2 3
☐ Otro Modo _____ *Explique*			

9. ¿Cuantos viajes por volver usa el autobús en una semana (Lunes a Viernes)?
   ☐ 1 ☐ 2-4 ☐ 5-7 ☐ 8-10 ☐ 10 o Mas

10. ¿Cuantos Carros, Trocas, o Vans tiene en su familia?
    ☐ Ninguno ☐ 1 ☐ 2 ☐ 3 ☐ 4 o Mas

11. Sexo: ☐ Hombre ☐ Mujer

12. ¿Que es su edad? _____

13. ¿Cuantas personas hay en su familia? _____

14. ¿Qual es su grupo ethnico? ☐ Hispano ☐ Otro _____
    Explique

15. ¿Que es su ingreso por año de la familia?

☐ Menos de $ 5,000	☐ $ 5,000 - $ 9,999	☐ $10,000 - $14,999
☐ $15,000 - $19,999	☐ $20,000 - $24,999	☐ $25,000 - $29,999
☐ $30,000 - $34,999	☐ $35,000 - $39,999	☐ $40,000 - $50,000
		☐ $50,000 o Mas

Si Ud. tiene comentarios adicionales sobre el servicio de tránsito en su area o sujestiones en otros servicios que desea, por favor escribalos atraş de esta tarjeta.

Despúes de que llene esta tarjeta, doble la tarjeta y regresca a la persona tomando o puede poner en cualquier caja de correo, no necesita estampilla. Gracias.

TABLE 1
DALLAS-FORT WORTH REGIONAL TRENDS OBTAINED FROM TRAVEL SURVEYS

VARIABLE	1964 Survey	1984 Survey	1984/ 1964
AUTOS PER HOUSEHOLD	1.33	1.84	1.38
AUTOS PER PERSON	0.41	0.72	1.76
PERSON TRIPS PER HOUSEHOLD			
Home-Based Work Purpose	1.91	2.29	1.20
Home-Based Nonwork Purpose	5.42	4.32	0.80
Nonhome-Based Purpose	1.70	2.07	1.22
Total	9.03	8.68	0.96
PERSON TRIPS PER PERSON			
Home-Based Work Purpose	0.57	0.90	1.58
Home-Based Nonwork Purpose	1.62	1.69	1.04
Nonhome-Based Purpose	0.54	0.81	1.50
Total	2.73	3.40	1.25
AUTO OCCUPANCY			
Home-Based Work Purpose	1.18	1.13	0.96
Home-Based Nonwork Purpose	1.70	1.55	0.91
Nonhome-Based Purpose	1.46	1.39	0.95
Average	1.52	1.36	0.89
VEHICLE TRIPS PER PERSON			
Home-Based Work Purpose	0.48	0.80	1.67
Home-Based Nonwork Purpose	0.95	1.10	1.16
Nonhome-Based Purpose	0.37	0.60	1.62
Total	1.80	2.50	1.39
AVERAGE VEHICLE TRIP LENGTH, MILES			
Home-Based Work Purpose	8.50	10.40	1.22
Home-Based Nonwork Purpose	4.80	5.64	1.18
Nonhome-Based Purpose	5.70	6.65	1.17
Average	5.70	7.10	1.25
DISTRIBUTON OF PERSON TRIPS			
Home-Based Work Purpose	21%	27%	1.29
Home-Based Nonwork Purpose	59%	48%	0.80
Nonhome-Based Purpose	20%	25%	1.28
Total	100%	100%	1.00
DISTRIBUTION OF TRANSIT TRIPS			
Home-Based Work Purpose	45%	66%	1.46
Home-Based Nonwork Purpose	48%	19%	0.39
Nonhome-Based Purpose	7%	15%	2.35
Total	100%	100%	1.00

forecasting process. Appendix B contains tables and figures depicting general characteristics of the Dallas-Fort Worth area.

The Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 has provided additional funding to Metropolitan Planning Organizations (MPOs) to conduct major planning projects. In coordination with the Federal Highway Administration (FHWA), the Texas Department of Transportation (TxDOT), and local agencies, NCTCOG has programmed new regional travel surveys for 1994 and 1995:

- Data collection for the **external travel survey** was completed in March and April of 1994. Over 28,000 drivers were interviewed at 38 roadway locations at the point where the roadways exit the Metropolitan Area. The surveys generally took place on Tuesdays, Wednesdays, and Thursdays from 7 a.m. to 7 p.m. The survey form (see Figure 7) included questions on time of arrival, vehicle classification, vehicle occupancy, trip origin, trip purpose (for both last stop and next stop), time of departure from last stop, fuel type, vehicle year, and mileage.

- The **workplace survey** is scheduled to take place during the fall of 1994. Approximately 270 workplaces will be surveyed, with possible stratification by area type, establishment type, and number of employees. The survey design has not been finalized but is expected to include employer distribution of survey forms to employees, visitor interviews conducted by trained surveyors, and total weekday person trip and truck trip arrivals on the survey day.

- Data collection for the **household survey** is scheduled to take place during both the fall of 1994 and the spring of 1995, and is the subject of this Request for Proposal.

- An **on-board transit survey** is scheduled to take place during the spring of 1995. The survey questions have not been determined, but should be designed to improve our understanding of the decision-making process of individuals that have chosen to use transit for a particular trip. The scope of work for the transit survey will be impacted by the work done for the household survey, especially if transit passenger intercepts are used to enrich the household survey sample.

- **Other surveys** are being considered for the spring of 1995. These include a commercial (fleet vehicle) survey and special generator (i.e., additional workplace) surveys. The specific purposes and procedures for these and other surveys have not been finalized.

FIGURE 7

External Travel Survey Form
NCTCOG External Travel Survey
Dallas-Fort Worth Metropolitan

Station No _____ Interviewer _____

Station Location _____ Date _____

Dallas / Fort Worth Area
External Station Travel Survey
North Central Texas Council of Governments

TIME OF INTERVIEW	VEHICLE CLASSIFICATION	TRAILER TYPE	TOTAL AXLES	VEHICLE OCCUPANCY	TRIP ORIGIN	TRIP PURPOSE		TIME	FUEL TYPE	VEHICLE YEAR	ODOMETER
	1. Passenger Vehicle 2. Other 2-Axle, 4 Tire 3. Buses 4. 2-Axle, 6-Tire 5. Heavy Vehicles 6. Motorcycles 7. Bicycles/ Nonmotorized	0. No Trailer 1. One Trailer 2. Multi-Trailer	2 Axles 3 Axles 4 Axles 5 Axles 6 Axles 7 Axles	Number of people in vehicle. (Including driver)	*May I have the Address and City of the last place where you or a passenger got into or out of your vehicle?* (If address is unknown, identify the specific name of the location along with the nearest street and/or intersection)	1. Home/Return Home 2. Work/Return Work 3. Work Related 4. School 5. Meal 6. Recreation 7. Social 8. Shopping / Buy Gas 9. Banking, Post Office, Legal 10. Personal Business, Medical 11. Pick Up/Drop Off 12. Change mode of travel *What was/is the purpose of*		*What time did you leave your last stop?* (If unknown, how long since the last stop)	*What type of fuel does your vehicle use?* 1. Unleaded 2. Leaded 3. Diesel 4. Other (Specify)	*What is the year model of your vehicle?*	*What is the mileage of your vehicle?*
	1 2 3 4 5 6 7	0 1 2	2 3 4 5 6 7		Address City	. *your last stop* ORIGIN	*your next stop* DESTINATION		1 2 3 4		
	1 2 3 4 5 6 7	0 1 2	2 3 4 5 6 7		Address City	. *your last stop* ORIGIN	. *your next stop* DESTINATION		1 2 3 4		
	1 2 3 4 5 6 7	0 1 2	2 3 4 5 6 7		Address City	. *your last stop* ORIGIN	. *your next stop* DESTINATION		1 2 3 4		
	1 2 3 4 5 6 7	0 1 2	2 3 4 5 6 7		Address City	. *your last stop* ORIGIN	. *your next stop* DESTINATION		1 2 3 4		

PURPOSE OF HOUSEHOLD SURVEY

Cost-efficient survey programs are essential because the funds available to collect and analyze large amounts of data in any particular year are limited. Objectives for all new surveys, especially the household survey, include the following:

1. To follow the guidelines and requirements of ISTEA and the 1990 Clean Air Act Amendments.
2. To obtain data needed for re-calibration of the existing trip generation, trip distribution, mode choice, and assignment models for the Dallas-Fort Worth Metropolitan Area.
3. To provide the data needed for NCTCOG and TxDOT to test new demand model strategies.
4. To develop broader, more management-oriented (and policy-sensitive) forecasting procedures that can be integrated with other modeling tasks.
5. To help us better understand household travel behavior and an individual's activity-based decision-making process of why, where, how, and when (or whether) to make a trip.
6. To document Dallas-Fort Worth travel trends since the 1964 and 1984 surveys and compare 1994-95 results with surveys conducted in other regions. [While comparability to other surveys is a worthy goal, this should be subservient to using the best available capabilities for collecting the required data].

To facilitate the development of a strategy for the household survey, NCTCOG held a two-day "peer-review" meeting in Arlington, Texas last April of nationally recognized travel model and travel survey experts. The eight panel participants, none of whom are allowed to propose on NCTCOG's household survey, were:

- Peter Stopher, Consultant (Chairman of meeting and specialist survey consultant retained by NCTCOG), from Baton Rouge, Louisiana
- Dan Brand of Charles River Associates, from Boston, Massachusetts
- George Dresser of Texas Transportation Institute, from College Station, Texas
- Tom Golob of the University of California at Irvine, from Irvine, California
- David Hartgen of the University of North Carolina, from Charlotte, North Carolina

- Greig Harvey of Deakin, Harvey, Skabardonis, from San Francisco, California
- Keith Lawton of Portland Metro, from Portland, Oregon
- Firouzeh Nourzad of Urban Analytics, from Dallas, Texas

The panel was directed to make recommendations for a program that represents current best practice and encourages consultants to offer "state-of-the-art" innovations in their proposals. The general consensus of the panel was that the household survey was the most important of all programmed surveys and should have three integrated elements:

1. The **Revealed Preference (RP)** survey should include a two-day activity diary survey for all household members, with the two days running sequentially. Some of the households should have Friday-Saturday and Sunday-Monday sequences. The RP sample size should be as large as can be afforded, perhaps 7,500 households or more. Sample "enrichment," possibly through intercept surveys, should be considered to obtain sufficient households that use the existing I.H. 30 HOV lane the "non-HOV lane" shared ride mode, the park-and-ride mode, other transit options, the bicycle mode, and significant amounts of walking.

2. The **Stated Preference (SP)** survey should be integrated with the RP sample, so that context data are properly obtained through the RP survey. The SP survey should cover three to six issues of importance to the Dallas-Fort Worth area. Each person selected for the SP survey should be asked to respond on one issue only, with no more than one person from a household being selected.

3. A household-based **Annual Panel** (at least 1,500 households) should also be established, with a subset of the RP sample, surveyed annually at the same time each year as the original RP survey. The survey should concentrate on the activity pattern of the households and focus on changes in the number of autos, work location, residential location, and family structure.

Additional suggestions made by the panel are shown in Appendix C.

Proposals are being requested from firms with both general and specific experience to perform the revealed preference (RP) and stated preference (SP) elements of the household survey, as described in the Scope of Services identified below. The successful firm will be held

contractually responsible for providing clean, usable, and accurate data for use in determining travel model inputs. (The annual panel survey will be the subject of a future RFP.)

The tasks identified in the Scope of Services are believed to be the minimum necessary to accomplish this project. Those firms responding should base their proposals on these tasks. Any expansion or alternative methodologies will be accepted, provided they are clearly identified as variations so that a complete evaluation can be made by the Consultant Selection Committee.

SCOPE OF SERVICES

Task 1 - Project Administration

This task provides for development of a detailed Operations Plan and subsequent monitoring of the study's progress (costs, schedules, and milestones). The consultant's proposal should describe how quality control will be maintained throughout the study and how activities will be coordinated with the NCTCOG project manager. NCTCOG staff will be responsible for all media coverage and will seek input from the consultant on the schedule and content of press releases. The proposer should indicate whether a "1-800" telephone number will be provided for the consultant to respond to return calls from households with answering machines and to answer questions about the survey forms, as well as to verify survey authenticity.

Task 2 - Survey Design

The consultant will be responsible for development of integrated Revealed Preference (RP) and Stated Preference (SP) survey designs that will be subject to final approval by the NCTCOG project manager. The consultant should assume that a peer-review panel of two to five travel model/travel survey experts will convene in Arlington, Texas during the mid-point of

this task to discuss the selected consultant's preliminary recommendations for both RP and SP designs. Expenses for the panel participants (other than consultant team members) will be paid directly by NCTCOG and shall not be included in the proposer's budget.

Potential questions for the RP survey are shown in Table 2. In addition to collection of household and person data, a two-day activity diary will be obtained from all household members, including Friday - Saturday and Sunday - Monday sequences. The proposer should address the following RP design issues:

- An appropriate definition of the household that considers how the survey data should be expanded for travel forecasting purposes.
- Mailback versus telephone retrieval of data.
- Use of multilingual forms.
- Preparation of "attractive" forms that will encourage more complete responses.
- Items from Table 2 that are of major or minor interest. Also: additional questions that should be considered.
- The number of RP survey questions that are assumed, for the estimated budget, to be included in each of the five groups: initial recruitment, household variables, personal variables, activity diary questions, and additional probing questions on diary data.
- Staging or ordering of questions.
- The total number of households that are assumed to be "completed" for the estimated budget (the proposer should define "completed").

The consultant will be responsible for the design and development of the SP instruments. For budgeting purposes, the proposer should assume that three topics will be probed: congestion/road pricing; impacts of road congestion; and bicycle and pedestrian improvements. Each topic should be assumed to require 300 responses. The proposer should address the following SP design issues:

- Timing of re-contacts for the SP survey.
- General strategy for SP survey design (e.g., will focus groups be used to define questions).

TABLE 2

Potential Questions for Revealed Preference Surveys

Initial Recruitment or "Screening" Questions

- Household size
- Vehicles available
- Number of children under five (if needed for pilot tests in Task 4)
- Current residence address (for confirmation and mailing out of diaries)
- Number of telephone lines
- Number of shared telephone lines
- Number of people out or number of visitors expected on assigned travel days
- Language spoken in the home
- If language other than English, how well English is spoken

Household Variables

- Household size
- Vehicles available
- Vehicle Characteristics (ownership, make, model, year, and beginning/ending odometer reading on each travel day)
- Number of children under five (if needed for pilot tests in Task 4)
- Dwelling/structure unit type
- Owner/renter
- Length of residence
- Current residence address
- Previous residence address
- Number of phone lines
- Number of shared phone lines
- Number of people out or number of visitors expected on travel days
- Domestic help (babysitter, maid, etc.) that is present most of each weekday
- Household income
- Language spoken in the home
- If language other than English, how well English is spoken

Personal Variables

- Personal income (not household)
- Name and relationship to head of household
- Gender
- Age
- Ethnicity
- Driver's license status
- Employment status (with multi-response to report student and worker, or dual/triple jobs)
- Occupation (pre-coded)
- Industry (pre-coded)

TABLE 2 (Continued)
Potential Questions for Revealed Preference Surveys

Personal Variables (Continued)

- Work/school schedule
- Shift work/flex time available
- School status (multi-response)
- Primary and secondary work/school address
- Parking costs at primary employment
- Subsidized parking/transit pass
- Mode to work or school each day last week
- Disability
- Duration of primary employment
- Previous employment address

Activity Diary Questions (Includes probing by the interviewer)

- Time starting the activity
- The nature of the activity (open-ended answers, for subsequent coding to categories)
- Where was the activity done?
- Was this the same place as the last activity? (if yes, some questions are skipped)
- How did the person get to this activity (mode of travel)?
- If a personal vehicle was used:
  - How many people from your household traveled with you?
  - How many people NOT from your household traveled with you?
  - Which household vehicle was used?
  - How was the vehicle parked?
  - How much was paid for parking?
  - Was parking cost subsidized/paid for by employer/store/shopping center/etc.?
  - Was a transfer to a transit or other vehicle made after parking?
- If public transit was used:
  - Could a household vehicle have been used instead?
  - What bus route was (routes were) used?
  - Where was the bus boarded?
  - Were any transfers made?
    - o Where were the transfers made?
    - o Between what routes were transfers made?
- If walk, bicycle, school bus, or other mode was used:
  - Could a household vehicle have been used instead?
- How long did the travel take to get from the last activity to this one?
- At what time did the activity end?
- Did you do anything else today? (if yes, return to first question)

TABLE 2 (Continued)

Potential Questions for Revealed Preference Surveys

Additional Probing Questions on Activities (for interview only)

Questions for certain types of activities:

- Which household members participated in this activity?
- How often is this activity done (per day, per week, per month, per year)?
- How often is this activity done at this location?
- When was the last time, before this, that you did this activity at this location?
- If the activity was done away from home, could it have been done in the home; if it was done in the home, could it have been done away from home?
- Who decided that you should undertake this activity (the individual, someone else in the household, the individual with others in the household)?

If a personal vehicle was used:

- If people who traveled with you are not from your household:
  - o Is this an organized carpool?
  - o How many times per week do you travel in it?
  - o If parking is paid for, who pays?
- If people who travel with you are from your household:
  - o Who traveled with you?
  - o Was anyone dropped off on the way to this activity?
- Where was the vehicle parked?

If transit was used (include personal vehicle transfer to transit):

- How was the fare paid (regular fare, pass, etc.)?
- How much was paid for this ride or for the pass, transfer, etc.?
- How did you get to the bus?
- How far was it from the last activity location to the bus stop?
- How long did you wait for the bus?
- Where did you get off the bus?
- How did you get from the bus to the activity location?
- How far was it from the stop where you got off the bus to the activity location?
- If transfers were made:
  - o How long did you wait for the bus at each transfer?
  - o Did you have to walk from the stop you got off the bus to the stop where you boarded the next bus?

If bicycle was used:

- Did you use any bicycle paths or bicycle lanes?
- How did you store your bicycle at the activity location?

If walk was used:

- How far did you walk?

Task 3 - RP Sampling Design and Generation of Samples

The consultant will prepare stratified random samples of households, based on two variables:

1. By household size, and
2. By auto ownership or household income.

For mode choice analysis, some enrichment will be done by neighborhood typology. This is necessary to include adequate samples for areas that are more transit oriented, served by park-and-ride lots, friendly to walk and bicycle, or likely to be favorable to carpooling.

The proposer should address the following sampling issues:

- Use of random-digit dialing (RDD) methods for obtaining listed and unlisted telephone numbers.
- How to account for non-telephone households or over-sampling of households with multiple phone lines.
- How to fill stratification "cells" that may be difficult to fill (e.g., use of intercept surveys).

Task 4 - Pilot Testing and Final Survey Design

The consultant will be responsible for conducting and evaluating pilot tests for both RP and SP surveys, followed by final survey design. The pilot tests will be used to examine the quality of all survey instruments, check participation rates, and familiarize the interviewers with procedures. The proposal should identify the approximate number of samples that are assumed to be included for RP and SP evaluation, as well as any other testing procedures (e.g., focus groups). The proposer should comment on the following options under consideration for pilot testing of the RP survey:

- Household and personal income requested either by income range or as a specific figure.

- Financial and other Incentives to improve the response rate, e.g.:
  - A $1 per diary incentive sent with the original diaries (i.e., unconditional)
  - A $10 per household incentive sent with the original diaries (i.e., unconditional)
  - A $2 per diary incentive sent only to households that return completed diaries (i.e., conditional)

- Retrospective reporting of mode to work or school.

- Diaries for all household members versus diaries only for members over four years of age.

- Mailback versus telephone retrieval of survey responses.

The consultant should assume that the peer-review panel identified in Task 2 will reconvene in Arlington, Texas to provide comments on the pilot test results. The consultant should also assume that the final design of the RP survey should allow for both the SP follow-up survey and the potential recruitment of households to a panel.

Task 5 - Conduct Revealed Preference (RP) Survey

The consultant will be responsible for conducting the Revealed Preference (RP) survey. The proposal should identify the procedures that have been assumed for the estimated budget, including work to be done by NCTCOG staff. The proposer should, in particular, address the following:

- Whether initial household recruitment should be by telephone or by introductory letter.

- Whether a single individual in the household should be assigned the responsibility to remind other household members and act as a contact for the survey.

- Whether or not to leave a message on an answering machine. Also: availability of a "1-800" telephone number to answer questions about the survey forms, as well as to verify survey authenticity.

- Procedures for "quick checks" of the data to determine if any information is missing/unclear and warrants that the household be called back for clarification.

- At what point a household will be replaced or replicated.

Task 6 - RP Survey Data Coding and Correction

The consultant will be responsible for editing, coding, and correcting all RP data. Quality control procedures for this task should be identified in the proposal. If corrections are not possible for an individual sample, that sample will be discarded and replaced by the consultant.

Geocoding of addresses (by latitude/longitude whenever possible, otherwise by traffic survey zone) will be performed by NCTCOG through the use of Arc/Info and enhanced 1992 Tiger files. The consultant will be responsible for the completeness and accuracy of the coded addresses, and is encouraged to use multiple categories for the coding of address types (e.g., exact address, place name, and nearest intersection). NCTCOG will have a database available prior to the first survey day containing business names and addresses.

Task 7 - Conduct Stated Preference (SP) Survey

The consultant will be responsible for conducting the Stated Preference (SP) survey. The proposal should identify the procedures that have been assumed for the estimated budget, including work to be done by NCTCOG staff. The consultant should assume, for budgeting purposes, that three SP issues will be investigated for a total of 900 responses.

Task 8 - SP Survey Data Coding and Correction

The consultant will be responsible for editing, coding, and correcting all SP data. Quality control procedures for this task should be identified in the proposal. If corrections are not possible for an individual sample, that sample will be discarded and replaced by the consultant.

Task 9 - Data Processing and Analysis

The consultant will be responsible for the preparation of summaries that document the quality of all survey data, both during and after the data collection tasks. During data collection, the consultant will be expected to prepare statistical summaries on at least a weekly basis of participation rates, average trip rates, and standard trip rate deviations as a way to monitor the quality of the surveys. The proposal should also identify how household non-response and item non-response will be addressed. The consultant will not be responsible for calculation of final trip rates or trip distributions, but will assist in the determination of appropriate sample weighting factors.

Task 10 - Survey Documentation and Reporting

Ten (10) draft copies of the household survey report should be provided to NCTCOG within one month of the last survey. Following acceptance of the final report, fifty (50) reports must be prepared and delivered to NCTCOG with all corrections and comments incorporated in the final version. Final reports should be neatly bound with attractive covers. The report should contain tables, charts and/or graphs wherever applicable to improve clarity. The final document should address the following:

- Executive Summary
- Sampling Procedures and Results
- Survey Training Procedures and Pilot Survey Results
- Final Survey Design and Survey Instruments
- Survey Implementation, Timetable, and Quality Control
- Survey Results and Analysis, Including Non-Responses

Federal and state financial assistance must be acknowledged in the front of the report in the following format:

> Prepared in cooperation with the Texas Department of Transportation and the United States Department of Transportation, Federal Highway Administration and Federal Transit Administration.
>
> The contents of this report reflect the views of the authors who are responsible for the opinions, findings, and conclusions presented herein. The contents do not necessarily reflect the views or policies of the Federal Highway Administration, the Federal Transit Administration, or the Texas Department of Transportation.

In addition to the 50 copies, the final report will also be delivered as a reproducible copy and on a microcomputer floppy disk. Completed household survey forms (both those returned by mail and those created during the interview process), computer data files, maps, and reports purchased for this project shall become the property of NCTCOG. The forms shall be sorted by ID Number before they are turned over to NCTCOG.

SCHEDULE AND BUDGET

The proposer will develop a schedule of tasks, with completion deadlines for each task. The consultant's schedule should assume a Notice to Proceed on September 6, 1994 and an overall time frame of eleven months (September 1994 to August 1995). Pilot surveys and final survey design should be completed in the fall of 1994, with the actual surveys performed in the spring of 1995 (starting in late January). If major adjustments to this preferred schedule are recommended, the proposer must clearly identify the reasons so that a complete evaluation can be made by the Consultant Selection Committee. The consultant will be responsible for correcting any errors found in the data for a period of up to two months following the completion of the last survey.

The funds available for all travel survey-related consultant projects in the Dallas-Fort Worth area are approximately $1.8 million for calendar years 1994 and 1995. The funds to be allocated to the household survey will depend on the actual work to be accomplished. Proposers should base their scope of services and schedule on a budget of **$750,000 to $850,000**. To assist the Consultant Selection Committee in their evaluations, the proposal must identify total costs and manhours for each project task.

CONSULTANT SELECTION CRITERIA

The Consultant Selection Committee will review all proposals and select a firm it considers qualified to undertake the project. The following criteria will be used to evaluate the proposals:

1.	Project Understanding	25 percent
2.	Scope of Services	25 percent
3.	Project Managers/Staff Qualifications	20 percent
4.	Project Cost	15 percent
5.	Firm Qualifications/Consultant References	10 percent
6.	Study Schedule	5 percent

Other requirements are that the Disadvantaged Business Enterprise participation meets NCTCOG's 13 percent goal and that an Affirmative Action Plan is included in the proposal.

Consultants should anticipate that an interview or interviews at NCTCOG's offices in Arlington, Texas may be required before a final consultant selection is made. Interviews of each consultant team will generally last no more than 90 minutes (with no slides, presentation boards, handouts, or other graphics allowed) and be scheduled during the week of July 25, 1994 or August 1, 1994. Costs for developing the proposal and costs attributed to interviews (and subsequent negotiations) are at the proposer's own expense and will not be reimbursed by NCTCOG.

Following final negotiations of the work plan and costs satisfactory to NCTCOG, the consultant will be asked to execute a contract with NCTCOG. A Notice to Proceed will be issued upon execution of the contract by the NCTCOG Executive Board and approval by TxDOT and the Federal Highway Administration. NCTCOG reserves the right to reject any and all proposals,

to contract for any or all portions of the project with the selected consultant(s), or to call in additional firms.

The successful responder(s) to this RFP must understand that they are expected to provide qualified personnel to accomplish each portion of the work in this study. NCTCOG will maintain the right to request the removal of any personnel found, in their opinion, during the course of work on this project, to be unqualified to perform the work.

APPENDIX A

Travel Demand Forecasting Process for the Dallas-Fort Worth Metropolitan Area

April 1994

North Central Texas Council of Governments
616 Six Flags Drive
Arlington, Texas 76011
(817) 640-3300

Introduction

The Dallas-Fort Worth Regional Travel Model (DFWRTM) is used to prepare long-range vehicle and transit-ridership forecasts for a 3,200 square-mile metropolitan area with a population of over three million people. The four-step model is similar to the Urban Transportation Planning System (UTPS) software package, and is primarily used for long-range multimodal planning and performance evaluations. Recent updates have been based on the results of the 1984 home interview, workplace, and transit on-board surveys, as well as the 1980 U.S. Census Journey-to-Work data. Future updates will be guided by ISTEA (Intermodal Surface Transportation Efficiency Act) and EPA (Environmental Protection Agency) requirements and based on 1990 Census findings, new 1994 travel surveys, and ongoing highway and transit counts.

Activity Allocation

With the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, and the Clean Air Act Amendments (CAAA) of 1990, increasing demand has been focused on the linkages between travel demand and land-use forecasting within regional planning bodies. In its current land-use modeling practice, NCTCOG links its four-step travel-demand forecasting model, in a sequential manner, with the Interactive Land Use Transportation Package (ITLUP or DRAM/EMPAL). This model is currently the only land-use modeling package in widespread use in the U.S. that explicitly models land use-transportation interactions.

Demographic and land-use forecasts are made for the 16-county North Central Texas region of 13,000 square miles and 4.1 million people. NCTCOG uses a three-step land-use forecasting process using DRAM/EMPAL as the key modeling component at the district level. A combination of highway and transit travel times are used in this process. A small-area allocation process has been developed to allocate district totals to traffic-survey zones (TSZ) using land-use plans and other local input. Steps used in the 1987 and 1993 demographic forecasting activities are summarized below:

1. Develop regional control totals of employment (five land-use types) and households (four income groups) that are based on estimates from national models.

2. Use EMPAL (Employment Allocation Model) and DRAM (Disaggregated Residential Allocation Model) to allocate control totals to districts in five-year increments, based on relative attraction factors such as district-to-district peak-period travel times and proximity to existing population and employment.

3. Within each district, allocate employment and households to traffic-survey zones after accounting for local factors such as availability of developable land, policy and zoning constraints, and local government review.

There are limits to this technology, however, considering that these models were developed over two decades ago and have not benefitted from substantial redesign during the intervening time. Most applications of the DRAM/EMPAL models do not, in the manner they are applied, adequately represent the nature of land use-transportation interactions. Often this failure is the result of logistical difficulties and time constraints that arise because of the need to run the entire travel-demand modeling system multiple times for each forecast horizon year in order to attempt to achieve a convergence between land use and congestion patterns. Other problems pertain to the absence of specific convergence criteria, and the inherent limitations of a sequential modeling approach to achieve such convergence.

Zone and Network Preparation

The underlying principle around which NCTCOG's forecasting model is built is a system of detailed data sets called the Transportation Information System (TIS). These data sets contain over 6,000 TSZs, 20,000 roadway link segments, and 14,000 network nodes. NCTCOG has developed a "focusing" technique by means of which the activity of the entire Dallas-Fort Worth region can be handled in a manageable and efficient manner. The technique benefits from a five-tier hierarchy of zones maintained for modeling activities. The smallest unit of this zonal system is the TSZ. Each level of hierarchy contains the full level of regional demographic data.

The regional model consists of the aggregation of the 6,000 TSZs into 800 analysis zones, with the zones defined so that each one contains approximately the same level of trip activity in the forecast year. A subarea model may also contain up to 800 zones, but with a zone structure that increases in size as one gets away from the area of interest.

To prevent unusual highway-loading problems, the link level must be matched with the zone level whenever possible. Special software has been developed to automate the process of generating a balanced network and zone structure.

Trip Generation

The cross-classification trip-generation model calculates weekday person-trip productions and attractions for each of the 6,000 TSZs that make up the metropolitan area. Seven trip purposes are used:

- Home-Based Work -- Low Income (HBW1 = Income Quartile 1)
- Home-Based Work -- Low-Median Income (HBW2 = Income Quartile 2)

- Home-Based Work -- High-Median Income (HBW3 = Income Quartile 3)
- Home-Based Work -- High Income (HBW4 = Income Quartile 4)
- Home-Based Nonwork (HBNW)
- Non-Home-Based (NHB)
- OTHER (truck, taxi, internal-external, external-internal, and external-external)

The HBW, HBNW, and NHB trip purposes are initially stratified by income quartiles for use in the trip-production model. The two nonwork trip purposes are then aggregated up to the original categories of HBNW and NHB. The four income categories for HBW trips are maintained so that the trip-distribution model can match the household incomes of residences with the household incomes of employees working at specific locations. This is an attempt to alleviate the well-known "white-collar/blue-collar" problem which is a characteristic of most gravity models. This issue is discussed in detail in the Trip-Distribution section.

Input data for each TSZ includes total area, households, population, and employment, with employment grouped according to Standard Industrial Classification code (SIC) into basic, retail, and service categories. Each TSZ record also identifies average socioeconomic characteristics (e.g., household income, household size, employment income, and area type) for the larger-sized Regional Analysis Area (RAA) that encloses TSZs (each RAA generally contains nine to ten TSZs).

TRIP PRODUCTIONS

The RAA averages for household income, household size, and area type are used to identify the trip production rates in Tables 1 and 2 to apply to a TSZ. Distribution of households by income and household size, and the derivation of area types are described below:

- **Income** — Each zone's households are distributed among the four income quartiles according to a set of curves developed from the 1980 Census data; the ratio of RAA income divided by regional income is the independent variable that is used to predict the fraction of households that fall in each income quartile.
- **Household Size** — In a manner similar to income distribution, the RAA's average household size is the independent variable that is used to predict the fraction of households in a zone that fall in each household size category.

Area Type — An activity density based on the combined population and employment density of an RAA is calculated, with employment factored by the regional population/employment ratio; five area types are used:

1 = Central Business District (Density > 125 per acre)
2 = Outer Business District (Density = 30-125 per acre)
3 = Urban Residential (Density = 7.5-30 per acre)
4 = Suburban Residential (Density = 1.8-7.5 per acre)
5 = Rural (Density < 1.8 per acre)

TRIP ATTRACTIONS

The RAA averages for employment, income, and area type are used to identify the trip attraction rates in Table 3 to apply to a TSZ. The percent of each zone's employment that falls within a particular income quartile is calculated from regression equations that account for the proximity of the zone to households of each income quartile. The underlying assumption is that people live relatively close to the place they work, and low-income neighborhoods are more likely to have low-income jobs than high-income jobs.

SPECIAL GENERATORS AND EXTERNAL STATIONS

The 1984 workplace survey identified six special generator categories:

1. Regional shopping malls (15 locations)
2. Universities and colleges (ten locations)
3. Hospitals (six locations)
4. Commercial airports (three locations)
5. Regional recreation facilities (one location)
6. Military installations (two locations)

To handle special generators, the trip-generation model first applies the trip-attraction rates from Table 3 to the employment from these generators; the analyst must then directly input any additional trips associated with special generators to each trip purpose.

External station data are also added by the analyst to the "OTHER" trip purpose category. The projected station volumes take into account trends both within and external to the metropolitan area.

TABLE 1

TRIP PRODUCTION RATES BY HOUSEHOLD SIZE AND INCOME QUARTILE

TRIP PURPOSE	HOUSEHOLD SIZE					
	1	2	3	4	5	6+
Home-Based Work Trip Productions (Person Trips per Household)						
Income Quartile 1 (low)	1	1.7	1.8	1.846	2.5	2.875
Income Quartile 2	1.204	1.97	2.423	2.864	2.667	3.3
Income Quartile 3	1.552	2.267	2.812	2.824	3.696	3.846
Income Quartile 4 (high)	1.6	2.8	2.848	3.198	3.439	5.286
Home-Based Nonwork Trip Productions (Person Trips per Household)						
Income Quartile 1 (low)	2.185	3.167	3.524	4.5	4.833	6.875
Income Quartile 2	1.62	2.791	4.028	5.682	8	7.7
Income Quartile 3	1.724	2.74	4.205	6.5	8.478	8.385
Income Quartile 4 (high)	2.455	3.145	4.527	6.84	8.927	14.143
Non-Home-Based Trip Productions (Person Trips per Household)						
Income Quartile 1 (low)	1.3	1.6	1.714	2	1.5	0.75
Income Quartile 2	1.611	1.657	2.014	2.5	2.208	1.8
Income Quartile 3	1.69	2.093	2.188	2.989	3.522	2.077
Income Quartile 4 (high)	3.364	3.275	2.866	2.821	3.463	3.357

TABLE 2

TRIP PRODUCTION RATES BY AREA TYPE

TRIP PURPOSE	AREA TYPE				
	1	2	3	4	5
Other Person Trip Productions					
Per Basic Employee	0.264	0.298	0.395	0.488	1.007
Per Retail Employee	0.395	0.632	0.791	0.969	1.318
Per Service Employee	0.264	0.290	0.380	0.527	0.796
Per Household	0.375	0.375	0.375	0.375	0.375

TRIP BALANCING

The trip-generation model goes through a final routine in which trip productions and attractions are balanced by trip purpose:

- **HBW trips** — total person-trip productions within each income quartile are factored so that they equal total person-trip attractions within each income quartile.
- **HBNW and OTHER trips** — total person-trip attractions are factored so that they equal total person-trip productions.
- **NHB trips** — total person-trip attractions are first factored so that they equal total person-trip productions; the original person-trip productions in each zone are then discarded and reset to equal the zone's NHB attractions.

The traditional approach of balancing trip attractions to productions was initially tested for all trip purposes. However, balancing work trip productions to attractions yielded better results. This conclusion was supported by the fact that the attraction rates were developed based on the Work-Place Survey, which has proved to be a more reliable source for the generation of attraction rates than the household surveys.

TABLE 3

TRIP ATTRACTION RATES BY AREA TYPE

TRIP PURPOSE	AREA TYPE				
	1	2	3	4	5
Home-Based Work Trip Attractions (Person Trips per Basic Employee)					
Income Quartile 1 (low)	1.677	1.384	1.413	1.312	1.389
Income Quartile 2	1.695	1.454	1.300	1.277	1.464
Income Quartile 3	1.545	1.421	1.300	1.260	1.530
Income Quartile 4 (high)	1.378	1.296	1.300	1.388	1.521
Home-Based Work Trip Attractions (Person Trips per Retail Employee)					
Income Quartile 1 (low)	1.500	1.486	1.643	1.400	1.455
Income Quartile 2	1.500	1.363	1.400	1.400	1.400
Income Quartile 3	1.467	1.435	1.736	1.634	1.400
Income Quartile 4 (high)	1.500	1.300	1.344	1.358	1.286
Home-Based Work Trip Attractions (Person Trips per Service Employee)					
Income Quartile 1 (low)	1.732	1.296	1.424	1.402	1.422
Income Quartile 2	1.700	1.322	1.430	1.295	1.338
Income Quartile 3	1.700	1.341	1.365	1.456	1.566
Income Quartile 4 (high)	1.704	1.258	1.265	1.323	1.244
Home-Based Nonwork Person Trip Attractions					
Per Basic Employee	0.453	0.442	0.300	0.200	0.139
Per Retail Employee	0.811	1.144	8.796	8.060	6.164
Per Service Employee	1.574	1.005	1..000	1.059	1.812
Per Household	0.442	0.500	0.511	0.627	0.682
Nonhome-Based Person Trip Attractions					
Per Basic Employee	0.500	0.655	0.858	0.589	0.500
Per Retail Employee	1.100	1.462	4.272	3.717	2.978
Per Service Employee	0.600	0.877	1.167	1.243	1.095
Per Household	0.100	0.104	0.216	0.261	0.235
Other Person Trip Attractions					
Per Basic Employee	0.208	0.235	0.312	0.385	0.795
Per Retail Employee	0.312	0.499	0.624	0.765	1.040
Per Service Employee	0.208	0.229	0.300	0.416	0.628
Per Household	0.299	0.299	0.299	0.299	0.299

1984 SURVEYS

Trip-production and attraction rates were derived from the 1984 Household and Work-Place Surveys, respectively. The Household Survey was initially conducted as a home-interview survey. However, due to a number of constraints, the procedure changed to telephone surveys towards the end. The Work-Place Survey proved to be especially helpful in the derivation of more meaningful attraction rates compared to the traditional method of deriving attraction rates from the household surveys.

Like many other survey efforts, the 1984 regional surveys were not without shortcomings. The following list highlights major deficiencies:

- Due to a high rate of household refusal and high turn-around of interviewing personnel, the household survey was not completed by Memorial Day (before schools close) as originally designed. It was prolonged through the first half of July. The analysis of the data revealed a statistically significant difference between the pre- and post-Memorial Day production trip rates. Because school-year travel behavior is the pattern of interest for modeling purposes, all post-Memorial Day trip records were discarded (940 out of 2,471 household records)[1]. Final trip-production rates were developed using the pre-Memorial Day records only.
- Lack of arrival counts for 120 surveyed work-place establishments (out of a total of 474) resulted in the exclusion of those records from the work-place survey files used in the calculation of trip-attraction rates. Another problem was what appeared to be partial arrival counts for a number of establishments, especially for those which had more than one building entrance.
- Problems were also encountered with the coded business types of the work-place establishments. In many instances the coded business type was different from the SIC-based business-type definition, resulting in the misallocation of trip rates. Survey records had to be retrieved for their 4-digit SIC codes so that business types could be reassigned.
- Discrepancies in the definition of the "trip purpose" between the household and work-place surveys resulted in the nonagreement of the production and attraction trip rates for certain cells.

[1] Schools in the Dallas-Fort Worth Metropolitan Area end their normal sessions at the Memorial Day weekend.

Trip Distribution

The trip-distribution gravity model uses a second-order Bessel function as the decay curve to estimate the number of person trips between each pair of zones for each of the seven trip purposes. The performance of the Bessel curve was compared to the more conventional "negative exponential" function. The Bessel Curve demonstrated a better ability to simulate short trips.

Calibration of the Bessel parameter was based on observed data from the 1980 Journey-to-Work, as well as the 1984 household and work-place surveys. The value of the Bessel parameter changes with the trip purpose. For all trip purposes, the gravity model is iterated from 7 to 10 times to ensure that the estimated number of trips received by each zone equals the projected number of trip attractions.

The impedance measure used in the gravity model is the minimum origin-to-destination travel time, including "terminal times." Terminal times account for the time spent locating a parking space, paying for parking, and walking to and from the final destination. They vary by area type and trip end (production versus attraction), and were derived from the 1984 work-place survey. Peak-period travel times are used for distributing the four HBW trip purposes. Off-peak times are used for nonwork purposes. Impedance measures based on "generalized costs" were also tested in the calibration process, but yielded inferior results compared to pure travel times. Prior to the 1987 model update, NCTCOG used generalized-cost measures based on travel time, distance, costs, and the number of links traversed.

Minimum-time paths are built using estimated loaded speeds (ELS). Free-flow speeds are reduced by ELS factors which were derived from a previous study. Estimated loaded-speed factors vary by time-of-day (peak versus off-peak), functional classification, number of lanes, location of the roadway in the region, and the forecast year. The calibration of the model has been based on one feedback loop, recycling the congested speeds of the loaded network back into the distribution model, and subsequently into the mode-choice and assignment models.

INCOME STRATIFICATION OF WORK TRIPS

Trip-distribution models are usually diagnosed with the classical "white-collar/blue-collar" problem. The symptoms of this problem are the attraction of too many CBD workers from the low-income, inner-city neighborhoods, and too few from the distant, higher-income residential areas. The recommended solution for this problem is the stratification of the HBW attraction and distribution models by income categories. NCTCOG's trip-distribution model is one of the few in the United States with this feature. Although the model still tends to send too many low-income and too few high-income work trips to the CBD, it is safe to assume that the magnitude of this income-related problem is significantly reduced as a result of the stratification of the work model by income quartiles.

Detailed analysis of results, performed as part of the South Oak Cliff Alternatives Analysis Project in 1990, suggests a good agreement between the estimated and observed income distribution of workers in the CBD. There also seems to be a good match between the observed and estimated average trip length to the CBD. Thus, the model correctly estimates the number of workers in each income quartile who commute to the CBD, as well as their average trip lengths. The error seems to be in the model's ability to estimate where these workers come from (a mismatch in the linkage between their residence and work-place locations), and not necessarily associated with income and/or accessibility.

The introduction of "K factors" in the gravity model is a conventional approach to solving such problems. They can be used to increase the number of trips for the underestimated zone-to-zone trip interchanges, and decrease those that were previously overestimated. The 1990 Journey-to-Work data and the upcoming surveys will be valuable sources of observed data that can be used for this purpose. A robust model, however, should have a limited need for K factors and be able to provide the full explanatory power without recourse to such adjustments.

AIRPORT TRIPS

Another area where the current distribution model can be improved further is with respect to trips sent to the Dallas/Fort Worth Airport. A comparison between the modeled trip lengths to the airport and the observed data from the 1984 airport nonemployee survey suggests that the simulated trip lengths are approximately 30% less than the observed data for both the HBNW and NHB purposes. With the aid of the recent Airport survey conducted by NCTCOG, the upcoming surveys, and perhaps a separate distribution of airport trips, further improvements in this area can be achieved.

Mode Choice

The Mode-Choice Model, calibrated based on the 1984 household and on-board transit survey data, is a simple multinomial logit model providing various choice sets for three trip purposes. The HBW model has the most detailed specifications of all three models. It presents three levels of occupancy submodels to facilitate the analysis of alternative occupancy requirements for HOV lanes. Similarly, transit is presented by mode of access (auto versus walk) in order to capture the trade-offs between the two access modes, and to provide a clearer analysis of required passenger facilities at stations. The five choice sets for the HBW model are:

- HBW — Five modes: drive alone, 2 occupant shared ride, 3+ occupant shared ride, walk access to transit, and auto access to transit.

The HBNW model has a structure similar to that of the HBW model, but aggregates the ridesharing options into one alternative. The assumption behind this aggregation is that work trips constitute the major market for the HOV facilities, and that few nonwork travelers will choose an occupancy level based on the presence of HOV lanes. Transit is presented by both walk and auto modes of access, based on the 1984 on-board survey data that indicated a substantial number of auto-access HBNW transit trips. The choice sets for the HBNW model are

- HBNW — Four modes: drive alone, 2+ occupant shared ride, walk access to transit, and auto access to transit.

Due to a limited number of NHB trips in the 1984 on-board survey, the NHB model was initially developed with the simplest structure, aggregating ride-sharing and transit-access alternatives. The three choice sets in this model are:

- NHB — Three modes: drive alone, 2+ occupant shared ride, and transit.

This model was recently modified as part of the North Central Corridor Alternatives Analysis project. Originally, mode of access was not a part of the NHB transit submodel. However, because NCTCOG assigns transit trips by time-of-day and mode of access, NHB trips had to be split into walk- and auto-accessed trips for loading onto the off-peak network. In the absence of a choice-based technique, the split was done based on access time as the measure of attractiveness. Because driving is typically faster than walking, in most cases auto-access links were preferred over walk links, resulting in an unusually high number of auto-access trips.

Introduction of transit by mode of access as a "choice" in the formulation of the model solved this particular shortcoming. The four choices of drive alone, shared ride, transit/walk access, and transit/auto access are thus represented in the revised structure of the NHB model:

- Revised NHB — Four modes: drive alone, 2+ occupant shared ride, walk access to transit, and auto access to transit.

Tables 4, 5, 6 and 7 present model coefficients and constants used for each trip purpose. Impedances for HBW trips are based on peak periods, while impedances for HBNW and NHB trips are based on off-peak periods. The models are composed of level-of-service variables defining the characteristics of the transportation system (time and costs), as well as socioeconomic variables on the characteristics of the travelers (with the exception of the NHB model).

Locational boolean variables for Dallas and Fort Worth CBDs are also used in all three models in an attempt to capture the unmeasurable effects of traveling to the CBDs not explained effectively by the level-of-service variables alone (such as the radial design of the transit system). The relatively large size of these variables in the HBW model may be indicative of the model's potential need for some omitted variables. Although an "employment density" variable was initially included in the HBW model, it turned out to be statistically insignificant.

MODEL CALIBRATION

The calibration data set used in the estimation of the model was based on 1984 household and on-board transit survey data, which, together, provided more than 9,000 valid and complete observations on auto and transit trips made in the Dallas-Fort Worth area. The highway and transit networks provided the necessary information on travel time and costs between zone pairs. Since the number of observations exceeded that necessary for model calibration, a quota-based random sample of data was drawn for calibration purposes.

The mainframe computer software QUAIL was used in the estimation of model coefficients. The calibration effort involved the estimation of approximately 100 different model specifications. Several criteria for the acceptance or rejection of a given model specification were developed. The calibration process also went through the scrutiny of a peer review process. A panel of national experts in mode-choice modeling, composed of both academicians and practitioners, met three times throughout the course of the project and provided guidance and input regarding a number of model-related issues.

TABLE 4
HOME-BASED WORK MODE-CHOICE MODEL
COEFFICIENTS AND CONSTANTS

VARIABLE DESCRIPTION	Drive Alone	Shared Ride (2 Person)	Shared Ride (3+ Person)	Transit/ Walk	Transit/ Drive
IVT = In-Vehicle Travel Time, Excluding Drive Time to Transit, minutes	-0.029670	-0.029670	-0.029670	-0.029670	-0.029670
TERMINAL = Time at Both Ends of a Trip, minutes	-0.055240	-0.055240	-0.055240	0.000000	0.000000
ACCESS/EGRESS = Time to Transit, Including Drive Access Time, minutes	0.000000	0.000000	0.000000	-0.055240	-0.055240
RUNCOST = Total Tolls, Bus Fares, Park-&-Ride Fees, and Auto Running Costs, cents	-0.004649	-0.004649	-0.004649	-0.004649	-0.004649
PARKCOST = Posted Parking Cost, cents	-0.011623	-0.011623	-0.011623	0.000000	0.000000
AUTOS/PERSON = Number of Autos per Person in the Household	0.000000	-1.256000	-1.256000	-0.721800	0.000000
AUTOS/HOUSEHOLD = Numbers of Autos in the Household	0.000000	0.000000	0.000000	-0.866000	-0.529700
DALLAS CBD FLAG	0.000000	-0.258900	-0.362680	3.516120	3.234250
FT. WORTH CBD FLAG	0.000000	0.491750	0.354340	2.66[illegible]160	1.870840
FWAITLT7 = First Wait Time for Transit, Seven Minutes or Less	0.000000	0.000000	0.000000	-0.054920	-0.054920
FWAITGT7 = First Wait Time for Transit, Excluding the First Seven Minutes	0.000000	0.000000	0.000000	-0.028730	-0.028730
TRANSFER = Transfer Wait Time, minutes	0.000000	0.000000	0.000000	-0.059090	-0.059090
HOV = Time Savings per Mile for Vehicles Using HOV, minutes	0.000000	0.130000	0.130000	0.000000	0.000000
INCOME QUARTILE for the Household (1 = Low, 4 = High)	0.000000	0.000000	0.000000	-0.493400	-0.100000
DETERRENT = Auto Access Time - Transit IVT for NonCBD Zones, minutes	0.000000	0.000000	0.000000	0.000000	-0.660400
CONSTANTS:					
CHOOSERS	0.000000	-0.693560	-1.705190	0.358150	-3.361420
ZERO-CAR HHOLDS	0.000000	-2.073120	-2.261870	3.117990	0.000000
SELF-EMPLOYED	0.000000	-1.024280	-1.491550	0.000000	0.000000

TABLE 5
HOME-BASED NONWORK MODE-CHOICE MODEL
COEFFICIENTS AND CONSTANTS

VARIABLE DESCRIPTION	Drive Alone	Shared Ride (2+ Person)	Transit/ Walk	Transit/ Drive
IVT = In-Vehicle Travel Time, Excluding Drive Time to Transit, minutes	-0.003680	-0.003680	-0.003680	-0.003680
TERMINAL = Time at Both Ends of a Trip, minutes	-0.007360	-0.007360	0.000000	0.000000
ACCESS/EGRESS = Time to Transit, Including Drive Access Time, minutes	0.000000	0.000000	-0.007360	-0.007360
RUNCOST = Total Tolls, Bus Fares, Park-&-Ride Fees, and Auto Running Costs, cents	-0.002300	-0.002300	-0.002300	-0.002300
PARKCOST = Posted Parking Cost, cents	-0.005750	-0.005750	0.000000	0.000000
AUTOS/PERSON = Number of Autos per Person in the Household	0.000000	-0.953600	-0.678000	0.000000
AUTOS/HOUSEHOLD = Numbers of Autos in the Household	0.000000	0.000000	-0.269400	-0.269400
HOUSEHOLD SIZE = Persons per Household	0.000000	0.254200	0.418900	0.482500
DALLAS CBD FLAG	0.000000	-1.838400	1.667260	0.958500
FT. WORTH CBD FLAG	0.000000	-1.020430	1.354110	0.422540
RURAL AREA FLAG	0.000000	0.659200	0.000000	0.000000
WAIT TIME = Wait Time for Transit, minutes	0.000000	0.000000	-0.014720	-0.014720
TRANSFER = Transfer Wait Time, minutes	0.000000	0.000000	-0.014720	-0.014720
INCOME QUARTILE for the Household (1 = Low, 4 = High)	0.000000	0.000000	-0.884500	-0.884500
CONSTANTS:				
CHOOSERS	0.000000	0.375450	-2.234640	-4.881230
ZERO-CAR HHOLDS	0.000000	2.756830	3.496340	0.000000
SELF-EMPLOYED	0.000000	0.459230	0.000000	0.000000

TABLE 6
NON-HOME-BASED MODE-CHOICE MODEL COEFFICIENTS AND CONSTANTS

VARIABLE DESCRIPTION	Drive Alone	Shared Ride (2+ Person)	Transit/ Walk-Auto
IVT = In-Vehicle Travel Time, Excluding Drive Time to Transit, minutes	-0.012160	-0.012160	-0.012160
TERMINAL = Time at Both Ends of a Trip, minutes	-0.024320	-0.024320	0.000000
ACCESS/EGRESS = Time to Transit, Including Drive Access Time, minutes	0.000000	0.000000	-0.024320
RUNCOST = Total Tolls, Bus Fares, Park-&-Ride Fees, and Auto Running Costs, cents	-0.004350	-0.004350	-0.004350
PARKCOST = Posted Parking Cost, cents	-0.007020	-0.007020	0.000000
DALLAS CBD PRODUCTION FLAG	0.000000	-0.971410	1.301880
DALLAS CBD ATTRACTION FLAG	0.000000	-1.835180	0.349430
FT. WORTH PRODUCTION CBD FLAG	0.000000	-0.549750	0.491930
FT. WORTH ATTRACTION CBD FLAG	0.000000	-0.591560	0.920620
WAIT TIME = Wait Time for Transit, minutes	0.000000	0.000000	-0.085120
TRANSFER = Transfer Wait Time, minutes	0.000000	0.000000	-0.085120
DENSITY = Employment Density, employees/acre	0.000000	0.000042	0.000000
CONSTANT	0.000000	-0.285670	-2.242330

IIA AND NESTED LOGIT

A major concern regarding the specifications of logit equations is the violation of the axiom known as the "Independence from Irrelevant Alternatives (IIA)." In a valid multinomial-logit model, alternatives are defined as "distinct alternatives," such that their attributes are not highly correlated with one another. The violation of this principal may be tested in a number of ways. The standard test involves the construction of "restricted" models without the alternatives which might have the likelihood of high correlations. The test is applied to the set of parameters estimated between the restricted and unrestricted models (Hausman-McFadden test). The models failed this test due to the limitations of the calibration software, QUAIL.

TABLE 7
REVISED NON-HOME-BASED MODE-CHOICE MODEL COEFFICIENTS AND CONSTANTS

VARIABLE DESCRIPTION	Drive Alone	Shared Ride (2+ Person)	Transit/ Walk	Transit/ Drive
IVT = In-Vehicle Travel Time, Excluding Drive Time to Transit, minutes	-0.012160	-0.012160	-0.012160	-0.012160
TERMINAL = Time at Both Ends of a Trip, minutes	-0.024320	-0.024320	0.000000	0.000000
ACCESS/EGRESS = Time to Transit, Including Drive Access Time, minutes	0.000000	0.000000	-0.024320	-0.024320
RUNCOST = Total Tolls, Bus Fares, Park-&-Ride Fees, and Auto Running Costs, cents	-0.004350	-0.004350	-0.004350	-0.004350
PARKCOST = Posted Parking Cost, cents	-0.007020	-0.007020	0.000000	0.000000
DALLAS CBD PRODUCTION FLAG	0.000000	-0.962270	1.229310	1.274860
DALLAS CBD ATTRACTION FLAG	0.000000	-1.827210	0.220810	0.712710
FT. WORTH PRODUCTION CBD FLAG	0.000000	-0.543260	0.429530	-1.814240
FT. WORTH ATTRACTION CBD FLAG	0.000000	-0.584790	0.882440	0.394110
WAIT TIME = Wait Time for Transit, minutes	0.000000	0.000000	-0.085120	-0.085120
TRANSFER = Transfer Wait Time, minutes	0.000000	0.000000	-0.085120	-0.085120
DENSITY = Employment Density, employees/acre	0.000000	0.000042	0.000000	0.000000
CONSTANT	0.000000	-0.286940	-2.109200	-3.626670

Furthermore, construction of nested logit models both as a test of, and a solution to the IIA problem was also a failure. Again, software limitations prohibited a meaningful estimation of a nested model. The attempt resulted in nesting coefficients with out-of-range values. In a nested model, nesting coefficients should have a value between zero and one. However, several attempts in the construction of nested logit models with different specifications resulted in unacceptable values of the nesting coefficients (negative values, or values greater than one). Since then, several calibration software packages have become available that can estimate nested logit models successfully (e.g., ALOGIT, LIMDEP).

In summary, all tests regarding the models' violation of the IIA axiom have been inconclusive. The models might or might not be in violation of that principle. However, because transit is treated as a generic mode in all three models, and alternatives are defined in such a way that no

new modes are to be introduced in the future (e.g., HOV lanes falling under the 2 or 3+ occupant ride share), then one can argue that the problems arising from IIA violations are not necessarily major issues.

CAPTIVITY

Various modes of travel identified as alternatives in the three models discussed above are not necessarily available to all individuals. The inability to afford an automobile restricts the traveler to the walk-accessed transit mode or ride-sharing options alone (economic captivity). Individuals whose occupation mandates the use of a car (salesmen, self-employed, and managers with access to the company car) are automobile-captive travelers. Their choices are restricted to driving alone or ride-sharing alternatives (functional captivity).

The reason for a concern with captives resides within the nature of mode-choice models which are based on theories of choice among alternatives. Forcing the model to choose illogical alternatives may bias the coefficients to "explain" such choices. During the calibration process, travelers with limited choice sets were excluded from the calibration database. Only those with full choice sets were used in the estimation of coefficients. The model validation process focused much attention on the ability of the resulting models to predict choices for captive travellers. Separate mode-specific constants were developed for each group.

In application, data derived from the household survey were used to skim off person trips made by individuals with limited choice sets from the total person-trip table. For these two groups, the model estimates mode shares among the alternatives available to the group rather than considering all alternatives. Resulting trips, by mode and choice-set limitations, were validated against observed data.

Validation of the "self-employed and managers" category was relatively effortless. Look-up tables obtained from the 1984 household survey were used in the estimation of person trips which were, in turn, processed for their "relevant mode" shares. Constants were adjusted, and a good match between the estimated results and the observed data was obtained.

Validation of the "zero-car household" category did not go as smoothly as the one mentioned above. Regardless of the number of iterations, the gap between the observed and estimated trips would not come to a close. Several modifications had to be made to the survey-based captivity rates in the look-up table in order to reach convergence on the constants and meet the observed data. The source of the problem in this exercise could not be confidently determined. The problem could have stemmed from the definition of the zero-car household captivity rates, from

the data, or from the application of the data in the model. NCTCOG is one of the few agencies in the U.S. which has recognized the need for separate handling of the transit and automobile captives. Collection of robust data necessary to support this effort should be considered in the next round of travel surveys.

HOV TRIPS

To permit analysis of HOV-lane impacts, the HBW mode-choice model can read two sets of highway impedances. One set represents the highway travel times available to travelers in mixed-flow traffic, while the other represents the reduced travel times available to travelers with occupancies that qualify for the HOV lanes. The model assigns the appropriate travel time to each occupancy alternative and computes mode shares that recognize the impact of HOV time savings.

One important variable used in the HBW model with respect to the HOV demand, is the "HOV reliability" variable, representing the improved reliability of travel time on the HOV lanes (HOV time savings per mile). Without this variable, most mode-choice models tend to underestimate the HOV demand on reserved facilities. Due to the absence of an HOV facility in the Dallas-Fort Worth area at the time of model calibration, a local coefficient could not be estimated for this variable. The current coefficient in the model has been transferred from the Shirley Highway HOV model in suburban Washington, D.C. However, the operation of the I-30 HOV facility in Dallas should now facilitate the estimation of a local coefficient for this important variable.

TRANSIT ACCESS

In the calibration phase of the mode-choice model, all zones were connected to the transit network by means of both walk- and auto-access links regardless of their proximity to the transit network. No restrictions were placed on the length of access links. The idea was to avoid the potential model's insensitivity to walk- and drive-access time to transit by imposing artificial caps on their lengths. Models calibrated with restricted access-link lengths tend to have smaller coefficients for these two variables. In application, transit networks use 2.5 miles for walk-access and egress links, and 15.0 miles for drive-access links to transit. These distances represent the points at which the model's estimated probability of transit use approaches zero.

In 1984, neither the on-board transit survey, nor the household survey contained any information concerning the time or distance for access to a transit stop. Assumptions, look-up tables, and computer programs were used in the "generation" of these data from the two survey files. This information is crucial in the calibration process. It is also used in the determination of the

sampling procedure for the final calibration file. Collection of reliable data on the characteristics of walk and auto access to transit stops should have high priority in the next phase of data collection.

Transit Assignment

Four separate multi-path assignments of weekday transit production-attraction person trips, by trip purpose and peak and off-peak periods, are performed:

- HBW walk-access transit trips loaded onto peak-period walk paths
- HBW drive-access transit trips loaded onto peak-period drive paths
- HBNW and NHB walk-access transit trips loaded onto off-peak period walk paths
- HBNW and NHB drive-access transit trips loaded onto off-peak period drive paths

NCTCOG's transit path-building program employs an unique algorithm to generate multiple transit paths for each zone-to-zone interchange. The best path is the minimum-impedance path, used by both the mode-choice and transit-assignment models. The program is capable of generating up to seven paths for each zone-pair interchange based on the variations of the access and egress modes. The current practice at NCTCOG is to build a total of four paths for each interchange. The collection of the four paths used in the transit assignment procedure guarantees smoother assignment among various lines.

After trip assignment, a time-of-day post-processing technique computes total peak and off-peak volumes on each transit link by reallocating the loadings according to the observed region-wide distribution of transit trips by purpose and access mode.

The distribution of transit trips by time-of-day, purpose, and mode of access, as well as observed ride-check data are used in the validation of transit ridership estimates at the corridor level. Observed park-and-ride and kiss-and-ride data are used in estimation of the breakdown of the park-and-ride and kiss-and-ride demand at park-and-ride lots and rail stations. Observed data on fare payment by type of fare are used in the fare revenue estimation model.

Traffic Assignment

The roadway-assignment model uses a capacity-restrained, incremental procedure to assign origin-destination vehicle trips to the roadway network. The minimum path-building routine uses a generalized cost equation (based on travel time, distance, and cost parameters) for the calculation of link impedance. The initial impedance for assignment purposes is based on free-flow (uncongested) speeds. As traffic is loaded onto the links, the speed is reduced according to a volume-delay relationship and link impedances updated accordingly.

In an attempt to validate loaded roadway volumes to the observed traffic counts, NCTCOG has had to apply a series of K factors to its post-mode choice daily vehicle-trip tables. Similar to the K factors used in a gravity model, these factors increase the number of trips for interchanges where trips are underestimated, and decrease those that are overestimated. The need for these factors is most likely to compensate for the shortcomings of the trip-distribution model. Improvements to the distribution model and use of K factors embedded within the gravity model should alleviate the need for post-mode choice vehicle-trip factors.

WEEKDAY ASSIGNMENT

Traffic assignments are generally performed for a weekday period, because most model validations by NCTCOG are made with weekday counts rather than peak-hour counts. Although an off-peak roadway network is used, the travel-time estimates for the path-building routine are based on delays associated with peak periods. Separate volume-delay equations are used for high- and low-capacity facilities, in which high-capacity facilities (usually freeways) are normally defined as those exceeding 3,400 one-way vehicles per hour.

The weekday volume-delay equation for high-capacity facilities is:

*Delay (minutes/mile) = Minimum [0.015 * EXP(5.30 * (hourly volume/hourly capacity)), 60]*

The weekday volume-delay equation for low-capacity facilities is:

*Delay (minutes/mile) = Minimum [0.05 * EXP(3.00 * (hourly volume/hourly capacity)), 10]*

For the volume-delay equations, weekday link volumes are converted to hourly volumes using factors of 0.10 for freeway facilities and 0.12 for nonfreeway facilities (factors ranging from 0.08

to 0.14 have been used in some subarea studies). Hourly capacities are assumed to represent Level of Service E volumes.

PEAK-HOUR ASSIGNMENT

In addition to using different volume-delay equations and a peak-period roadway network, the peak-hour assignment process requires the use of a peak-hour trip table. Peak-hour distribution factors by time-of-day (morning or afternoon), trip purpose (HBW, HBNW, NHB, and OTHER), and trip orientation (production versus attraction) are applied to the daily production-attraction person-trip tables before the tables are converted to origin-destination vehicle-trip tables. The distribution factors were obtained from the 1984 household survey.

The peak-hour volume-delay equation for high-capacity facilities is:

*Delay (minutes/mile) = Minimum [0.015 * EXP(7.00 * (hourly volume/hourly capacity)), 60]*

The peak-hour volume-delay equation for low-capacity facilities is:

*Delay (minutes/mile) = Minimum [0.05 * EXP(4.50 * (hourly volume/hourly capacity)), 10]*

HOV ASSIGNMENT

In the absence of HOV lanes, all vehicle trips are assigned to the mixed-flow lanes, regardless of their occupancy. With HOV lanes, a two-step assignment procedure is employed. First, by means of the all-or-nothing assignment technique, all trips likely to use HOV facilities are loaded onto the network. Peak-period final speeds are used for the mixed-flow network to represent roadway congestion en-route to HOV facilities. Thereafter, maximum allowable speeds are used on HOV lanes. Nonwork trips are not loaded on to the HOV network, because they tend to be off-peak trips with shorter trip lengths. Depending on the minimum-occupancy policy, either 78% of work trips with 2+ occupants, or 84% of work trips with 3+ occupants are assigned onto the HOV network. These figures are obtained from the 1984 household survey, and reflect the peak-period distribution of work trips by occupancy.

Next, the remainder of the vehicle trips is assigned onto the mixed-flow roadway network using the capacity-constraint assignment technique. HOV lanes are removed from the network prior to this exercise. Where applicable, volumes are added to the existing "preloaded" volumes from the HOV-assignment step.

TABLE B-1
SOCIO-ECONOMIC DATA FOR CMSA AND METROPOLITAN AREA

VARIABLE	COUNTY									TOTAL CMSA	% In Metrop. Area
	Collin	Dallas	Denton	Ellis	Johnson	Kaufman	Parker	Rockwall	Tarrant		
Area, Square Miles											
For County	886	909	957	952	734	807	910	149	897	7,200	68.9%
In Metrop. Area	886	909	957	523	355	206	78	149	897	4,960	100.0%
Population											
1990--For County	264,036	1,852,810	273,525	85,167	97,165	52,220	64,785	25,604	1,170,103	3,885,415	97.0%
1990--In Metrop. Area	264,036	1,852,810	273,525	75,418	85,066	12,019	9,666	25,604	1,170,103	3,768,247	100.0%
2010--For County	566,065	2,144,691	478,568	122,411	108,827	62,132	77,340	60,545	1,515,800	5,136,379	97.4%
2010--In Metrop. Area	566,065	2,144,691	478,568	112,446	96,549	14,272	12,069	60,545	1,515,800	5,001,005	100.0%
Population in Households											
1990--For County	262,025	1,827,276	265,796	83,904	95,286	50,947	63,692	25,379	1,150,975	3,825,280	97.0%
1990--In Metrop. Area	262,025	1,827,276	265,796	74,204	83,338	12,019	9,647	25,379	1,150,975	3,710,659	100.0%
2010--For County	563,439	2,110,550	468,933	120,838	106,487	60,545	75,979	59,905	1,491,959	5,058,635	97.4%
2010--In Metrop. Area	563,439	2,110,550	468,933	110,934	94,397	14,272	12,046	59,905	1,491,959	4,926,435	100.0%
Households											
1990--For County	95,805	701,686	101,984	28,588	33,462	17,827	23,048	8,838	438,634	1,449,872	97.2%
1990--In Metrop. Area	95,805	701,686	101,984	25,246	29,289	4,054	3,323	8,838	438,634	1,408,859	100.0%
2010--For County	217,252	868,416	188,407	44,053	39,960	22,635	29,386	22,248	602,259	2,034,616	97.5%
2010--In Metrop. Area	217,252	868,416	188,407	40,409	35,447	5,130	4,460	22,248	602,259	1,984,028	100.0%
Household Size											
1990--For County	2.73	2.60	2.61	2.93	2.85	2.86	2.76	2.87	2.62	2.64	
1990--In Metrop. Area	2.73	2.60	2.61	2.94	2.85	2.96	2.90	2.87	2.62	2.63	
2010--For County	2.59	2.43	2.49	2.74	2.66	2.67	2.59	2.69	2.48	2.49	
2010--In Metrop. Area	2.59	2.43	2.49	2.75	2.66	2.78	2.70	2.69	2.48	2.48	
Employment *											
1990--For County	97,244	1,309,241	66,745	28,009	33,294	20,353	19,360	9,603	565,386	2,149,235	98.1%
1990--In Metrop. Area	97,244	1,309,241	66,745	26,034	29,574	3,338	1,452	9,603	565,386	2,108,617	100.0%
2010--For County	226,084	1,838,216	128,738	33,631	47,525	30,640	28,319	16,077	863,938	3,219,368	98.1%
2010--In Metrop. Area	226,084	1,838,216	128,738	36,934	42,178	5,024	2,049	16,077	863,938	3,159,238	100.0%

* Excludes Construction Employment

TABLE B-2

CENSUS DATA FOR THE DALLAS-FORT WORTH AREA

ITEM	Collin	Dallas	Denton	Ellis	Johnson	Kaufman	Parker	Rockwall	Tarrant	Total CMSA
Total Population										
1970	67,421	1,327,695	75,633	46,638	45,769	32,641	33,888	7,046	715,587	2,352,318
1980	145,255	1,556,385	143,560	59,743	67,649	39,727	44,609	14,528	861,837	2,933,293
1990	264,036	1,852,810	273,525	85,167	97,165	52,220	64,785	25,604	1,170,103	3,885,415
1994	322,800	1,911,200	304,300	88,400	99,350	53,050	64,700	29,150	1,235,200	4,108,150
1980/1970	2.15	1.17	1.90	1.28	1.48	1.22	1.32	2.06	1.20	1.25
1990/1980	1.82	1.19	1.91	1.43	1.44	1.31	1.45	1.76	1.36	1.32
1994/1990	1.22	1.03	1.11	1.04	1.02	1.02	1.00	1.14	1.06	1.06
Distribution of Population by Gender in 1990	264,036	1,852,810	273,525	85,167	97,165	52,220	64,785	25,604	1,170,103	3,885,415
Male	49.7%	49.2%	49.4%	49.3%	49.6%	48.9%	50.0%	49.7%	49.5%	49.4%
Female	50.3%	50.8%	50.6%	50.7%	50.4%	51.1%	50.0%	50.3%	50.5%	50.6%
Population Distribution by Race in 1990										
White	89.1%	67.0%	88.5%	81.1%	93.0%	82.0%	96.1%	93.7%	78.4%	75.3%
Black	4.1%	19.0%	5.0%	10.0%	2.6%	14.0%	0.9%	3.3%	12.0%	14.3%
Other	6.8%	14.0%	6.5%	8.9%	4.4%	4.0%	3.0%	3.0%	9.6%	10.4%
Percent of Population With Hispanic Origin in 1990	6.9%	17.0%	7.0%	13.2%	7.7%	6.4%	4.2%	5.9%	12.0%	13.4%
Distribution of Population by Age in 1990	264,036	1,852,810	273,525	85,167	97,165	52,220	64,785	25,604	1,170,103	3,885,415
Under 5 years	8.5%	8.4%	8.6%	8.4%	7.7%	7.7%	7.4%	7.6%	8.5%	8.4%
Under 12 years	19.7%	18.9%	19.4%	20.9%	19.4%	19.8%	19.0%	19.4%	19.4%	19.2%
Under 18 years	29.0%	26.8%	26.9%	31.0%	29.2%	29.4%	28.0%	29.4%	27.1%	27.3%
65 or more years	5.2%	8.2%	5.0%	10.1%	10.4%	11.9%	11.0%	7.7%	8.3%	8.0%
Average Age in 1990	29.6	32.0	29.6	32.5	33.4	34.1	34.3	32.8	31.9	31.8

Processed by the Transportation Department of the North Central Texas Council of Governments.

TABLE B-2 (Continued)

CENSUS DATA FOR THE DALLAS-FORT WORTH AREA

ITEM	Collin	Dallas	Denton	Ellis	Johnson	Kaufman	Parker	Rockwall	Tarrant	Total CMSA
Persons 5 Years and Over										
in 1990, by Residence in 1985	241,723	1,697,701	250,152	77,963	89,742	48,282	59,994	23,658	1,070,824	3,560,039
In same house as now	40.9%	44.7%	36.1%	54.0%	52.2%	54.5%	51.8%	46.3%	43.3%	44.1%
Diff. house, same county	17.8%	34.6%	19.8%	20.8%	21.6%	18.9%	16.7%	11.9%	31.1%	30.1%
Diff. house, diff. county	23.2%	9.6%	27.2%	19.2%	19.6%	22.1%	25.4%	31.3%	12.5%	13.7%
Diff. state	16.3%	8.5%	15.2%	5.4%	5.9%	3.8%	5.5%	9.6%	11.0%	10.0%
Abroad	1.8%	2.6%	1.7%	0.6%	0.7%	0.8%	0.6%	0.8%	2.0%	2.2%
Persons in Single or Multi-Family Households										
1980	143,140	1,536,668	136,200	58,449	66,555	37,266	43,993	14,426	845,597	2,882,294
1990	262,025	1,827,276	265,796	83,904	95,286	50,947	63,692	25,379	1,150,975	3,825,280
1990/1980	1.83	1.19	1.95	1.44	1.43	1.37	1.45	1.76	1.36	1.33
Number of Households										
1980	46,418	577,939	49,004	19,874	23,183	13,343	15,691	4,887	310,076	1,060,415
1990	95,805	701,686	101,984	28,588	33,462	17,827	23,048	8,838	438,634	1,449,872
1990/1980	2.06	1.21	2.08	1.44	1.44	1.34	1.47	1.81	1.41	1.37
Distribution of Households										
in 1990	95,805	701,686	101,984	28,588	33,462	17,827	23,048	8,838	438,634	1,449,872
Percent family	75.1%	66.0%	68.3%	80.3%	80.2%	78.4%	79.6%	81.9%	69.9%	69.0%
Percent nonfamily	24.9%	34.0%	31.7%	19.7%	19.8%	21.6%	20.4%	18.1%	30.1%	31.0%
Household Size										
1980	3.08	2.66	2.78	2.94	2.87	2.79	2.80	2.95	2.73	2.72
1990	2.73	2.60	2.61	2.93	2.85	2.86	2.76	2.87	2.62	2.64

Processed by the Transportation Department of the North Central Texas Council of Governments.

TABLE B-2 (Continued)
CENSUS DATA FOR THE DALLAS-FORT WORTH AREA

ITEM	Collin	Dallas	Denton	Ellis	Johnson	Kaufman	Parker	Rockwall	Tarrant	Total CMSA
Household Distribution by Persons in Household in 1990										
1 person	20.5%	27.5%	23.7%	17.3%	17.3%	18.8%	17.9%	15.2%	24.5%	25.1%
2 persons	30.0%	29.7%	31.0%	29.5%	31.4%	30.4%	33.0%	32.6%	30.9%	30.3%
3 persons	19.7%	17.0%	18.8%	19.1%	19.7%	18.5%	19.6%	20.3%	18.2%	17.8%
4 persons	19.2%	14.3%	16.9%	19.1%	19.2%	18.5%	18.1%	19.8%	15.8%	15.6%
5 persons	7.4%	6.8%	7.0%	9.4%	8.2%	8.4%	8.4%	8.2%	6.9%	7.0%
6 persons	2.2%	2.7%	1.9%	3.5%	2.6%	3.3%	2.2%	2.4%	2.2%	2.4%
7 or more persons	1.0%	2.1%	0.7%	2.0%	1.6%	2.0%	0.8%	1.5%	1.5%	1.7%
Cumlative Distribution of Households in 1990, by Size										
1 person/household	20.5%	27.5%	23.7%	17.3%	17.3%	18.8%	17.9%	15.2%	24.5%	25.1%
2 persons/household	50.5%	57.2%	54.8%	46.8%	48.6%	49.2%	50.9%	47.8%	55.4%	55.4%
3 persons/household	70.2%	74.2%	73.5%	65.9%	68.3%	67.7%	70.5%	68.1%	73.6%	73.2%
4 persons/household	89.4%	88.4%	90.4%	85.0%	87.6%	86.2%	88.5%	87.9%	89.5%	88.8%
5+ persons/household	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Household Distribution by Vehicles Available in 1990										
0 vehicles	2.7%	8.1%	3.2%	5.8%	4.5%	7.3%	3.7%	2.4%	5.4%	6.4%
1 vehicle	27.5%	38.3%	30.8%	27.0%	26.7%	30.3%	25.1%	21.7%	34.4%	35.0%
2 vehicles	48.8%	38.6%	47.7%	43.6%	44.6%	38.9%	44.0%	49.1%	43.0%	41.6%
3 vehicles	15.7%	11.3%	13.9%	16.6%	17.3%	17.1%	20.0%	19.3%	12.9%	12.8%
4 vehicles	4.2%	2.9%	3.3%	5.0%	5.4%	5.0%	5.5%	5.2%	3.2%	3.3%
5 or more vehicles	1.1%	0.8%	1.0%	2.1%	1.6%	1.4%	1.7%	2.2%	1.0%	1.0%

Processed by the Transportation Department of the North Central Texas Council of Governments.

TABLE B-2 (Continued)

CENSUS DATA FOR THE DALLAS-FORT WORTH AREA

ITEM	Collin	Dallas	Denton	Ellis	Johnson	Kaufman	Parker	Rockwall	Tarrant	Total CMSA
Cumulative Distribution of Households in 1990, by Vehicle Availability										
0 vehicles/household	2.7%	8.1%	3.2%	5.8%	4.5%	7.3%	3.7%	2.4%	5.4%	6.4%
1 vehicle	30.2%	46.4%	34.0%	32.8%	31.2%	37.7%	28.8%	24.2%	39.9%	41.3%
2 vehicles	79.0%	85.0%	81.8%	76.4%	75.8%	76.6%	72.8%	73.3%	82.8%	83.0%
3 vehicles	94.7%	96.3%	95.7%	92.9%	93.1%	93.7%	92.8%	92.6%	95.7%	95.7%
4 vehicles	98.9%	99.2%	99.0%	97.9%	98.4%	98.6%	98.3%	97.8%	99.0%	99.0%
5 or more vehicles	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Average Number of Vehicles Available per Household in 1990										
Owner-occupied households	2.18	1.99	2.14	2.14	2.14	2.03	2.17	2.25	2.05	2.05
Renter-occupied households	1.49	1.29	1.50	1.46	1.46	1.34	1.56	1.62	1.39	1.35
All households	1.95	1.65	1.87	1.95	1.98	1.87	2.04	2.11	1.78	1.75
Median Household Income (Family and Nonfamily)										
1980 (in 1979$)	$24,200	$18,571	$20,862	$16,966	$18,252	$15,585	$17,245	$23,055	$18,642	$18,870
1990 (in 1989$)	$46,020	$31,605	$36,914	$30,553	$30,612	$27,280	$30,592	$42,417	$32,335	$33,105
Median Household Income for 1990 (in 1989$)										
Family	$52,987	$36,982	$44,945	$34,710	$33,765	$31,348	$35,139	$47,397	$38,279	$38,911
Nonfamily	$26,639	$22,373	$20,829	$12,336	$13,419	$10,766	$14,282	$22,083	$20,616	$21,531
All households	$46,020	$31,605	$36,914	$30,553	$30,612	$27,280	$30,592	$42,417	$32,335	$33,105
Mean Household Income for 1990 (in 1989$)										
Family	$63,166	$48,625	$50,531	$39,949	$38,430	$37,052	$40,592	$57,020	$45,710	$48,195
Nonfamily	$32,933	$28,726	$25,058	$17,733	$18,831	$17,622	$18,485	$27,881	$25,429	$27,230
All households	$56,159	$42,432	$42,875	$35,938	$34,906	$33,414	$36,400	$52,036	$40,077	$42,210

Processed by the Transportation Department of the North Central Texas Council of Governments.

TABLE B-2 (Continued)
CENSUS DATA FOR THE DALLAS-FORT WORTH AREA

ITEM	Collin	Dallas	Denton	Ellis	Johnson	Kaufman	Parker	Rockwall	Tarrant	Total CMSA
Percent of All Households With 1990 Income (in 1989$):										
< $10,000	6.3%	12.3%	9.9%	15.7%	14.0%	18.4%	13.7%	7.7%	11.7%	11.8%
> $49,999	45.5%	26.7%	32.6%	23.3%	21.5%	20.4%	23.3%	40.7%	27.1%	28.3%
> $74,999	22.1%	11.2%	11.8%	7.6%	6.1%	6.1%	7.5%	18.1%	9.9%	11.3%
Total Housing Units in 1990										
Percent Owner-Occupied	61.5%	45.6%	52.2%	66.2%	68.8%	67.7%	69.9%	69.7%	51.9%	50.7%
Percent Renter-Occupied	30.8%	42.6%	38.6%	25.1%	21.6%	21.0%	18.6%	20.3%	37.4%	38.4%
Percent Vacant	7.7%	11.8%	9.2%	8.7%	9.6%	11.3%	11.5%	10.0%	10.7%	10.9%
Percent of Housing Units Without a Telephone in 1990										
Owner-Occupied	1.3%	1.4%	1.8%	5.4%	4.8%	6.6%	2.9%	1.1%	1.5%	1.8%
Renter-Occupied	8.6%	12.2%	8.0%	26.3%	23.6%	31.9%	20.1%	19.0%	13.2%	12.6%
Distribution of Housing Units in 1990										
Single Family	71.5%	56.3%	60.7%	73.8%	69.5%	74.7%	70.1%	78.8%	64.7%	61.4%
Multi-Family, 2-9 Units	11.0%	15.2%	11.9%	7.8%	3.0%	5.9%	3.9%	8.5%	14.6%	13.8%
Multi-Family, 2-9 Units	12.2%	25.8%	18.5%	3.9%	2.6%	2.1%	1.9%	2.9%	17.3%	20.1%
Mobile Home, Trailer, Other	5.3%	2.7%	8.9%	14.5%	21.9%	17.3%	24.1%	9.8%	3.4%	4.7%
Distribution of Owner-Occupied Housing Units in 1990										
Value less than $100,000	45.6%	68.7%	63.8%	81.1%	85.8%	85.8%	77.7%	51.8%	75.5%	69.6%
Value $100,000 - $199,999	42.2%	22.8%	31.6%	17.0%	13.0%	13.1%	20.4%	37.8%	19.9%	23.6%
Value $200,000 or more	12.2%	8.5%	4.6%	1.9%	1.2%	1.1%	1.9%	10.4%	4.6%	6.8%

Processed by the Transportation Department of the North Central Texas Council of Governments.

TABLE B-2 (Continued)

CENSUS DATA FOR THE DALLAS-FORT WORTH AREA

ITEM	Collin	Dallas	Denton	Ellis	Johnson	Kaufman	Parker	Rockwall	Tarrant	Total CMSA
Distribution of Renter-Occupied Housing Units Paying Cash Rent in 1990										
< $500 per month	77.3%	83.9%	74.1%	61.3%	92.0%	89.9%	92.2%	62.2%	83.9%	78.6%
$500 or more per month	22.7%	16.1%	25.9%	38.7%	8.0%	10.1%	7.8%	37.8%	16.1%	21.4%
Average Travel Time to Work Outside the Home, in Minutes										
1980	26.8	23.0	23.6	24.0	23.5	27.2	26.9	27.8	21.0	22.8
1990	25.2	24.0	25.6	25.9	26.7	30.1	28.6	30.5	22.5	24.0
Average Vehicle Occupancy for Trips to Work										
1980	1.15	1.14	1.15	1.20	1.18	1.21	1.20	1.15	1.14	1.14
1990	1.06	1.09	1.07	1.12	1.11	1.14	1.10	1.10	1.08	1.09
Employed Persons 16 Years and Over in 1990, by Occupation	145,946	962,376	153,373	39,378	44,802	22,670	29,647	13,241	598,945	2,010,378
Tech., sales, admin. support	37.6%	35.8%	37.7%	31.6%	30.5%	31.7%	31.5%	35.7%	35.3%	35.6%
Managerial, professional	37.6%	28.1%	32.0%	20.5%	20.2%	20.2%	23.2%	32.8%	27.9%	28.6%
Operators, fabricators, laborers	7.1%	12.8%	9.4%	19.3%	18.5%	15.5%	15.0%	9.3%	12.9%	12.5%
Service	8.3%	12.5%	10.4%	11.6%	12.0%	14.4%	10.7%	9.7%	11.7%	11.8%
Precision prod., craft/repair	8.2%	9.7%	9.1%	14.6%	16.2%	15.4%	16.5%	11.1%	11.2%	10.4%
Farming, foresty, fishing	1.2%	1.0%	1.3%	2.4%	2.7%	2.8%	3.1%	1.5%	0.9%	1.2%
Workers 16 Years and Over by Place of Work	143,844	943,146	151,068	38,768	43,968	22,239	29,236	13,108	591,229	1,976,606
In county of residence	44.9%	90.7%	43.6%	52.6%	44.3%	48.4%	37.8%	29.4%	79.2%	76.8%
Outside county of residence	55.1%	9.3%	56.4%	47.4%	55.7%	51.6%	62.2%	70.6%	20.8%	23.2%

Processed by the Transportation Department of the North Central Texas Council of Governments.

TABLE B-2 (Continued)
CENSUS DATA FOR THE DALLAS-FORT WORTH AREA

ITEM	Collin	Dallas	Denton	Ellis	Johnson	Kaufman	Parker	Rockwall	Tarrant	Total CMSA
Means of Transportation to Work for Workers Age 16 Years and Over										
Drive Alone										
1980	49,533	558,361	50,587	17,480	20,574	11,080	12,682	5,147	305,500	1,030,944
1990	119,849	718,709	123,027	29,484	34,192	16,359	22,961	10,376	480,647	1,555,604
Carpool										
1980	14,309	155,028	15,304	6,696	7,238	4,566	4,973	1,622	87,830	297,566
1990	15,280	135,776	18,263	7,265	7,223	4,657	4,618	1,968	77,987	273,037
Public Transportation										
1980	335	41,025	130	22	143	24	126	17	7,310	49,132
1990	1,225	38,345	621	100	25	22	108	62	3,697	44,205
Walk										
1980	853	16,236	2,502	652	808	506	444	80	8,974	31,055
1990	1,742	19,027	3,504	643	1,036	400	431	170	9,821	36,774
Work at Home										
1980	112	9,925	1,136	528	612	275	481	117	5,064	18,250
1990	4,176	20,480	4,078	804	1,185	658	901	456	12,378	45,116
Bicycle										
1980	97	1,195	416	31	73	15	8	9	628	2,472
1990	177	1,297	275	24	9	8	23	0	843	2,656
Motorcycle										
1980	282	3,772	606	96	210	49	123	14	2,619	7,771
1990	241	1,535	263	37	78	12	42	6	1,598	3,812
Taxi										
1980	30	616	33	48	0	32	0	0	180	939
1990	79	1,335	28	37	8	0	0	17	332	1,836
Other/Not Specified										
1980	1,606	3,962	526	167	146	158	170	54	2,206	8,995
1990	1,075	6,642	1,009	374	212	123	152	53	3,926	13,566
All Modes										
1980	67,157	790,120	71,240	25,720	29,804	16,705	19,007	7,060	420,311	1,447,124
1990	143,844	943,146	151,068	38,768	43,968	22,239	29,236	13,108	591,229	1,976,606
1990/1980	2.14	1.19	2.12	1.51	1.48	1.33	1.54	1.86	1.41	1.37

Processed by the Transportation Department of the North Central Texas Council of Governments.

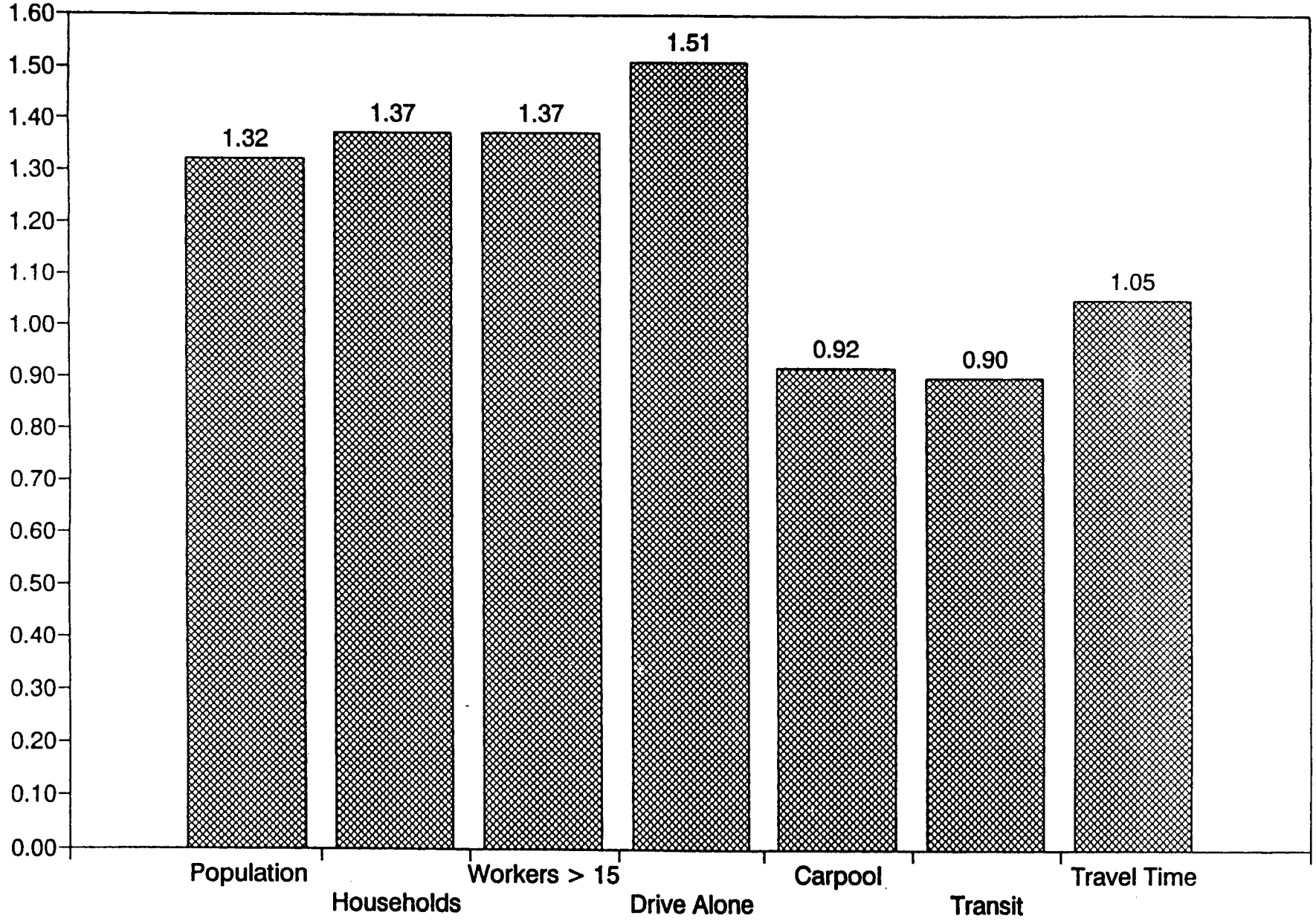
TABLE B-2 (Continued)

CENSUS DATA FOR THE DALLAS-FORT WORTH AREA

ITEM	Collin	Dallas	Denton	Ellis	Johnson	Kaufman	Parker	Rockwall	Tarrant	Total CMSA
Distribution of Workers by Means of Transportation to Work										
Drive Alone										
1980	73.76%	70.67%	71.01%	67.96%	69.03%	66.33%	66.72%	72.90%	72.68%	71.24%
1990	83.32%	76.20%	81.44%	76.05%	77.77%	73.56%	78.54%	79.16%	81.30%	78.70%
Carpool										
1980	21.31%	19.62%	21.48%	26.03%	24.29%	27.33%	26.16%	22.97%	20.90%	20.56%
1990	10.62%	14.40%	12.09%	18.74%	16.43%	20.94%	15.80%	15.01%	13.19%	13.81%
Public Transportation										
1980	0.50%	5.19%	0.18%	0.09%	0.48%	0.14%	0.66%	0.24%	1.74%	3.40%
1990	0.85%	4.07%	0.41%	0.26%	0.06%	0.10%	0.37%	0.47%	0.63%	2.24%
Walk										
1980	1.27%	2.05%	3.51%	2.53%	2.71%	3.03%	2.34%	1.13%	2.14%	2.15%
1990	1.21%	2.02%	2.32%	1.66%	2.36%	1.80%	1.47%	1.30%	1.66%	1.86%
Work at Home										
1980	0.17%	1.26%	1.59%	2.05%	2.05%	1.65%	2.53%	1.66%	1.20%	1.26%
1990	2.90%	2.17%	2.70%	2.07%	2.70%	2.96%	3.08%	3.48%	2.09%	2.28%
Bicycle										
1980	0.14%	0.15%	0.58%	0.12%	0.24%	0.09%	0.04%	0.13%	0.15%	0.17%
1990	0.12%	0.14%	0.18%	0.06%	0.02%	0.04%	0.08%	0.00%	0.14%	0.13%
Motorcycle										
1980	0.42%	0.48%	0.85%	0.37%	0.70%	0.29%	0.65%	0.20%	0.62%	0.54%
1990	0.17%	0.16%	0.17%	0.10%	0.18%	0.05%	0.14%	0.05%	0.27%	0.19%
Taxi										
1980	0.04%	0.08%	0.05%	0.19%	0.00%	0.19%	0.00%	0.00%	0.04%	0.06%
1990	0.05%	0.14%	0.02%	0.10%	0.02%	0.00%	0.00%	0.13%	0.06%	0.09%
Other/Not Specified										
1980	2.39%	0.50%	0.74%	0.65%	0.49%	0.95%	0.89%	0.76%	0.52%	0.62%
1990	0.75%	0.70%	0.67%	0.96%	0.48%	0.55%	0.52%	0.40%	0.66%	0.69%
All Modes										
1980	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
1990	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Processed by the Transportation Department of the North Central Texas Council of Governments.

FIGURE B-1


Census Data for Dallas-Fort Worth CMSA
Growth Ratio, 1990 / 1980
1.60
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
1.32
1.37
1.37
1.51
0.92
0.90
1.05
Population
Households
Workers > 15
Drive Alone
Carpool
Transit
Travel Time

FIG[illegible]B-2

Census Data
For the Dallas-Fort Worth CMSA

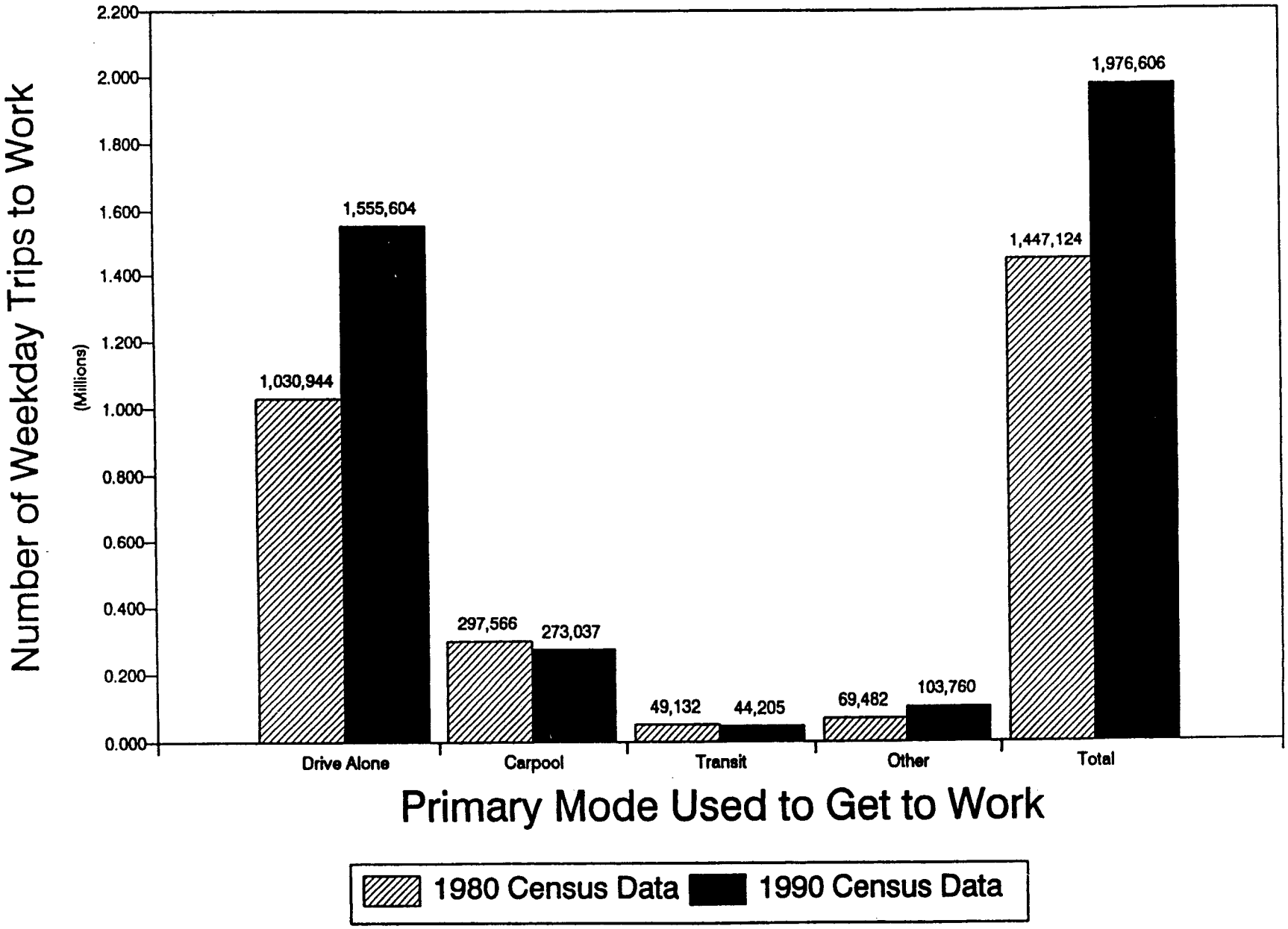
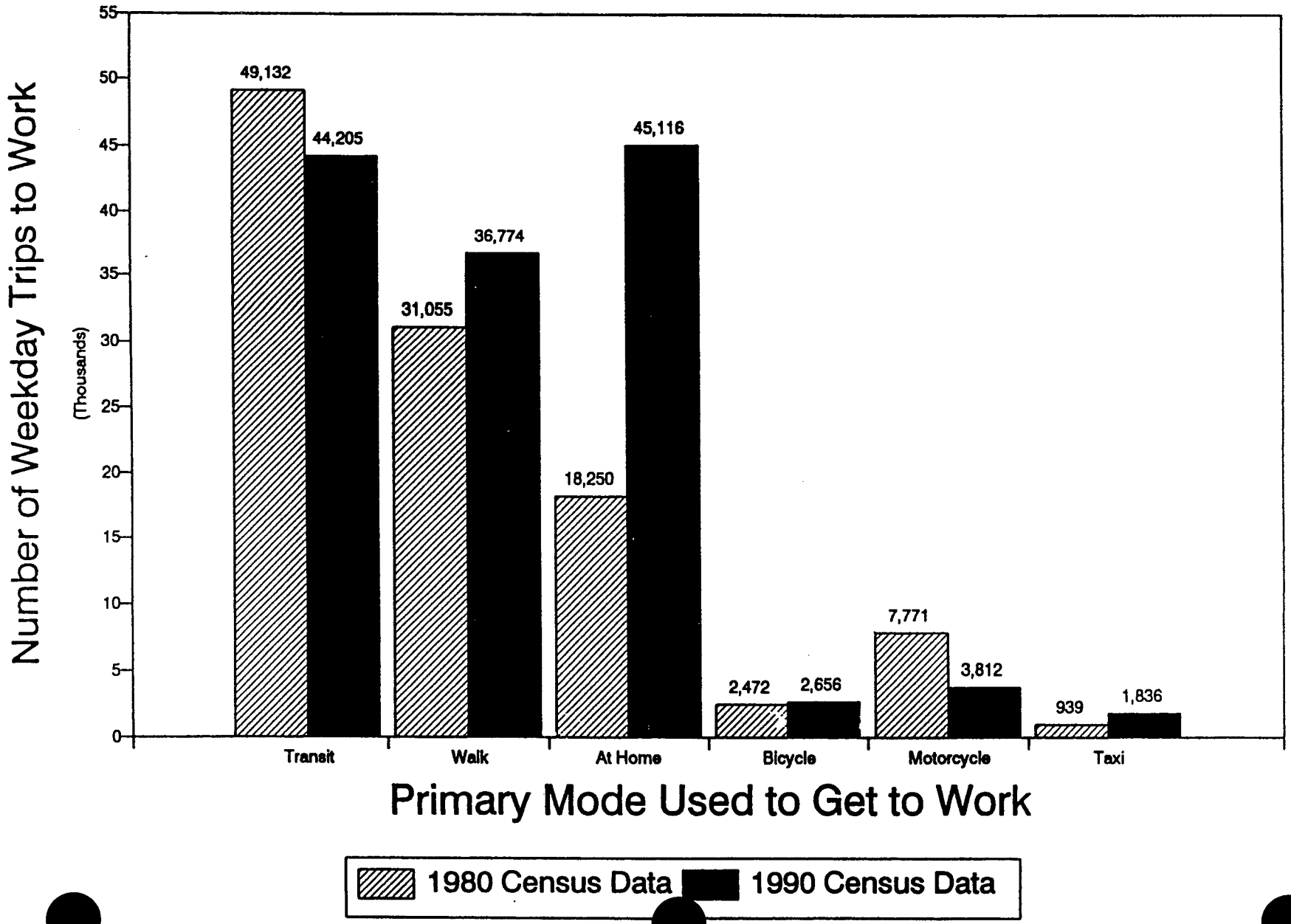


FIGURE B-3

Census Data
For the Dallas-Fort Worth CMSA



APPENDIX C

Additional Suggestions Made by the Travel Survey Peer Review Panel

April 14-15, 1994

North Central Texas Council of Governments
616 Six Flags Drive
Arlington, Texas 76011
(817) 640-3300

Revealed Preference (RP) Survey:

- Always ask if the respondent may be contacted again for a "follow-up" or future survey.

- When considering captivity of zero-car households, be very careful of the household definition. Two college roommates, for example, should perhaps be treated as two separate households. The Census Bureau defines this as one household.

- The data retrieval method used in the recent Portland survey (a "memory jogger" and abbreviated activity diary sent to each respondent, with most data collected by pencil-and-paper telephone retrieval) seems effective and should be seriously considered.

- Treat airport and school trips as trip purposes separate from all other categories. The survey also needs to include bicycle and pedestrian choices.

- Four principal activity classifications should be considered: household sustaining, social development, social activities, and rest/recreation.

- A "babysitter" who might stay with a young child at the child's home should be included as a member of the household.

- It would be highly desirable to distinguish between family and non-family carpools.

- It would also be desirable to find out who pays (or would pay) for highway tolls.

- Be careful not to ask so many questions that the quality of the survey results may be endangered.

Stated Preference (SP) Survey:

- The RP survey should be used as a filter for the SP survey to locate those households and individuals relevant for a particular issue. It is therefore important for SP survey requirements to be identified before the RP survey is fielded.

- The SP survey needs to follow the RP survey closely enough that things will not have changed significantly for most households.

- Some screening attitudinal questions could be included in the RP survey that may assist in the final design of the SP survey. Focus groups may be needed to facilitate the design of specific questions for the SP survey.

Annual Panel Survey:

- A question about recontacting should be set up in the original RP survey.

- The panel should continue for at least three years, but preferably "forever." It may replace the need for a large decennial cross-sectional survey, but will require frequent "refreshment" of households that choose to drop out.

- Panels are important for forecasting life-cycle changes and changes in household structure.

- SP issues could be included with the panel survey to examine various policy issues as they arise or become important to decision makers. The panel could also be used to address issues related to a Congestion Management System.

- Financial incentives, perhaps in the region of $10 per household per survey, are likely to be needed for panel participation.

- If data on summer time travel characteristics is needed, a separate panel should be drawn from the original RP sample.

Appendix E

A Recent Interviewer Manual for a Telephone-Mail-Telephone Household Travel/Activity Survey

HOME INTERVIEW SURVEY MANUAL

Prepared for the
Pima Association of Governments
Tucson Travel Survey

Prepared by:
NuStats, Inc.
March 1993

1. INTRODUCTION

The Travel Survey will obtain desired travel information by interviewing a cross section of households in the Tucson area. This manual describes the procedures for conducting the travel survey telephone interview. Prior to your data collection call, each household assigned to you will have been contacted and will have agreed to participate in the survey. The pre-interview is the first phase of the two phase telephone travel survey - 1) Pre-interview sample households, and 2) Collect travel information in a telephone interview of sample households. The households were selected by a carefully designed process to assure a statistically valid random sample of 1,800 households in the region. Each of the households will have been assigned a travel day and mailed a packet of materials which includes a cover letter, a reminder card, instructions with an example of a completed trip diary, and a trip diary for each household member *5 years of age or older*.

The survey will obtain travel and related data for every household member 5 years of age or older. It will be your job to call and collect the needed household and trip information. Information will include the number of trips made, the origin and destination of each trip, the beginning time and ending time of each trip, the mode of travel utilized and the purpose of the trip.

<u>You, the interviewer, are the key contact with the individual trip-makers in this project. The information you collect and record will largely determine the reliability of the results.</u> This is especially important since only a small number of households are being randomly selected to be interviewed. Only about one in every 1,000 households will be interviewed. Since one interview will represent the travel habits of those 999 other households, errors made in the interview will be greatly magnified. This is why it is important to collect complete and accurate information from each household.

Please read and study this manual carefully. It will be used to train you and to help you obtain the most complete and accurate information possible. It will be a reference guide for you throughout the interviewing process.

2. INSTRUCTIONS TO THE INTERVIEWER

It will be your responsibility to call sample households at the designated time and to obtain detailed information about the household and trips made by persons living in the household. The trip information will be obtained for a pre-specified day, hereafter referred to as the Travel Day. Interview forms should always be filled out and completed by you, and turned over to your supervisor at the end of each telephone interviewing session.

Your immediate responsibilities include the following:

- Read and become thoroughly familiar with the contents of this manual and your work packet before the practice interview portion of the training session.

- Come to your training session prepared to listen, learn and ask questions when you don't understand.

Your ongoing responsibilities include the following:

- Completing your assignments on time;

- Turning over to your supervisor the work completed each day, including completed household data forms and trip diaries;

- Keeping a daily record of your work, the time you spend, the number of calls you made and their results, including a separate record of completions;

- Notifying your supervisor immediately when you encounter problems or have questions;

- Conducting yourself in a businesslike and professional manner.

You should let your supervisor know if you have any problems and ask advice in unusual situations. The supervisor will review your work every day and will advise you on how to avoid mistakes. The supervisor will help ensure that your work will be of the highest possible quality.

You will be given the following forms and materials:

- Travel Survey Household Data Forms.. This form, which is explained question by question in Section 4 of this manual, asks for information about the household you are interviewing, such as how many persons live in the household.

- Trip Diary. The trip diary which is also explained in detail in Section 4, is to be completed for each family member or visitors five years of age or older for the travel day.

- Call Record Form (Tally Sheet). This report records your daily hours worked and phone calls classified by outcome.

2.1 WHAT IS A TRIP?

It is important that you understand what a trip is, so that you can explain it to the household members who respond to the survey.

If, for example, on your way to work, you stopped at the day-care center to drop off your child, that is one trip. Continuing your travel from the day care center to your place of work is a second trip. If you leave work in the morning to go to the Post Office, that is a third trip, back to work is a fourth trip, to a restaurant to have lunch is a fifth, if you walk back to work that is a sixth trip, etc.

For simplicity, a trip is defined as a vehicular or walking mode of travel of one block or more. (A walk trip is counted only if the person walks one block or more).

3.
CONDUCTING THE INTERVIEW

When you contact your assigned household by telephone, you should already be familiar with the interviewing guidelines in this section.

3.1 ASK THE FIRST QUESTION AS SOON AS POSSIBLE

After introducing yourself, continue immediately with the filling out of the household survey form. Have the form ready before you call. The sooner you get the respondent to participate in the interview, the better. Starting off with the questions and answers is <u>much more</u> desirable than trying to describe the types of questions you are planning to ask.

If a respondent questions the purpose of the survey, explain that it is being conducted by the Pima Association of Governments to better plan and improve transportation and air quality needs in the area and that certain information about travel of the residents of the area is necessary.

If you are asked why you are interviewing this particular household, explain that this is one of the addresses randomly selected. Assure them that the selection was <u>completely random</u> and had nothing to with who lives at this address. Also, stress that any information gathered from them is confidential. If it is necessary for you to give additional information, base it on your knowledge of the survey and use your own words. If you do not know the answer, tell the respondent you will refer the question to your supervisor if they would like. If they would like to speak to the project manager, they can call Jesse Casas at 1-800-447-8287. Travel diaries will have been sent to all households before the interview. Be sure to ask if all members of the household have completed travel diaries before you begin asking questions. Ask the person to whom you are speaking to bring the completed diaries to the phone. A completed trip diary will be a big help in completing the trip information on your trip report. Travel information may be taken by the interviewer for each member of the household over age five by having a household member read off each member's Travel Diary. If a member did not fill out a Travel Diary, a time must be arranged to call back and talk to that individual directly, unless they are under sixteen years, in which case a responsible adult can provide the data.

Sometimes you will get an answer that does not furnish the kind of information you need or that is not complete. In such instances, you should ask additional questions, being careful to get the person to explain, without you suggesting what the answer should be. The interviewer should always be satisfied that the most complete and accurate answers have been obtained to all questions.

The above is especially important when completing the trip report for each person. A person may describe travel that he or she considers one trip, but which is actually several trips in terms of the definition of a trip used in this study. An example of this would be a trip that has intermediate stops, with the different purpose for each of the different segments of the trip. Also, a respondent may give you all the trips he or she remembers making on the travel day, but leave out some routine trip that he or she would not consider as important. For example, he or she might have made a trip to the grocery store at 9:00 P.M. to pick up a loaf of bread for the next morning. It is important for the interviewer to be certain that all trips are surfaced and recorded.

In asking additional questions, both to get clarification or explanation of an answer or to assure yourself that all trips have been mentioned, be careful not to suggest a particular answer to the question. Some general phrases that can be used without leading the respondent are below:

1. "Please explain that a little more."

2. "Could you be more specific?"

3. "I'm not sure I understand. Would you explain that again?"

3.2 ASKING QUESTIONS

Follow the order of the questions on the survey forms and do not skip around. The wording and order of the questions have been tested to give the desired information. So ask them the way you have been taught in your training.

A person may not always understand the question when it is first asked. If you sense from the answer that he or she does not understand, repeat the question in the same way you did at first, as politely as you can.

In most cases, you will need to fit your questions to the situation and the information you have been given. People often forget or overlook a trip that they made. A good interviewer must sometimes follow-up a response with a probing questions. The following is an example of an appropriate and an inappropriate probe:

Acceptable (Doesn't suggest a particular answer)	Not Acceptable (Suggests a particular answer)
On your way home from work yesterday, did you make a stop for any reason along the way?	Did you do any shopping on your way home from work yesterday?

3.3 HOUSEHOLD MEMBERS NOT PRESENT

If a member of the household is not present for the interview, a responsible related household member may give the information for someone under 16 years of age who lives there, but is not present at the interview. If you cannot get the necessary information from a completed Travel Diary and the missing member of the household is 16 years old or older, it will be necessary to call back to interview this person within the next or at most two days to get the information on his/her travel diary. Try to set a time and date to call this person.

3.4 OTHER HINTS

After you have asked a question, listen to the person until he or she is completely finished giving an answer. Do not interrupt before the person has finished, especially if he or she hesitates. Hesitation often means that a person is trying to recollect some fact, and he or she should be allowed to do this. Also listen and do not write while the respondent is giving the answer. Wait until after he or she has finished to record the reply. Otherwise, you may miss an important fact. At the end of the reply, you can then ask for clarification or for the respondent to repeat part of the answer, if necessary.

3.5 CONFIDENTIALITY

The information you collect on this survey is confidential and is to be used only to generate statistical summaries for transportation planning in the Tucson area. Any information you collect must be kept confidential, and you must not discuss it with anyone other than those working on the survey.

3.6 REFUSALS

Since all households you will be interviewing already have been contacted by telephone and have agreed to be interviewed, it is not likely that anyone will refuse to cooperate. If someone does refuse to be interviewed, try to find the reason. If a person questions why the survey is being done, explain its purpose and stress that all results are confidential. If they would like more information, instruct them to call Jesse Casas at NuStats, Inc. 1-800-447-8287. Be as factual, concerned and businesslike as possible. Do not get into an argument or take the refusal as a personal affront. If the person still refuses, end the conversation politely. Notify your supervisor of the refusal, and the reason why; your supervisor will decide if a follow-up inquiry is necessary. **A very important note to remember:** *All refusals must be **fully** documented.*

3.7 RESCHEDULE

There may be special circumstances under which the interview travel date may need to be rescheduled. Under most circumstances, we will accept a report of zero (0) trips caused by illness, vehicle failure or being out of town. However, if a household forgot their travel day and could not reconstruct that day's travel, it will be necessary to reschedule the household's travel day and call back to collect the data. If it is necessary to mail a new travel survey packet, the travel day should be scheduled to allow for mail delivery. These decisions will be made by your supervisor.

3.8 QUESTIONS/COMPLAINTS/COMMENTS BY MEMBERS OF SAMPLE HOUSEHOLD

Persons in the household may have questions, complaints, comments, or suggestions about the survey or about transportation in the area. It is not your job to answer these questions or to get into debates or arguments about them. Be polite yet firm if such a situation should arise and suggest that they put their concerns into writing to:

Richard Corbett
Pima Association of Governments
Transportation Planning Division
100 N. Stone Suite 1100
Tucson, AZ 85701

3.9 INTERPRETERS

Occasionally, you may encounter a person who does not speak English. If you cannot get someone to understand you or you cannot understand them, try to get someone else in the house to help. If you cannot communicate with anyone in the house, you must contact your supervisor about getting some assistance and let someone else handle that interview. We may have an interviewer on the staff who speaks that language.

3.10 REVIEW YOUR WORK

The completed interview forms will be checked and rechecked a number of times before the information is tabulated. The most important check, however, is the one you do as soon as you get off the phone. Take a few moments to go over each form to make sure that all the information is complete, each question is answered, and you are satisfied with the answers.

You should also review your completed forms at the end of each session. If you realize that you have missed something, call back the household to obtain the missing information. A checklist will be provided (and must be attached to all completed interviews) containing a list of the most important pieces of information that you will need to look for.

3.11 RECORDING THE INFORMATION

Recording the information accurately is as important as asking the questions properly. You should write all responses in pencil, clearly and distinctly, adjusting your writing to the amount of space you have. If additional space is needed, make use of the comments space on the forms. If a change is required, erase the original answer and make a new entry. Avoid copying the questionnaire over, as this is time-consuming and can be a source of error.

HOW TO FILL OUT THE SURVEY FORMS

The survey questionnaires consist of 11 x 17-inch sheets. The "face sheet" is the first sheet and is used to collect the household data. Trip reports for each member of the household over the age of five must be filled out.

Space has been provided for recording data for 9 persons, five years of age or older, per dwelling unit. Should additional spaces be required (in case there are more than 9 household members), use an additional Household Questionnaire. If a second form is used, you must:

1. Copy the travel day, date, and sample number of the original form into the identical spaces on the second form.

2. Copy the information recorded in Section I, Household Data, of the original form into the identical spaces on the second form.

3. Renumber the person numbers appearing in Section II, Person Data, of the second form, by crossing out the "01", "02" etc. and writing a "10" or "11" etc. as appropriate.

The sample number appears on the label on the "face sheet". It is a unique number and it MUST appear on all trip sheets for a sample household. Do not forget to record the sample number on *each* trip diary on the upper left hand corner. Space has been provided on the Trip Report form for recording trip information for nine trips. Should additional space be required, use additional Trip Report forms. If a second form is required, transcribe the sample number (in the upper left-hand corner of the form), the sheet number (in the upper right-hand corner of the form), and the travel day and date. A separate Trip Report must be filled out for each person, including visitors, in the household 5 years of age or older making trips.

The travel day and date, the sample number, and residence address will already be entered on the front of the survey questionnaire when you receive it. If any information is missing, obtain and enter it before beginning the interview if possible.

.INTRODUCE YOURSELF

Start the interview by introducing yourself:

> Hello, my name is _____, and I'm calling on behalf of the Pima Association of Governments. We called a short time back and arranged a travel day with (Mr., Mrs., Ms. (From label), and sent you a packet of survey materials. Your travel day was _____ and I'm calling back to collect the travel information. Do you have your travel diaries handy?

If the person did not use or does not have his or her trip diaries, say "That's all right, if you will tell me about the travel you made, we can complete the interview". Be sure and circle "2", "No" under "Used Diary?" (Section II, Person Data, Column I) for that person. Then continue asking the questions from the Household Data Section. Set up a callback date and time if they were filled out but are not available at the moment.

HOUSEHOLD DATA (Section I)

Item I-1 Question: Is the label at the right correct?

At the top of the form, a label with the full street address of the survey household should already have been attached; check to see if the information is correct. If changes need to be made to the label circle "2" (no) and make the appropriate changes very neatly.

Item I-2 Question: Is your residence . . . ?

Ask the respondent whether the structure type is single-family detached, condominium or townhouse, duplex or other multiple attached unit, apartment, or mobile home, and circle the type of residence on Line 2 of Section I. If none of these, circle "other".

If necessary to determine residence structure types, use the scheme listed in Table 1. By definition, a separate structure has open space on all four sides.

TABLE 1
RESIDENCE STRUCTURE TYPES

1. Single-Family Detached: Use if there is only one dwelling unit in the structure.

2. Condominium or Townhouse: Townhouse, Condo, etc. - Separate entrance to each unit.

3. Duplex/other multiple attached unit: 2-4 "homes" attached by a common wall.

4. Apartment: Use if there are five or more dwelling units in the structure with separate entrances to each unit.

5. Mobile Home: Use for housing which is considered "mobile".

6. Other: Use "Other" for living quarters which do not meet the above specifications.

Item I-3 Question: How many people live in your household?

Write the number of persons on the line to the right of the question. Enter the number of persons whose usual place of residence is at this location. Visitors are not be counted on this line.

Item I-4 Question: How many people are five years of Age or older, living at this address?

Write the number on the line to the right of the question. Enter the number of persons, five years of age or older, whose usual place of residence is the sample dwelling unit. Age refers to age as of the last birthday.

Item I-5 Question: How many months of the year do you live in the Tucson area?

Write the number of months on the line to the right of the question.

Item I-6 Question: How many out-of-area visitors stayed with you on your travel day?

In addition to the persons ordinarily living at the address, the interviewer must determine if there were any visitors, five years of age or older, in the house on the Travel Date. Persons to be counted and included in this space must:

- Have a usual place of residence OUTSIDE the Tucson Metropolitan Region Study Area.

- Have been present in the household on the Travel Day.

Item I-7 Number of cars, trucks, vans, RVs, motorcycles, or other motor vehicles available for use by this household?

This includes any commercially owned passenger cars or automobiles garaged at this address and available for use by members of the household.
Enter the number of motor vehicles available for use by residents to the right of the question. Company-owned cars (including government cars) which are operated by a resident at the interview address, can be used for personal trips, and normally parked or garaged at the interview address, will also be included. Station wagons, jeeps, pickup trucks and vans will be included. Other trucks, buses, taxicabs, and junked vehicles (those which will not run and will not be fixed) will not be included.

Item I-7(1-4) What is the households newest motor vehicle TYPE and year? (not make)
What are the total miles on it?
How many miles were put on it in 1992?
Find out the appropriate information to the questions. If they say they don't know or are not sure, then probe them the best you can to get some type of answer-possibly their best guess.

Continue for cars up to 3 maximum. (asking what is the next newest etc. ?)

You will also want to record any company vehicles/or other that they used on the travel day.(Line 4)

Item I-8 **How many bicycles are available for use by your household?**

Write the number on the line next to the question.

Item I-9 **What was the combined income from all sources for all members of your household in 1992?**

"Please indicate the letter of the appropriate category in which their total family income falls." Read ranges and letters if necessary.

Note the multiple-choice range of answers in the box below the question on the form. Circle the appropriate letter.

If the respondent declines to answer, tell them we need to get a representative sample of the area and that the information will be strictly confidential if they still refuse write an "RF". Family income is defined as the approximate gross (total earnings before taxes) income for the calendar year 1992 (as would be reported on Federal and State Income Tax returns).

II DATA FOR PERSONS FIVE YEARS OF AGE OR OLDER

Information on every person five years of age or older, including all residents at the sample address and out-of-area visitors, must be listed in this section. One line should be used for each person.

Item II-A Person Number

Each line has already been numbered to identify the person being listed. If there are more than 9 persons to the household, use another form and change the person numbers to 10, 11, etc..

Item II-B Question: What is the first initial of person (read person#)

Write the appropriate initial in the space provided.

Item II-C Question: Was an out-of-area visitor present on your travel day?

Circle "yes" or "no" - whichever is appropriate.
Note: An out-of-area visitor is considered to be someone who lives <u>outside</u> the Tucson Travel Study area.

Item II-D Question: How old are you? (How old is he/she).

Write the respondent's answer to this questions in the appropriate space. Enter the age as of last birthday for each person listed; if exact age cannot be obtained, enter the best estimate. Sometimes age is a sensitive question, and in that case accept an approximate age such as a five year interval. For example, "Could you tell me if you are between 20-24, 25-29, 30-34, 35-39, etc." The midpoint of the age interval is then entered, e.g., 20-24 = 22.

Item II-E Sex?

Do not ask the respondent this question unless necessary; obtain the answer by listening to voice tone and from reported names. Circle "1" for male or "2" for female.

Item II-F Question: Are you licensed to drive - (Is he or she licensed to drive?)

If the respondent or a household member has a driver's license, circle 1 for "Yes," if not, circle 2 for "No."

Item II-G Question: Did you (or person referring to) make any trips on the assigned travel day.

In other words, did they go anywhere that day. Anywhere in town, anywhere outside of town etc. Anywhere outside their street block will count as "a trip".

Item II-H Question: What is your employment status?

If necessary, read status categories and circle the appropriate response. This can be a multiple response.

Item II-I Question: What is the name of your employer? (If two or more list the one where worked more hours)

Write in the name of their employer in the space provided.
(not what type of place it is) - that is the next question.

Item II-J Question: What type of place is that?

Describe what type of place, FOR EXAMPLE: Doctors office, restaurant, post office, school etc.

Item II-K Code Do not fill this in. -For editor's use only.

Item II-L Question: Did you go to work (on travel day)?

If the respondent went to work on the Travel Date, circle 1 for "Yes." If he/she was sick, on leave, vacation, or otherwise not at his/her place of employment, circle "3" no. If the respondent is a student, do not circle "Yes" unless he/she went to a part time or other job that he/she holds. If the respondent worked from the home on the travel day, circle "2" worked at home.

Item II-M Question: Did you (or person referring to) make any trips while at work (on the travel day)? Lunch, personal errand, etc.?

Circle "1" for yes or "2" for no.

Item II-N Question: Did you (or person referring to) use the travel diary?

Appropriately circle "1" for yes or "2" for no to show if the person used his or her travel diaries that we sent in the mail. If they never received them, or filled them out and they are not available, circle no.

(Section III) TRIP SUMMARY

This section will be completed from trip data when all of the interview information is collected and the Trip Reports are entirely filled out with all errors and omissions corrected. Do not fill this out until the Trip Reports are completed. This section is not to be asked to the respondents. You will tally this information.

Item III-A Total vehicular trips reported at this address

Enter the total number of vehicular trips reported at this address on the line to the right of the question.

Note: Be very careful in what you enter here because it will be entered into our computer system and be calculated into reports.

Item III-B Persons, five years of age or older, making trips

Enter the number of persons, five years of age or older, making trips on the line to the right of this question.

Item III-C Persons, five years of age or older, not making trips

Enter the number of persons, five years of age or older, not making trips on the line to the right of the question.

Item III-D Complete or incomplete interview code

Do not make any entries here; for editor's use only.

IV ADMINISTRATIVE (Section IV)

Several administrative items will ensure that the survey form can be completed in a timely and accurate manner. Enter the items listed below in the space provided on the form.

Item IV-A Telephone contacts with respondent, if any

Note the date and time of each attempt at telephone contact with the household, whether the contact was successful or not. Following the date and time, enter the call outcome. State the outcome as concisely as possible, but be sure you provide sufficient information so that a supervisor can identify what happened.

Item IV-B Completed interview submitted

Fill in the date and time when a completed interview has been obtained. Include your initials. Also, sign the statement included, which reads:
"I certify that all information on this form is correct and true"

Do not sign this statement until you are absolutely sure that the forms are completely and accurately filled out.

Item IV-C Interview submitted incomplete

If after your best efforts to complete an interview, you are forced to submit an incomplete interview, enter a full explanation of your reasons here. This will aid in analyzing survey results. If some items of information were not obtained, explain here. Also enter notes about callbacks, special situations, etc. Enter any comments or explanations that might be helpful to your supervisor and the Home Interview Study in reviewing the Household Questionnaires and Trip Reports turned in as complete. Following the comments, be sure to include the date and your initials, as this will allow for follow-up contact at a later date.

Item IV-D First Edit
Item IV-E Final Edit

These spaces are for the use of office editors and coders. Do not make entries in these two items.

4.5 TRIP REPORT

The Trip Report will be used to record the travel data of the survey.

It is imperative that the interviewer be constantly alert for signs that indicate travel the respondent has not recalled. You will learn to ask additional questions to remind the respondent of trips he or she may have forgotten. If we overlook just one trip, the loss represents about 1,000 trips because we are only taking a sample of households.

Be alert to family members who do not work outside the home (i.e. retired, student, homemaker), but who list work trips. Ask tactful questions to determine what kind of work (e.g. part-time, volunteer). Equally important, be alert for persons who reported work trips on the travel day but, who do not report trips.

Item A Person Number

The travel record is linked to the household data by sample number and to specific individuals in the household by person number. It is IMPERATIVE THAT THE CORRECT PERSON NUMBER BE ENTERED. IT IS FOR THIS REASON THAT WE OBTAIN THE NAME, AGE AND SEX OF PERSON FOR WHOM TRAVEL IS BEING REPORTED. ASK THE RESPONDENT FOR THE FIRST NAME, AGE AND GENDER OF THE PERSON TO WHOM THIS TRIP REPORT REFERS. WHEN YOU HAVE THE NAME, AGE, AND SEX ENTERED, TURN TO THE HOUSEHOLD RECORD II-A PERSON NUMBER AND ENTER INTO Item-A. Say to the respondent - "the travel information we are now going to record is for _____ who is _____ years old". Enter person number or travel report.

Be sure to enter the appropriate sample number and travel day information on each Trip Report form, if it is not already filled in. Enter the name of the person whose trips are being recorded. (Sample number is or label or "face sheet".

Person Number - Enter the person number which corresponds with the trip maker in the coding box (See Section II, Column A). For example, the head of the household is listed as 01 in II-A. A "01" would be placed in the Person Number box to the right of the respondent's name on the travel record.

Age - Be sure and write in the trip maker's age on the line below the Person Number.

Sex - Be sure and write in the trip maker's sex on the line next to age.

It is not necessary to obtain the trip information in the order that the persons are listed in Section II. Thus, if you choose, you may list first the trips of persons 03 and 04. Report first for those persons whose trip information can be obtained on the first call. **REMEMBER THAT A SEPARATE TRIP REPORT MUST BE USED FOR EACH PERSON MAKING TRIPS.** Before turning in your completed diaries place trip records in the appropriate person order (1, 2, 3...)

Item B First Trip

The "My first trip today began at" box is used to record the origin of the first trip a person makes on the travel day. Most first trips begin at home, and the only entry will be a check (√) in the Home Box.

Now and then, a person's first trip will begin someplace other than home. In that case, place check (√) in the "other" location box, and enter the address of that place. When this happens, find out the kind of place and enter here. For example, the person's first trip in the area may have begun at the airport coming into the Tucson area from another city.

Item C Trip Number

Use one line for each trip made. The first trip each individual makes is always number "1", and subsequent trips are numbered consecutively in the order in which they were made. The trip number appears in the first column on the travel record. Item-B, first trip origin has already been assigned a trip number of "0".

In the event that a trip is recalled out of order, record it when mentioned, and renumber the trips for that person so that they fall in chronological order.

Item D Question: From _____ you went to where? What is the address of the place where this trip ended?

Write the respondent's answer to this question in the appropriate space. Included are spaces for an address/intersection, city, and zip code. You must attempt to obtain information adequate to fill in all three entries. DO NOT attempt to code the respondent's answer.

Additional Information

Definition: Destination refers to the point where each person making a trip actually ends the trip, such as a person's home, an office, a store, theater, bank, school, factory, etc., and does not refer to the points to where a person must walk to board a bus, or to where the automobile is parked. In other words, this inquiry refers only to the ultimate destination of the specific trip being recorded. (Note; the destination of trip 1 is usually the origin for trip 2 and the destination for trip 2 is usually the origin for trip 3, etc. When this is not the case, make a comment on the questionnaire explaining the situation.

Saving Time: For trips ending at the sample dwelling unit, the word "Home" may be entered on the name of place line to save time.

Pinpoint Exact Blocks: For any other location within the survey area, you must be more specific. In general, an acceptable description of a destination which is inside the survey area will be one which will permit coders to pin it down to the exact block, an address, a corner or an intersection, or a place name.

Trips Outside Study Area: For destinations for trips made by automobile to places outside the survey area, the name of the city or town is sufficient.

IMPORTANT:

Acceptable Information: The acceptable description will include one of the following, depending on the location information obtainable from the respondent. Strive to obtain the house or building number (address), the street name, and the city, state and zip code. This is preferred type of location description. However, if the respondent does not know the exact address, the closest intersection can be accepted or failing that, the name of the place. Always get the city and if possible, the zip code.

GEOGRAPHIC LOCATION (Most Preferred)
Street Number, Street Name, City, Zip Code
(Number Streets should be written "10th", not "Tenth")

INTERSECTION
Street Number & Street Name, City, Zip Code

ESTABLISHMENT LOCATION (Least Acceptable)
Place or Name of Establishment, Street Name (if available), Zip Code

Vague Answers: If vague answers are given, try by careful questioning to get the respondent to reconstruct the trip. Don't be satisfied with a response until you are certain that you have pinned it down as closely as you possibly can.

If the exact street number is not known, try to determine the name of the nearest street, then try to establish the name of the nearest cross street. If the destination is a well-known place, this will be acceptable, providing you distinguish it from other places having the same or a similar name. Also, find out the area of town in which the establishment is located.

Example: The Tucson Hotel

Another acceptable description would be the numerical range within which the address falls, providing this range extends only one block. If the street name is not known, try to determine the nearest intersection the respondent recalls, and attempt to obtain the direction and the number of blocks from this point. If possible, also ascertain the direction the street runs, side of street, etc. Also ask for area of town.

Example: McDonalds In 800 block of Walnut Street
North side of street
Tucson

As a last resort, in the case of an inexact response, after describing the location as best you can, obtain the full name of the person or place visited. If the interview is running smoothly and the respondent can easily consult a telephone directory or other personal records, you may be able to pin down the location by asking the respondent if he or she could look it up.

Terminals/Intercity Travel: A person intending to leave the survey area by airplane or bus may be taken to the station by an automobile, metro, bus, or taxi. In these cases, the first trip should be considered as ending at the station. The second trip would be from the station to his/her destination outside the survey area. The trip for a person arriving by airplane or bus from outside of the survey area would be recorded in a similar manner. In this case the external place outside the study area would be listed as Trip 00 and the station would be listed in Trip 01.

Survey Boundaries: For persons who left the survey area by automobile, likewise record the ultimate destination. The boundary of the survey area may be supplied to you on a map. If you are in doubt about whether or not a given point is inside or outside the survey area, obtain full information as if it were inside the area, so that a decision can be made at a later time.

Intersections: Some origins and destinations will be given as intersections. You should also be aware that in telling where they have been, people may report the nearest main intersection, even though they actually went two or three blocks away from this point and can report the exact place visited.

Street Names: Record the full name of the street or avenue to distinguished it from any other with a similar name. Some streets are numbered in two directions from some central point; thus there may be a 601 E. 8th and a 601 W. 8th Street. Be certain to include such designations as "west" or "east" or "north or "south" when it is essential part of the address.

Chain Establishments: Care should be taken to give the locations of prominent places which would be confused with other. For instance, there may be a number of McDonalds, etc., within the study area. Do not assume that it is the nearest one, or that the coders will know which one if referred to. Ask the respondent for its location and record it.

Item E **Question: What kind of place is that?**

Examples: Restaurant, Gas Station, Supermarket, Bank, Real Estate Office, Steel Mill, Professional Office, etc.

If there is a problem, ask the respondent what takes place at the destination and read the examples. **Item F Question: What was the purpose of the trip?**

The possible trip purpose codes are listed in this column. To review, the trip purposes are:

1. Home
2. Work
3. School
4. Shopping
5. Medical
6. Social/Recreation
7. Other Personal Business
8. Work Related
9. Pick up/Drop off Passenger
10. Change Mode of Travel
11. Other

Item G **Question: What time did the trip begin? At what time did the trip end?**

Write the respondent's answer to this question in the appropriate space. Enter times to the nearest minute, if possible, and be sure to circle the available designation (AM, or PM) appropriate for the time entered (AM morning, PM afternoon and evening). Noon is 12:00 PM and midnight is 12:00 AM.

Be alert for inconsistent responses, such as an hour trip in one direction and a 10 minute trip in the other direction when the same distance apparently was traveled in both directions. Trips beginning between 4:00 AM of the Travel Date and 4:00 AM of the following day are to be included in this survey.

Remember the times are leaving and arrival times, not the destination arrival and leaving time.
What time did they leave to the particular place?
What time did they get to the particular place?

Item H **Question: By what means did you travel?**

Note the multiple-choice answer for mode of travel shown on Trip Report form. Circle the number which applies in the appropriate coding box:

In the case of a truck driver making a trip to and from work or after work in a truck, record the mode of travel as "Auto". For a taxi driver who uses his/her taxi to go to work, such trips should be coded as "Auto" as well. Do not report trips made by truck or taxi drivers during the course of work; include only those walking trips destined to/from work.

Item I **Question: (If Driver) Which motor vehicle was used as listed on the household data form?**

You should circle 1, 2, 3, 4 (other), in this box - if they were the driver

Item J **Question: If the person was the driver of the vehicle, ask: "How many total persons were in the vehicle including yourself?"**

Record that number in the box.

Repeat the trip process until all trips for all household members/visitors have been recorded.

REVIEW

You are responsible for the completeness and correctness of all questionnaires you complete. Be sure to check over the filled-out form while you are on the phone and the respondent is available. This often can eliminate mistakes or fill in missing information. Any omission or error should, of course, be immediately corrected.

Appendix F

Recent RFP for a Vehicle Intercept Survey

SECTION IV
STUDY OBJECTIVES AND SCOPE OF WORK
Activity Four: External Station Survey

The overall objective of this study is to obtain accurate information on vehicle and person trips entering, leaving, and traveling through the study area which can be used to develop and calibrate travel demand models for use in travel forecasting and air quality planning.

Proposals should include detailed descriptions of how quality control will be maintained during data collection. This will be a specific requirement in the final contract and the successful firm will be held responsible for providing clean, usable, and accurate data for use in determining travel and air quality model inputs.

The External Station Survey will consist of taking traffic counts by time of day at 79 external station locations and conducting on-site roadside interviews at up to 39 of the external station locations. Despite the fact that it is easier to administer a mailback survey at higher volume stations, it is perceived that more reliable data is gathered through the personal interview process. The survey form and content, as shown in Appendix A, have been established in prior surveys and will collect the following data[2]:

1. Origin and destination of trip
2. Purpose of trip (local or through)
3. Number of stops made prior to external station within urban area
4. Time of day
5. Vehicle occupancy and classification

The External Station Survey will include the following five major tasks:

Task A. Site selection
Task B. Conducting the survey
Task C. Correcting survey data
Task D. Processing and geocoding survey data
Task E. Survey documentation and reporting

A twenty-four hour directional traffic count by time of day will be made at each external location on the same day of the survey. The survey interviews will be conducted during daylight hours for a duration of twelve hours on designated Study Area external stations. Weekday traffic counts and surveys will be conducted Monday through Thursday. No traffic counts or survey interviews will be conducted during inclement weather or on holidays.

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[2]Please note that the survey form is subject to revision, and any revisions to the survey instrument may require that a pilot survey be conducted.

Cost estimates must be submitted for the base survey and two survey options, one or both of which may be conducted if feasible. Figure 1, Required and Optional External Station Locations, shows the external stations, county, survey requirements for the base survey, and the additional work to be performed for the two survey options.

For the weekend survey option, it is expected that the consultant will survey either outbound traffic on Friday p.m./Saturday a.m. or inbound traffic all day Sunday using the same procedures and survey instruments as the weekday survey. The consultant may, however, propose a different methodology and schedule for the weekend survey.

The consultants must present cost proposals for the base survey and two options as defined above. A complete list of external stations with 24-hour traffic volumes is presented in Appendix C.

Task A. Site Selection

Each external station will require a traffic control plan which must be approved by H-GAC and TxDOT Houston District personnel and meet the requirements of the Texas Manual on Uniform Traffic Control Devices. TxDOT Houston District personnel will set up the traffic controls. The traffic control plan should detail a process for narrowing the traffic lanes down to one through lane in the outbound direction and address procedures to mitigate traffic congestion. Please note that cost for police personnel, etc. should be included in the proposal since these will be the responsibility of the consultant. It is recommended that a video tape be made of the traffic control devices before each survey in order to provide a record of the traffic control plan.

Task B. Conducting the Survey

The survey will be a personal interview of vehicles which have been directed out of the travel lane, onto the shoulder and stopped. If any driver does not want to participate, they will be allowed to leave. Surveys will be conducted only under favorable weather conditions.

Due to different volumes at each external station, the sample size will vary accordingly. However a minimum of 300 completed and usable surveys should be taken at external stations having 24-hour volumes of 1,000 or greater in each direction. The consultant should attempt to survey 100 percent of the vehicles at stations with 24-hour volumes less than 1,000 in each direction.

In addition to the sample external surveys, a 24-hour traffic count by direction and time of day in 15 minute increments will be taken at each external station on the day of the survey. Additional counts will be made at a particular external site if it's determined that the original count is invalid for any reason.

Finally, all vehicles passing through the survey station during the survey period will be manually classified by vehicle type.

Figure 1
Required and Optional
External Station Locations

Name	County	Volume	Survey Requirements	Survey Options
IH-10 E	Chambers	31,070	On-Site Surveys and 24-Hour Directional Traffic Counts by Time of Day	Option 1: Weekend On-Site Surveys and Directional Traffic Counts by Time of Day
IH-45 N	Montgomery	27,860		
IH-10 W	Waller	25,240		
US-59 N	Liberty	21,140		
US-59 S	Fort Bend	17,420		
US-290	Waller	9,040		
SH-73	Chambers	7,460		
SH-6	Waller	7,010		
SH-35	Brazoria	6,300		
US-90	Liberty	4,720	On-Site Surveys and 24-Hour Directional Traffic Counts by Time of Day	
US-90A	Fort Bend	4,470		
SH-36	Fort Bend	4,160		
FM-2025	Liberty	3,990		
SH-105	Montgomery	3,630		
SH-159	Waller	3,040		
FM-1725	Liberty	2,680		
SH-105	Liberty	2,570		
FM-521	Brazoria	2,390		
FM-1774	Waller	2,240		
FM-770	Liberty	2,210		
US-75	Montgomery	2,080		
FM-3081	Montgomery	2,030		
FM-442	Fort Bend	1,950		
FM-787	Liberty	1,880		
SH-146	Liberty	1,590		
FM-2611	Brazoria	1,530		
FM-1093	Fort Bend	1,420		
FM-1097	Montgomery	1,310		
FM-1301	Brazoria	1,280		
FM-529	Waller	1,090		
FM-1406	Chambers	840	24-Hour Directional Traffic Counts by Time of Day	Option 2: Week Day On-Site Surveys
FM-2919	Fort Bend	830		
FM-223	Liberty	770		
Shellhammer	Chambers	640		
FM-1458	Waller	610		
FM-2610	Liberty	570		
FM-1952	Fort Bend	560		
FM-149	Montgomery	520		
FM-1375	Montgomery	500		
40 Stations	Various	<500	24-Hour Directional Traffic Counts by Time of Day at 8 Randomly-Selected Stations and 24-Hour NON-Directional Traffic Counts by Time of Day at the remaining 32 Stations	

Task C. Correcting Survey Data

The external station survey data obtained will be coded and entered in a pre-specified format and forwarded to H-GAC on a 1.44 MB floppy diskette every two weeks. Data file formats used in surveys currently in progress are shown in Appendix B. H-GAC will process the files using existing software designed to identify missing or inconsistent information. Those records identified as incomplete, illogical, etc., will be returned to the consultant for correction or further editing. The consultant will be responsible for correcting errors found in the data by H-GAC during the survey and within three months following the completion of the survey.

Task D. Geocoding Survey Data

It will be the responsibility of the consultant to geocode trip addresses from all of the usable responses to the existing traffic analysis zone (TAZ) structure and build the external through and external local trip matrices. Note that H-GAC may provide some assistance in matching addresses to TAZs through an existing address database and TAZ boundary file. In addition, H-GAC will provide the consultant with printed or digitized TAZ boundary maps.

The geocoding process will consist of the following steps:

- Building an address file for individual survey responses
- Matching address coordinates to TAZs by computer, with H-GAC assistance
- Manually matching to TAZs those address coordinates unable to be matched by computer
- Placing the TAZ numbers back on survey trip records

Although it will not be possible to geocode all surveyed trip records, previous experience indicates that up to 95% of the records should be codeable. A majority of address locations in the City of Houston should be codable through H-GAC's existing database. The consultant will geocode remaining address locations in Harris County and address locations in other counties manually. Those records which cannot be geocoded should be assigned a TAZ code of 8888. Those trip records indicating a trip which originated outside of the study area but entered on an unknown external station should be assigned a TAZ code of 9999.

Task E. Survey Documentation and Reporting

Following analysis of the data by H-GAC, a final external survey report documenting methodology and results will be prepared by the consultant. In particular, the report should contain sections on the following survey components:

- Survey Design
  Survey Instruments
  Refusal Summaries

- Survey Implementation
  Timetable
  Quality Control

- Geocoding

- Summary of Survey Results
  Trip Purpose
  Auto Occupancies
  Trip Origins and Destinations
  Mode of Travel
  Vehicle Types
  Vehicle Occupancy
  Trip Length Frequency

Each report section should contain tables, charts and/or graphs wherever applicable to improve clarity. In addition, a executive summary shall be provided highlighting important sections of the report.

Ten (10) draft copies of the external survey report and ten (10) draft copies of the executive summary must be provided in a timely manner for review and comment. Following acceptance of the final report and executive summary, twenty (20) final reports and one hundred (100) executive summaries must be prepared and delivered to H-GAC with all corrections and comments incorporated in the final versions. Final reports should be neatly bound with attractive covers. The final corrected version will also be delivered as a camera-ready original and on a floppy disk in a mutually agreed upon word processing format.

Completed external survey forms shall become the property of H-GAC. The forms shall be sorted by ID Number before they are turned over to H-GAC.

Appendix G

Recent RFPs for Onboard Transit Surveys

Onboard Survey RFPs

This section consists of four onboard survey RFPs:

- Seattle Metro, 1992;
- NJ Transit, 1990;
- New York City Transit Authority, 1995; and
- Chicago Transit Authority, 1993.

Seattle Metro, 1992

prior projects and current references. Details of your quality control standards and examples of their application to projects of similar size and scope are also required. Because this survey work is grant funded, proposers are required to complete a Consultant's certification regarding debarment, suspension, and other responsibility matter forms (Attachment 3).

Proposals should address in detail each task outlined in the attached scope of work and should identify the project team and the assignment of hours and staff to tasks. The allocation on staff hours and proposed costs should be specified by task, assuming a base sample of 500 bus trips and an average trip length of 1.5 hours. The incremental cost for each additional 100 trips up to 1000 trips total should be shown by task as well.

Minority/Women Business Enterprises
Equal Employment Opportunity

Firms are advised that Metro promotes equal employment opportunity and that it is Metro's policy that Minority and Women Business Enterprises shall have the maximum practicable opportunity to participate in the performance of its contracts. Minority Business Enterprises and Women Business Enterprises are strongly encouraged to submit proposals. Due to the lack of subcontracting opportunities, there are no minimum MBE or WBE goals established for this procurement. If the prime proposer elects to subcontract any work, then the prime proposer shall make affirmative efforts to utilize certified MBE's and WBE's. Questions regarding M/WBE and EEO requirements should be directed to Cheri Dalgaard at (206) 684-1339.

Selection Criteria

This contract will be awarded on the basis of the following criteria, listed in order of priority.

1. The experience and competence of the firm and its personnel, considering the type of services required, the complexity of the project, and the scheduling requirements.

2. Past record of performance on contracts with Metro, other public agencies, and private industry.

METRO
Municipality of Metropolitan Seattle
Exchange Building • 821 Second Ave. • Seattle, WA 98104-1598

July 9, 1992

Contact Name
Consultant Firm
Address
City, State ZIP

1992 Origin and Destination Sampled Survey Administration Request for Proposals

Dear Contact Name:

The Municipality of Metropolitan Seattle (Metro) is seeking proposals from qualified firms to administer an on-board survey to a sample of transit riders as part of the 1992 Origin & Destination (O&D) Study.

The survey administration services required will involve the hiring, training, and supervising of survey workers; coordinating survey worker logistics; and reconciling and preparing packets of completed questionnaires for data processing. The survey will be fielded on Tuesdays, Wednesdays and Thursdays over a five week period October 6 - November 5, 1992. A detailed scope of work for the project is attached.

Please note: This request for proposals differs in scope, sampling assumptions, and budget from an RFP issued under the same title in February 1992.

Procurement Process

The procurement of these consultant services will be in accordance with Metro and other applicable federal, state and local laws, regulations and procedures. The project is funded by a Federal Transit Administration (FTA) 1992 Section 8 discretionary planning grant and a Washington State Department of Transportation High Capacity Transportation Planning Assistance Grant.

As part of your proposal, please include a statement of qualifications containing a summary of the type of consulting services your firm has performed previously, concentrating on the kind of work requested in the scope of work. Include a list of

prior projects and current references. Details of your quality control standards and examples of their application to projects of similar size and scope are also required. Because this survey work is grant funded, proposers are required to complete a Consultant's certification regarding debarment, suspension, and other responsibility matter forms (Attachment 3).

Proposals should address in detail each task outlined in the attached scope of work and should identify the project team and the assignment of hours and staff to tasks. The allocation on staff hours and proposed costs should be specified by task, assuming a base sample of 500 bus trips and an average trip length of 1.5 hours. The incremental cost for each additional 100 trips up to 1000 trips total should be shown by task as well.

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Equal Employment Opportunity

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Selection Criteria

This contract will be awarded on the basis of the following criteria, listed in order of priority.

1. The experience and competence of the firm and its personnel, considering the type of services required, the complexity of the project, and the scheduling requirements.

2. Past record of performance on contracts with Metro, other public agencies, and private industry.

3. The firm's familiarity with problems associated with survey administration projects and the hiring, training and supervision of a survey worker team.

4. The quality and completeness of the firm's proposal in addressing each task in the scope of work.

5. The firm's capacity to perform the work within the time limitations, considering the firm's current and planned workload.

6. The proposed cost to perform the work (estimated range $25,000 - $35,000).

7. Satisfactory completion of the attached Sworn Statement Regarding Equal Employment Opportunity and the Project Employment Profile (Attachment 2).

Proposals are due by 5:00 p.m. Monday, August 10, 1992. Send or deliver five copies of your proposal to Metro at the following address:

Research & Market Strategy
Metro M.S. 53
Exchange Building
821 Second Avenue
Seattle, Washington 98104-1598
Attn: Diane Sutherland

Proposers may be asked to appear for interviews or presentations before a consultant selection committee. The committee will hold interviews with finalists, if necessary, within a week following the proposal due date and will notify the consultant selected for the work.

If you have questions or comments on this project, please contact me at (206) 684-1552.

Sincerely,

Diane Sutherland

Diane Sutherland
Research Analyst

DS
Attachments

Attachment 1

SCOPE OF WORK
1992 ORIGIN AND DESTINATION SAMPLED SURVEY ADMINISTRATION

INTRODUCTION

The Municipality of Metropolitan Seattle (Metro) is seeking proposals from qualified firms to administer an on-board survey to a sample of transit riders as part of the 1992 Origin & Destination (O&D) Study.

The survey administration and data collection services required consist of the following:

- Hire, train, and supervise survey workers
- Implement and supervise all on-board data collection activities
- Coordinate survey worker logistics
- Account for and prepare packets of completed questionnaires for data processing
- Prepare a written summary report on the project, and conduct a post-survey debriefing for Metro staff.

PURPOSE

Metro conducts Origin and Destination surveys periodically to provide data on passenger and trip characteristics. The data are used for long range transportation planning, transit ridership estimation, and for federal reporting purposes.

BACKGROUND

Metro operates fixed-route/fixed schedule bus service within King County with a service area of 2,128 square miles and a service area population of 1.5 million. Metro's 1990 ridership totaled over 73 million revenue passengers. Bus service operates from transit bases located in North Seattle, Bellevue, Tukwila, and near the Kingdome south of downtown Seattle.

METHODOLOGY

Assuming an average of 25 passengers per bus trip, between 12,500 and 25,000 questionnaires will be fielded on Tuesdays, Wednesdays, and Thursdays over a five week period, October 6 - November 5, 1992. The survey questionnaire will be developed and printed by Metro. A draft questionnaire and draft survey worker record card are attached.

Survey sample

The survey sample will be determined by Metro. Metro will provide the consultant with a list of bus trips to be surveyed, plus other pertinent information to be used in filling out survey worker record cards and planning survey worker assignments. The sample will consist of 500 - 1000 bus trips, with an average trip length of 1.5 hours. Survey worker assignments may consist of one or more bus trips, and may range from approximately 1.5 hours to over eight hours, including travel time. The sampled trips will operate between the hours of approximately 4 a.m. and 8 p.m.

Survey Administration

Metro operates a Ride Free Area within the central business district of downtown Seattle. Passengers may ride within the Ride Free Area at no charge, boarding a coach through any door. No survey administration will take place within the Ride Free Area.

Outbound service:
Outbound service is defined as service leaving an activity center, typically downtown Seattle. In general, outbound passengers outside the Ride Free Area pay their fare as they leave through the coach's front door. Survey administration on outbound service generally will take place after the coach leaves the Ride Free Area. Customers boarding the coach between the Ride Free Area and the last stop of the trip will receive a survey from a survey worker as they board.

Inbound service:
Inbound service typically travels to Seattle. Passengers on inbound service pay their fare as they board the coach through the front door. For inbound trips, survey administration will take place as customers board the coach and pay their fare.

For both inbound and outbound service, completed questionnaires will be collected by the survey workers as the passengers leave the coach, or passengers may return their questionnaires by mail.

TASKS AND PRODUCTS

In addition to general project management, Metro will be responsible for developing the questionnaire and selecting the sample.

The consultant will manage, under Metro staff direction, survey administration and data collection for an on-board survey of transit riders. The survey will take place on a specified sample of 500 - 1000 bus trips. The survey will be fielded on Tuesdays, Wednesdays and Thursdays over a five week period October 6 - November 5, 1992.

The selected consultant will be responsible for the following specific tasks and products.

I. Hire, train, and supervise survey workers

- Hire and supervise survey workers.
- Track survey worker performance. Ensure survey workers meet contract obligations. Take appropriate action in cases of poor performance, customer complaints, etc.
- Develop a training program for survey workers, subject to Metro staff approval.
    - The survey worker training program will include survey administration procedures, customer relations training with role playing, and address language/literacy concerns.
- Train survey workers. Metro staff will monitor the training sessions.

II. Survey worker duties

Survey worker duties include, but are not limited to:

- Distribute questionnaires to passengers. Refusals will be kept separate from undistributed questionnaires.
- Complete survey worker record cards.
- Record first and last serial numbers of questionnaires handed out on each trip.
- Accept returned questionnaires from passengers.

- Completed questionnaires will be collected by the survey workers as the passengers leave the coach, or passengers may return their questionnaires by mail.

- Answer customer questions on the survey or questionnaire.
- Track non-responses due to language/literacy difficulties.
- Complete other paperwork, as required.

III. Survey materials preparation

- Develop survey worker aids and materials, subject to Metro approval.
- Prepare survey worker record cards. Metro will provide the consultant with a list of bus trips to be surveyed, plus other pertinent information to be used in filling out survey worker record cards. A draft survey worker record card is attached.
- Assemble packets for each survey worker assignment. Metro will provide printed questionnaires.
- Provide other necessary materials such as collection boxes, envelopes, etc.

IV. Survey administration

- Establish survey administration procedures, subject to Metro approval.
- Develop and coordinate staff assignments and logistics.
    - Metro will provide a list of bus trips to be surveyed, as well as other pertinent information to assist the consultant in determining survey worker assignments.
    - The consultant will provide Metro with staff assignments and survey schedules by close of business on the Wednesday prior to each week of surveying.
- Develop a protocol for addressing missed trips.
- Distribute and collect survey packets and materials to/from survey workers on survey days.

- Account for survey packets at completion of each survey worker assignment and coordinate followup for bus trips missed on survey days.

- Account for and prepare packets of completed questionnaires for data processing:

  - Sort returned questionnaires by serial number

  - Check and group each trip's questionnaires by serial number.

  - Remove blank questionnaires from survey packets

  - Deliver record cards and reconciled survey packets to Metro weekly beginning 10/19/92.

V. Quality Control

- Supervise all phases of data collection activities including:

  - field checks of survey workers to ensure all sampled trips are surveyed;

  - identification and correction of in-field problems;

  - immediate identification and rescheduling of make-up surveying . Any make-up surveying must take place within the scheduled surveying period.

- Reconcile record card information with returned survey packet contents.

- Perform a daily review and reconciliation of irregularities in survey worker record cards.

VI. Post-survey tasks

- Prepare a written report on survey administration, data collection, non-response and quality control.

- Conduct a formal post-survey debriefing for Metro staff.

VII. Project Management Plan

The consultant will prepare a project management plan that describes in detail the project schedule, the project team, and the team's organizational structure. The plan

will identify key personnel, scope of services, progress reporting, and invoicing procedures. The consultant will prepare this plan in consultation with the Metro Project Manager.

VIII. Weekly Status Reports

The consultant will prepare weekly status reports for the project that describe the progress to date. The reports will also document any delays and their causes and solutions; changes to the scope of work, schedule, team composition; outstanding items requiring resolution; and major activities of the upcoming week. Copies of the weekly status report will be submitted to the Metro Project Manager by close of business of the second working day of the following week.

IX. Timeline

The consultant will meet the following timeline:

Project Milestone	**Completion Date**
Notice to Proceed issued.	9/10/92
Pick up printed questionnaires from Metro	9/15
Survey worker training program developed and approved by Metro. Survey worker aids and materials developed and approved.	9/23
Survey worker assignments and survey schedule determined and sent to Metro.	Weekly beginning 9/30
Survey worker training completed	10/2
Survey administration and daily survey packet reconciliation	10/6 - 11/5

Informal briefing of Metro staff following first week of surveying	10/12
Deliver reconciled survey packets to Metro	Weekly beginning 10/19
Post-survey administration briefing of Metro staff	11/19
Submit project summary report	12/15

METRO

Regional Rider Survey

Community Transit

330516

Here's your chance to help us plan better service by telling us about the places you're coming from and the places you're going. Please fill out a Regional Rider Survey form every time you get one. Then, return it to any Metro employee or office or drop it in your closest mailbox – postage free. Thanks for riding!

1. Route number of THIS bus: #_____

2. About what time did you get on THIS bus?

   _____ : _____ ☐1 a.m.
   hour minute ☐2 p.m. (incl. noon)

3. Did you use the wheelchair lift? ☐1 Yes ☐2 No

4. Have you already filled out a survey form today describing this bus trip as part of a transfer or round trip?
   ☐1 Yes--Check box and return. ☐2 No--Please continue.

Where I Came From

5. Which of these places did you come from last before getting on the bus?
   ☐1 Home ☐2 Work ☐3 College/school
   ☐4 Day care ☐5 Store/bank/other errands
   ☐6 Doctor's office/other appointments
   ☐7 Restaurant/movie/other recreation or social

6. Where is this place located?
   Please give street name, street type, and direction, for example: 1st Ave. S. & S. Lander St., Seattle, 98134.

   _____ Intersection or Address or Building Name
   _____
   _____ City
   _____ Zip Code

7. How did you get from there to THIS bus?
   ☐1 Transferred from bus route # _____
   ☐2 Walked
   ☐3 Drove/rode in car parked at park-and-ride
   Which lot? _____
   ☐4 Drove/rode in car parked on street
   ☐5 By ferry
   ☐6 Other _____

Where I'll Go

8. Which of these places will you go first after getting off the bus?
   ☐1 Home ☐2 Work ☐3 College/school
   ☐4 Day care ☐5 Store/bank/other errands
   ☐6 Doctor's office/other appointments
   ☐7 Restaurant/movie/other recreation or social

9. Where is this place located?
   Please give street name, street type, and direction, for example: 1st Ave. S. & S. Lander St., Seattle, 98134.

   _____ Intersection or Address or Building Name
   _____
   _____ City
   _____ Zip Code

10. How will you get there from THIS bus?
    ☐1 Transferring to bus route #_____, then to route # _____, then to route #_____
    ☐2 Walking
    ☐3 Driving or riding in car
    ☐4 By ferry
    ☐5 Other _____

Round Trip

11. Is this trip part of a round trip by bus today?
    ☐1 Yes ☐2 No (skip to question 14)

12. About what time will you (did you) start your bus trip in the other direction?

    _____ : _____ ☐1 a.m.
    hour minute ☐2 p.m. (incl. noon)

13. Will you use a transfer slip from THIS bus for your return fare?

    ☐1 Yes ☐2 No

please continue →

DRAFT

MAY 92
$1.00

Fare Payment

14. What fare did you (will you) pay on THIS bus?
    - ☐1 One zone
    - ☐2 Two zone
    - ☐3 Senior & disabled
    - ☐4 Youth (ages 5-17)

15. How did you (will you) pay your fare?
    - ☐1 Monthly pass
    - ☐2 Annual pass
    - ☐3 Three-month pass
    - ☐4 U-Pass
    - ☐5 Boeing pass
    - ☐6 Seafirst pass
    - ☐7 Cash
    - ☐8 Tickets
    - ☐9 Transfer
    - ☐10 Other _____

16. Did you (will you) pay a fare for any children who didn't fill out their own form?
    - ☐1 Yes
    - ☐2 No

17. If yes, for how many children? _____

Please answer these questions so we can group your responses with those of others like yourself.

18. Did you have a car available for this trip?
    - ☐1 Yes
    - ☐2 No

19. What age group are you in?
    - ☐1 5-9
    - ☐2 10-17
    - ☐3 18-24
    - ☐4 25-34
    - ☐5 35-44
    - ☐6 45-54
    - ☐7 55-64
    - ☐8 65 and over

20. Including yourself, how many people live in your household?
    - ☐1 1
    - ☐2 2
    - ☐3 3
    - ☐4 4
    - ☐5 5
    - ☐6 6 or more

21. Are you:
    - ☐1 Female
    - ☐2 Male

22. Which of the following best describes your ethnic background?
    - ☐1 Asian-Pacific
    - ☐2 Asian-Indian
    - ☐3 Black/African American
    - ☐4 Hispanic
    - ☐5 Native American
    - ☐6 White/Caucasian

23. What was the total gross income for your household last year?
    - ☐1 Less than $7,500
    - ☐2 $7,500-14,999
    - ☐3 $15,000-24,999
    - ☐4 $25,000-34,999
    - ☐5 $35,000-54,999
    - ☐6 $55,000-74,999
    - ☐7 $75,000-99,999
    - ☐8 $100,000 and over

Thank you!

April 1992

To mail: Fold in thirds with Metro address showing and drop in any mailbox – postage free.

No Postage Necessary If Mailed In the United States

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 10919 SEATTLE, WA

POSTAGE WILL BE PAID BY ADDRESSEE

METRO
Research and Market Strategy Division
Municipality of Metropolitan Seattle
821 Second Avenue, M.S. 53
Seattle, WA 98104-9986

DRAFT

Survey Worker Instructions

Base _____ Sign-In _____

TOPS # _____ Combo # C-_____ Route/Run # _____/_____

Survey forms issued to you: First # _____ - Last # _____

For the trips listed on the back of this card:

✓ **Issue survey forms to passengers <u>as they board</u>; do not issue forms to passengers as they leave.**

✓ **Issue forms in numerical order; always start with <u>lowest</u> number**
✓ **If a passenger refuses a survey form, <u>do not</u> reissue; place in envelope marked *Survey Returns*.**

✓ **Only issue forms between the start and end locations listed; <u>do not issue forms in the Ride Free Area (RFA)</u>.**

✓ **On the back of this card, log the serial numbers of the <u>first</u> and <u>last</u> survey forms you issue <u>on each trip</u>.**

✓ **Put forms that passengers hand back to you in the envelope marked *Survey Returns*.**

✓ **Please place all survey materials in the big envelope, then seal it and return it to the base.**

Tips
✓You should have more forms than you'll need; call the coordinator if you run low
✓Correct any errors we've made on the back of this card
✓Passengers may mail in their completed forms; if passengers leave forms behind, place in *Survey Returns* envelope

Route	Start of Trip			End of Trip	
	Time	Location	First Serial # Issued	Location	Last Serial # Issued

DRAFT

Your ID # _____

NJ Transit, 1990

NJ TRANSIT RIDERSHIP SURVEYS

LOCAL BUS

INTERSTATE BUS

RAIL

NEW JERSEY TRANSIT CORPORATION
REQUEST FOR PROPOSAL
RFP NO. _____

NJ TRANSIT RIDERSHIP SURVEYS

SCOPE OF WORK

I. PROJECT PURPOSE

The purpose of this project is to provide NJ TRANSIT with a data base of origin/destination trip patterns, system utilization characteristics and rider demographics for its statewide system of local bus, interstate bus and rail services. The surveys will cover both peak and off-peak time periods. The study is funded as part of the UMTA Section 8 program.

II. PROJECT DESCRIPTION

A. Introduction

NJ TRANSIT is one of the largest transit systems in the nation. NJ TRANSIT is a statewide operator of transit services, including 177 bus routes, 10 rail lines, and the Newark City Subway. Currently, ridership on NJ TRANSIT'S rail system carries over 160,000 daily trips and there are over 420,000 daily bus trips.

NJ TRANSIT's system serves numerous unique market areas. NJ TRANSIT's service mix provides for short distance trips, long distance trips, trips within New Jersey, and trips to New York and Philadelphia. In addition, these services are provided across a spectrum of urban, suburban, and rural areas within New Jersey. Finally, peak and off-peak services are provided, with some services carrying almost as many off-peak riders as peak riders.

The complexity of the system is also indicated by the varying demographic profiles of our riders by mode. **Attachment #1** indicates NJ TRANSIT's latest available information on the demographic profiles of our local bus, interstate bus, and rail riders. While the information is outdated, the wide range of income, auto ownership, sex and age between the different market areas is an indication of some of the diversity of demands placed on the system.

Knowledge and understanding of the trip patterns and user characteristics of our system is critical in shaping decisions. NJ TRANSIT assembled a substantial data base of commuter travel and attitudinal data in the period from 1983 to 1986, principally for the interstate bus and rail riders travelling to Manhattan. These data, combined with 1980 Census journey-to-work data, were used to formulate ridership projections for trans-Hudson travel and to develop models for predicting ridership by mode for potential new investments in the transit system. The data gathered from the surveys in conjunction with the Census data were essential elements in preparing analyses of operating budget, capital budget, fare policy, marketing, service and growth investment decisions over the last five years.

However, the Census data and the actual travel pattern data is clearly dated. In addition, NJ TRANSIT has never collected complete origin/destination travel pattern data on its largest market, local bus. Further, since the early 1980's, the nature and number of trips in NJ TRANSIT's service area have changed dramatically.

B. Ridership Trends

NJ TRANSIT Overall Ridership Trends

During the period FY 1984 - FY 1987, overall ridership on NJ Transit Bus and Rail systems saw steady growth. Bus system growth reversed during FY 1987. Between June 1986 and the end of FY 1989, Bus ridership declined 4.1%. Rail reached its peak ridership in May, 1988 and declined 3.3% by the end of FY 1989.

Causes of Ridership Changes

Changes in NJ TRANSIT ridership are a function of numerous factors. Principal among them are the economic and demographic forces which result in the change in number of trips and the dispersion of trips in the region. NJ TRANSIT benefits with regional growth which is targeted in the densely developed transit corridors and cities. NJ TRANSIT loses riders when job and residential locations become more and more dispersed as recent trends indicate. The overall economic health of the region also affects transit ridership. As the economy prospers and unemployment falls, many more people opt to purchase cars to make their trips. As indicated previously, auto ownership has risen much faster than population in New Jersey. It should be noted that more than 90% of NJ TRANSIT interstate bus and rail riders have cars in their households. On the other hand, local bus riders are significantly more transit dependent, with over 40% of the households not owning a car (1986 survey data).

The relative cost differential between transit fares and the cost of driving a car also affect transit ridership. The compound fare increase over the past 34 months totalling 36% appear to have diverted some commuters to other modes. Recent surveys indicate that the higher fares are contributing to a reduction in discretionary use of the system. The almost unbroken decline in the real cost of gasoline since 1981 has kept the growth of out of pocket car operation expenses well below the rate of recent transit fare increases. Since its peak in 1981 (about $1.35/gal.) the real average cost of unleaded gasoline in New Jersey has declined about 55% (to about $1.05/gal.), when the compound inflation rate of 40% over the period is accounted for.

Finally, reliability and quality of service also affect ridership. While recent performance has been consistently reliable, rail on-time performance was a significant deterrent to ridership during the summer of 1988. On the bus side, during the peak ridership to New York in 1987, the Exclusive Bus Lane (XBL) experienced a breakdown in reliability due to the volume of bus traffic in the lane. This resulted in a "cap" in bus ridership. Overall, riders generally expect consistent service quality, and any deteriorations in

service can translate into ridership loss, particularly if compounded with any of the other factors which influence the choice to take transit.

Rail Ridership by Market Area

Each NJ TRANSIT rail line is a distinct "market area" which can be further segmented by destination in New York or New Jersey, and by the amount of service offered in the peak vs. off-peak periods.

The slowing of the overall regional growth rate and changes in the geographic incidence of jobs occurring in the last several years has had an impact on our Rail ridership. This is particularly true of Rail services which carry a high proportion of riders to lower Manhattan where the bulk of F.I.R.E sector jobs are located. These rail lines -- Pascack Valley, Main/Bergen, Morris and Essex -- lost the most ridership during the past fiscal year. As a result, Hoboken Division ridership declined during FY 1989. The Raritan Valley which also has a high proportion of riders destined to lower Manhattan experienced a decline. On the other hand, lines with direct service to midtown Manhattan, the NEC and NJCL, recorded slight or flat ridership trends.

In addition to the influence of the reduction of jobs in lower Manhattan on NJ TRANSIT Rail ridership, it is clear that those services with predominantly peak period weekday service have also sustained greater ridership losses than rail lines with a full service offering including off-peak, reverse direction and weekend trains. The greatest ridership losses were experienced on the Pascack Valley and Montclair Branch services which have only peak period services and are therefore almost totally dependent on the job market for ridership. On the other extreme, the Northeast Corridor and the North Jersey Coast Line which have a strong profile of reverse direction, off-peak and weekend services, have recently recorded growth primarily because of growth in these non-commuter services.

Bus Ridership by Market Area

NJ TRANSIT has carved its bus services into eight market areas based on geography and type of service. The market areas are:

North Jersey Local
North Jersey Commuter
New York Commuter
North Jersey Special

South Jersey Local
South Jersey Commuter
Philadelphia Commuter
South Jersey Special

New York Commuter Bus ridership has been relatively steady because of its midtown Manhattan destination, but it has been vulnerable to ridership losses from job shifts to Bergen County (Bergen County employment grew dramatically during the past three years, far out-pacing all expectations) and traffic problems hampering XBL access and reliability. Recent trends also point to an erosion NJ TRANSIT ridership on Route 9 due to fare and service competition. Finally, the conditions at the Port Authority Bus Terminal have become a major deterrent to commuters and in particular, for discretionary travellers.

North Jersey Commuter Bus services, connecting Newark with the suburbs such as Livingston, Butler, and Somerville, experienced slight ridership increases as downtown Newark employment has grown and as several routes have responded to "reverse" commuting patterns from Newark to the suburbs. However, since the last fare increase this modest growth was also reversed, and in the past quarter, ridership is down greater than the systemwide average. This is also a market segment which may have seen diversion to auto as people can afford to purchase cars or need cars to access new job locations.

North and South Jersey Local Bus ridership remained relatively steady even after successive fare increases until the May 1989 fare increase. The most recent trends indicate a drop in ridership, particularly in South Jersey. The decline in cash fare passengers is a primary contributor to these trends. These are transit dependent markets, as evidenced by low auto ownership rates and low income profiles relative to NJ TRANSIT's other markets. However, auto ownership appears to be on the increase along with the prosperity in the economy.

North Jersey Special Services, including the Newark Airport and the Park/Ride lot services have suffered significant losses during the past two years. Newark Airport ridership has fallen precipitously as a result of declines in departures from the airport. Over the last year, airport traffic has declined approximately 10 percent. In addition, NJ TRANSIT has had competition with another bus carrier serving the New York market. Finally, NJ TRANSIT can no longer pick up and drop off riders at the terminals themselves, and riders must find their way to a bus loading zone. Park/Ride services which carry a substantial number of discretionary and occasional transit riders have experienced some losses in ridership, particularly at the Vince Lombardi lot which serves primarily Bergen County.

The Philadelphia metropolitan area has been relatively weak economically, though the suburban New Jersey portion of the region has posted sizable gains. During the last year, employment in Burlington, Camden and Gloucester counties expanded at a rate of 3.5%. The major problem was the city of Philadelphia, where total employment actually fell by 0.7%, a decline of 5,000 jobs. As a result, **Philadelphia Commuter Bus** ridership has been declining. In fact, this trend was experienced almost without interruption since the beginning of 1986. The relatively inexpensive cost of auto commutation and the rise in NJ TRANSIT fares have also been key factors in this trend.

South Jersey Commuter Bus services have recorded record growth in the past three years, due principally to employment growth in the Atlantic City casino industry, although recently, there has been a slowing of growth in this market.

C. Census Data and Travel Surveys

Once every 10 years the Census collects information on the characteristics of the population and on the work trips of the employed labor force. The work trip data, combined with the demographic data, is valuable for transportation planning and travel forecasting. These data form the basis for calibrating population and employment forecasts, trip projections, and mode split models.

There are significant shortfalls with the Census journey-to-work data which result in difficulties in accurately and efficiently developing transportation planning and forecasting tools. These shortcomings can be overcome by the collection of actual travel data from riders coincident with the census so that the shortcomings can be remedied.

The specific shortfalls in Census journey-to-work travel data which are to be overcome by this project are enumerated below:

1) The Census data is collected only once every 10 years. In a rapidly changing environment like the New York/New Jersey metropolitan area, the value and adequacy of the Census data base becomes limited in a matter of two or three years.

2) The Census does not collect travel data for non-work trips.

3) The definition of travel modes in the Census is ambiguous. For example, it is difficult to distinguish between interstate bus service and local bus service, and there is no way to distinguish between the Newark City Subway, Commuter Rail, PATH, or the New York City Subway in many of the Census data files.

These problems with the Census data result in difficulties in properly developing travel forecasts and planning tools. In addition, the lapse of time between one Census and the next requires agencies to spend significant resources performing large-scale surveys in the intervening years to update essential data sources.

D. Project Overview

NJ TRANSIT needs updated travel and demographic data for local bus, interstate bus and rail riders. This information is critical for marketing, fare policy, service, park/ride, and budget analyses. In addition, many of the shortcomings of the Census data will be remedied by collecting origin-destination travel data from current NJ TRANSIT riders coincident with the Census. Specifically NJ TRANSIT needs to collect updated origin-destination data from its local bus, suburban commuter bus, interstate bus, subway and rail riders. By collecting origin-destination and demographic data from riders on NJ TRANSIT's system, the following benefits will be provided:

1) NJ TRANSIT will have a sorely needed travel and demographic data base which was last developed for interstate bus and rail in 1983.

2) NJ TRANSIT will have travel data and up-to-date demographic data for the local bus system for the first time.

3) By collecting both Census and rider survey data at the same time, mode definitions will be clarified by comparing the data bases.

4) Actual travel pattern data will be collected in the same year as the Census journey-to-work data. The surveys will also collect peak and off-peak ridership data. This will allow a translation between the Census travel definitions and NJ TRANSIT's operating definitions for travel periods. By having this "cross-walk" between the data sources, updates can be performed in future years on smaller samples, but with high reliability.

5) Surveys of riders between Census years will be more efficient and it will be easier to update major regional data bases.

6) The updated Census and travel data will enable NJ TRANSIT and other regional transportation agencies to update forecasting and modelling tools as well as create an effective base for updating travel data between the 1990 census and the next census.

III. SCOPE AND PERFORMANCE OF WORK

A. Project Objectives

The objectives of this project are to:

1. Collect information on the peak and off-peak travel patterns, rider demographics and riders' travel needs on the following NJ TRANSIT modes:

   Local Bus
   Interstate Bus
   Rail

2. Develop a computerized data base of travel patterns and demographic information for use by NJ TRANSIT.

B. Project Scope

This project has three major components -- a local bus survey, an interstate bus survey and a rail survey. Each of these is described in more detail in the following paragraphs.

Local Bus Survey

NJ TRANSIT needs a complete set of information on the travel patterns and needs of local urban bus riders who represent a major part of our bus system. No local bus travel surveys have ever been conducted. The local bus market is a difficult market to survey due to the socio-economic characteristics of the market and the types of trip patterns that exist. Given the vast amount of local bus service operated by NJ TRANSIT, the collection of origin/destination data for each route is a massive undertaking. While the goal of the project is to collect a route-specific profile of travel data, the project budget may not accommodate a sample design at the bus route level for all local routes across the state. **Attachment #2** includes a listing of annual bus ridership by route.

For sampling purposes, it may be possible to group local bus markets into larger sampling units. Local bus services could be grouped into larger sampling units according to similar service characteristics, geographic coverage, the density of land uses served, or ridership patterns. Another approach to the sample problem would be to identify certain critical local bus routes and limit the sampling to these routes only.

Consultants are expected to address this issue in their proposals and are requested to recommend the most appropriate sampling plan to obtain representative origin and destination ridership profiles, demographic characteristics, and riders' needs.

Interstate Bus Survey

The last complete interstate bus surveys dealing with both peak and off-peak trips were conducted by the Port Authority of New York and New Jersey in 1981 and updated based on ridership trends in 1983. Peak origin/destination data was updated with another Port Authority survey in 1986. These surveys dealt only with trans-Hudson bus riders. The information from these surveys was critical in trans-Hudson demand analyses, investigations of options for expanding trans-Hudson bus capacity, service analysis and park/ride studies. Since that time, many of the bus routes have been modified, and the patterns of ridership origins and destinations have changed significantly. While some surveys of Philadelphia interstate routes were performed during the early 1980's, this market has also changed dramatically. **Attachment #2** also contains annual bus ridership by route for interstate bus routes.

Trans-Hudson bus surveys have traditionally been performed by distributing questionnaires to riders boarding outbound buses at key intercept points in New York, the George Washington Bridge Bus Station and the Port Authority Bus Terminal. Trans-Hudson bus services which do not serve either of these terminals have been surveyed by distributing questionnaires on bus seats at the originating garages. Philadelphia services can be surveyed by distributions at terminals, key boarding points, or on-board distributions. Questionnaires are usually collected through postage-paid return mail.

NOTE: The Port Authority will be conducting a survey of private carrier interstate bus services at the same time that NJ TRANSIT collects data about its bus system. The consultant may wish to consider a joint survey proposal to encompass the entire system of NY-NJ interstate bus services. See Exhibit A of this RFP.

Consultants are expected to address the data collection issues in their proposals and recommend appropriate sampling plans to obtain representative origin and destination ridership profiles, demographic profiles and an identification of riders' needs for the interstate bus market.

Rail Survey

The last complete peak and off-peak rail surveys were conducted in 1983. At this time, NJ TRANSIT surveyed all its rail lines by distributing questionnaires to each boarding rider at each station. Questionnaires were collected at the terminals or through postage-paid return mail. The Port Authority also surveyed PATH riders in 1983, providing two comparable data bases for rail and PATH ridership. The information from these surveys was critical in trans-Hudson demand analyses, investigations of options for expanding trans-Hudson rail capacity, rail rolling stock planning, service analysis and park/ride studies.

In 1986, NJ TRANSIT and PATH surveyed peak trans-Hudson riders only. These surveys served as updates to the peak portion of the Rail and PATH travel information. NJ TRANSIT distributed these questionnaires in New York Penn Station, Newark Penn Station and Hoboken Terminal to passengers boarding outbound evening peak trains. Questionnaires were collected using postage-paid return mail.

NJ TRANSIT views the off-peak rail travel market as a potential major source of new revenue to NJ TRANSIT. Thus, it is particularly important to assess off-peak travel patterns and riders' needs to develop off-peak pricing, service, and marketing strategies.

NOTE: The Port Authority will be conducting a survey of PATH riders at the same time that NJ TRANSIT conducts its rail survey. At two of the PATH stations, Newark and Hoboken, PATH passengers are primarily, but not totally, transferring from the commuter rail system. The other five PATH stations accommodate only non-rail transfer passengers. The consultant may wish to consider a joint survey plan in its proposal to encompass all commuter rail and PATH passengers (see Exhibit A of this RFP.)

Attachment #3 lists average rail ridership by line and by train.

Consultants are expected to address the data collection issues in their proposals and recommend appropriate sampling plans to obtain representative origin and destination ridership profiles, demographic profiles and an identification of riders' needs for the rail market.

C. Project Steering Committee

This is a complex project which involves very close coordination within NJ TRANSIT and between NJ TRANSIT and the Port Authority. To ensure maximum support and guidance for this project, a Steering Committee will be appointed for this project with membership from NJ TRANSIT Planning, Operations, Finance and Marketing and from the Port Authority.

NJ TRANSIT will participate in this project in an administrative capacity only. Assistance in determining survey objectives, questionnaire design, data base development and final report content will be provided. The consultant will be responsible for all other aspects of the project.

D. Work Program

Each of the major surveys -- local bus, interstate bus and rail -- will require the following tasks:

Task 1 - Development of Survey Objectives

A review of existing local bus, interstate bus and rail travel and demographic data will be conducted. All past passenger surveys, passenger on-off counts, and revenue data will be analyzed to assist in designing the questionnaire and the survey sampling plans. The review will also include an investigation of the Metropolitan Planning Agency regional travel survey and recent Port Authority survey efforts. Finally, key staff at NJ TRANSIT will be interviewed to determine their data requirements from these surveys. After evaluating this information, the objectives of the survey will be defined jointly by the consultant and the Steering Committee for this project.

Task 2 - Development of Data Collection Methodology and Survey Instrument

The objectives defined in Task 1 will be applied to develop a research plan. Various data collection methodologies will be examined and tested to find the most effective means to survey local bus, interstate bus and rail patrons. There are many possible approaches for the collection of travel data. Many of these are a function of type of data required. A cost-benefit analysis for each category of information desired will be performed to assess the cost-effectiveness of each product and will assist in the determination of the final scope and size of the survey. The product of this task will be a recommended survey methodology based on cost-effectiveness and consultation with the Steering Committee.

After evaluating various methodologies, a survey instrument will be designed and a data collection approach developed to address the objectives of the project and maximize the response rate. Questions will likely include, but not be limited to, many of the following items:

Trip origin
Trip destination
Frequency of travel
Trip purpose
Access mode
Egress mode
Transfers
Fare paid
Ticket type
Time of travel
Day of week of travel
Frequency of Use
When did use of mode begin?
What was the reason to choose transit?
Income
Auto ownership
Age
Sex

Attachment #4 includes several examples of previous surveys used by NJ TRANSIT and the Port Authority for origin/destination surveys.

Task 3 - Pre-Tests of Survey Instruments

Pre-tests of the questionnaires and data collection methodologies for each mode will be conducted to evaluate the comprehensibility of the questionnaire, to estimate the response rate, and to identify and correct any problems with the data collection approaches prior to full implementation.

Task 4 - Data Collection

Plans for field operations will be determined for the method of data collection chosen for each mode. The consultant will administer and field the survey instruments with appropriate quality controls in place to ensure adequate survey returns.

Task 5 - Data Validation, Coding and Data Entry

The data on the individual questionnaires will be prepared for mechanical processing. Two distinct steps will be taken: editing and coding. Editing will detect and eliminate errors through the inspection, correction and modification of information submitted on questionnaires. Coding will assign geographic and other open-ended responses to categories for processing. The Port Authority 5-digit coding system will be the basis for geographical coding. This essentially assigns each municipality in New Jersey a unique code, and establishes a more detailed zone system for New York City as well as Newark, Jersey City and some other parts of Hudson County. In addition to the place coding to the Port

Authority 5 digit system, the consultant will also be responsible for place name data entry for later GIS coding. Data from the survey will be keypunched and verified to insure quality control.

Task 6 - Weighting of Survey Data and Analysis

The data gathered from the survey will weighted based on ridership counts provided by NJ TRANSIT and the Port Authority. The final data base will be analyzed using various statistical techniques. Tabulations and cross-tabulations of each question will be produced. Trip tables and rider profiles will also be generated.

Task 7 - Data Base Installation and Training

A full copy of the survey data base will be installed on NJ TRANSIT IBM-pc compatible equipment for future analysis and use in analyzing ridership patterns, comparing the results with the 1990 Census, and comparing the current data with prior surveys. Software for this data base and analysis will be chosen by the Steering Committee in consultation with the consultant. Training will be provided in the use of the data and appropriate software.

Task 8 - Final Report

A final report will be written including an Executive Summary, an overview of each of the project tasks, and a detailed analysis of the findings. Technical appendices will include reports on the tabulations and cross-tabulations of the survey data. At least six copies will be provided for review and UMTA approval. Upon approval, a final report will be submitted.

E. List of Deliverables

NJ TRANSIT expects the following products from the consultant:

1. A technical memorandum on the objectives for the local bus, interstate bus and rail surveys.

2. A technical report discussing the sample design, methodology, and technical response rate for each survey.

3. Fully developed and pre-tested questionnaires

4. Completed, coded and verified questionnaires.

5. Detailed statistical tabulations and cross-tabulations of the responses to the questionnaire for each study.

6. An IBM-pc machine-readable copy of the entire data base in a format to be agreed upon by NJ TRANSIT after consultation with the consultant for

future use by NJ TRANSIT. This should include full documentation of all files and their structures, including a flow chart, and application procedures.

7. Training and a user's manual for use of the data base.

8. Technical memoranda outlining the work completed on each task for each study.

9. Draft and final reports for each study.

10. A "working" presentation prior to a formal presentation to management for each study.

11. A formal presentation to management on the results.

F. Anticipated Schedule

The following schedule is presented for proposal preparation and represents NJ TRANSIT's commitment to expedite this procurement and to complete the project:

ITEM	DATE
Request for Proposal Issued	March 8, 1990
Pre-Proposal Conference	March 19, 1990
Receipt of Proposals	March 29, 1990
Oral Presentations	April 5, 1990
Selection of Firm	April 12, 1990
Award of Contract	April 19, 1990

The Local Bus portion of this project is subject to restrictive time constraints compared to the balance of the project. As a result, the schedules for the Local Bus survey are identified distinctly from the interstate bus and rail portions of the project.

Local Bus Survey Schedule

Task 1	April-May, 1990
Task 2	May, 1990
Task 3	May, 1990
Task 4	May 28 - July 27, 1990
Task 5	July 9 - August 10, 1990
Task 6	August 13 - August 31, 1990
Task 7	August 20 - September 7, 1990
Task 8	September 29, 1990

The Interstate Bus and Rail portions of the project have a longer time horizon than the Local Bus survey.

Interstate Bus and Rail Survey Work Plan

Task 1	April 30, 1990
Task 2	By July 31, 1990
Task 3	By August 31, 1990
Task 4	September - December, 1990
Task 5	December 1990 - January 1991
Task 6	January - February 1991
Task 7	February - March 1991
Task 8	June 1991

G. Technical Proposal Format

1. Describe your understanding of the project and the issues to be addressed in the research.

2. State your data collection approach(es) and recommended sample sizes for each survey. Discuss and justify your approach and sampling plan. In particular, one part of the proposal should be devoted to a discussion of the potential problems involved in surveying local bus market areas and what mitigating strategies you may employ.

3. State the specific tasks in your proposed work program for completing the study.

4. Describe the anticipated trip tables to be produced, the output and any other final data from the research. Be as specific as possible.

5. Discuss the limitations of the current work program as outlined by NJ TRANSIT and what next steps or plans your firm recommends be taken in the future to maintain the data and tools produced in this study.

6. State the qualifications, experience, and knowledge of the individuals to be assigned to this study, specifically relating to transit survey research. Highlight any research conducted on local bus riders.

7. State your firm's experience in performing similar engagements with specific references.

8. State your potential conflicts with the technical or time requirements outlined in this project.

H. Cost Proposal (to be submitted under separate cover from Technical Proposal)

1. Provide a schedule of hourly rates for each person to be assigned to the study.

2. State your fee for performing the study. Your fee schedule should include hourly rates and estimated hours for each person to be assigned to the studies estimated out-of-pocket costs and the resulting all-inclusive fee for the project. The fee schedule should also include a cost breakdown for the tasks presented in your proposal.

I. Evaluation Criteria

1. Written Technical Proposal Evaluation:

Technical proposals will count for 70% of the overall rating. Proposals will be evaluated on the following criteria.

10% Technical understanding of the work to be performed, the issues to be addressed, and approach to generating solutions to potential research problems.

30% Methodological approach to project.

15% Qualifications of individuals assigned to project.

10% Experience of firm.

2. Oral Presentation Evaluation:

Oral proposals represent 30% of the overall rating of the consultant. Oral proposals will be evaluated on the following criteria:

201% Sense of mission:

1. Grasp of crucial issues.

2. Rationale presented for design and methodological recommendations.

3. Discussion of anticipated products.

5% Quality of presentation

ATTACHMENT #1
DEMOGRAPHIC PROFILE OF NJ TRANSIT RIDERS

	LOCAL BUS	INTERSTATE BUS	RAIL
Age			
Under 18	1.1%	0.7%	0.0%
18-24	12.2	4.4	9.4
25-34	19.8	27.2	36.1
35-44	21.5	23.5	25.0
45-54	19.4	17.7	18.9
55-61	15.1	16.2	6.7
62-64	4.2	6.6	1.7
65 +	6.7	3.7	2.2
	100.0%	100.0%	100.0%
Sex			
Male	33.6%	61.0%	68.7%
Female	66.4	39.0	31.3
	100.0%	100.0%	100.0%
Household Income			
Under $15,000	24.1%	1.6%	0.6%
$15,000-$24,999	29.9	10.4	4.4
$25,000-$34,999	17.8	13.6	11.3
$35,000-$49,999	14.7	27.2	20.1
$50,000-$74,999	10.1	30.4	34.6
$75,000-$99,999	2.3	10.4	15.8
$100,000 and over	1.1	6.4	13.2
	100.0%	100.0%	100.0%
Auto Ownership			
Autoless	43.3%	9.8%	5.0%
1 Auto	35.0	45.2	31.2
2 Autos	16.7	34.3	45.3
3 Autos	5.0	10.7	18.5
	100.0%	100.0%	100.0%

ATTACHMENT #2

NJ TRANSIT
FY 1989 ANNUAL BUS RIDERSHIP
BY ROUTE

ATTACHMENT #3

NJ TRANSIT RAIL RIDERSHIP
AVERAGE DAILY RIDERS BY TRAIN

ATTACHMENT #4

FORMER NJ TRANSIT SURVEYS

EXHIBIT A

PORT AUTHORITY SURVEY PLANS

The Port Authority of New York and New Jersey will be conducting Origin/Destination surveys of Trans-Hudson PATH and bus passenger who are not patrons of NJ TRANSIT. Since the questionnaires, the time frame and some of the facilities will be exactly the same as the NJ TRANSIT survey, it may be more efficient to do the survey work as a combined effort.

Interstate Bus Passengers -- Non NJ TRANSIT

The vast majority of NJ-NY interstate bus services terminate at either the Port Authority Bus terminal in midtown Manhattan or the George Washington Bridge bus station in upper Manhattan. In the past, the Port Authority has done bus passenger surveys art these two facilities that included both NJ TRANSIT services and private bus company services. The survey process is the same regardless of the service. **Exhibit B** is a listing of the size of bus patronage for NJ TRANSIT and the private carriers at each of the two terminals.

PATH Passengers

The PATH rail transit system has thirteen stations. Seven stations are in New Jersey and six in Manhattan. Of the seven New Jersey stations, only two have NJ TRANSIT rail passenger transfers: Newark and Hoboken. In surveying the PATH passengers, those passengers who transfer from NJ TRANSIT Rail will be surveyed in the NJ TRANSIT rail survey. Those who do not transfer will be surveyed at the PATH stations. The isolation of non-rail transfer passengers at the Hoboken station is relatively simple. The Newark station is more complicated, but the Port Authority staff will assist in developing a plan to accomplish this. The questionnaires will be parallel to those used for the NJ TRANSIT Rail survey.

The Port Authority completed a survey of off-peak PATH passengers in 1989 so that the survey of PATH passengers to accompany the NJ TRANSIT Rail passenger survey in 1990 will only include surveying the local PATH passengers in the peak hours (6-10 a.m.). **Exhibit C** is a list of passenger counts at all PATH stations in the Fall of 1989. Current passenger traffic is comparable. Both Newark station and the Hoboken station have about 75% rail transfer passengers in the peak hours.

Cost and Payment

If the respondents to NJ TRANSIT's RFP wish to include consideration of the prescribed Port Authority work, a separate cost estimate should be provided. Since the Port Authority had done these survey efforts before, the Port Authority will assign staff to design the survey instruments and procedures. Therefore, the work for the Port Authority will not include all the tasks described in Tasks 1 through 8 of the NJ

TRANSIT RFP. It would only include Tasks 3 through 5 plus survey weighting, some sample tabulations, provision of weighted data tapes and a report describing actual methodology.

Separate costs estimates should be provided for the PATH survey and the Bus survey, and should include costs for each of the tasks. The contract for these services will be directly with the Port Authority of New York and New Jersey.

As added information, **Exhibit D** describes the method used by the Port Authority for past surveys of this type.

Selection of Contractor

The selection of a data collection/data processing contractor to perform the Port Authority's scope of work will be based on cost competitiveness, reliable data, and level of resources sufficient to ensure effective coordination with NJ TRANSIT. If necessary, the Port Authority reserves the right to select a contractor other than the successful NJ TRANSIT bidder.

EXHIBIT B

PORT AUTHORITY BUS TERMINAL
SHORT AND MEDIUM HAUL CARRIERS
BUS AND PASSENGER DEPARTURES

SPRING 1989

EXHIBIT B

GEORGE WASHINGTON BRIDGE BUS STATION
BUS AND PASSENGER DEPARTURES

FALL 1988

NJ TRANSIT = 60% OF TOTAL

EXHIBIT C

SUMMARY OF TURNSTILE READINGS AT PATH STATIONS BY SELECT TIME GROUPINGS

ENTRANCE COUNTS

FALL 1989

EXHIBIT D

PORT AUTHORITY SURVEY METHODOLOGY

PATH Survey - Non-rail transfer passengers

Field Survey Method

In the past surveys conducted by Port Authority staff questionnaires were handed to all passengers entering each station. It is intended that a similar process and questionnaire (sample Attachment 4) will be used. The completed questionnaires are collected in marked boxes at each exit station.

The questionnaires are printed on heavy enough stock to be written on during the PATH trip. The questionnaires are numbered for control. Survey agents record the number series handed out on a time log. The logs are maintained at 15 minutes intervals. Survey agents are supplied to collect the questionnaires from the boxes at station exits. The questionnaires have a return address for mail back, but experience indicates that most are returned in the collection boxes.

Returned questionnaires are sorted, edited to determine a usable questionnaire and counted immediately after the field work in order to determine the adequacy of sample size. Resurveying in some areas may be necessary.

Additional survey agents may be required to record the turnstiles counts at the time of the survey. Port Authority staff may or may not be available for this function.

Data Processing

All usable returned questionnaires are coded and key punched for processing with an established coding system. Key punching is verified. With regard to location coding, the response as appears on the questionnaire will be punched in and a five digit Port Authority code will be determined and coded. The former is required for future TIGER file or GIS coding or for Port Authority five digit batch machine coding if an acceptable method is derived.

Survey responses are expanded to the universe as determined by the turnstile in and out counts. The calibration process will require that impact from the NJ TRANSIT rail survey of rail transfer patrons be included in this process. Therefore, it may be necessary to calibrate and weight the rail survey first so that the data representing Newark and Hoboken rail transfers can be included in the PATH calibration. The Port Authority staff and NJ TRANSIT staffs verify this calibration process.

Preliminary summary tabulations are prepared and reviewed by Port Authority staff before final weighing established.

Deliverables

Mainframe tapes and PC disks with the weighted survey data are to be provided. These will include the NJ TRANSIT rail transfer to PATH trips and the local PATH trips. The data must be compatible with the data from the remainder of the NJ TRANSIT rail survey, so that the files can be merged.

A limited number of tabulations and cross tabulations of the final weighted survey data will be provided along with a description of the survey methodology, sample sizes, coding process and calibrating and weighing process.

Interstate Bus Passengers - Non-NJ TRANSIT

Previous all day surveys of interstate bus passengers have included bus departures between the hours of 6:00 AM and 11:00 PM.

Field Survey Method

The method used for these surveys in the past has been to hand out questionnaires to patrons boarding all the westbound buses at the platforms in the terminals. Because of the crowding during peak hours, questionnaires are distributed at the stairways and escalator entrances to the platforms. Questions on the questionnaire referring to the other part of the riders' round trip allow the survey data to be "flipped" to depict an eastbound pattern to be comparable to the data to be derived from other modal surveys.

The questionnaires are printed on heavy stock to allow them to be completed on the bus. There are boxes on the bus to collect the completed questionnaires.

Master time and bus route schedules are available to determine which bus routes and how many bus departures are expected at designated platforms.

For survey control, the questionnaires are numbered and the field survey agents keep a log of what numbers are handed out at what bus or platform and at what time. The agents also get a count of total bus passengers on each bus by company and route number from the drivers or from the dispatchers on the platforms.

Survey agents must be available to retrieve the boxes within the day of the survey. Arrangements should be made with bus company personnel to assist in collecting the boxes with completed questionnaires at the end of the bus trip.

Preliminary sorts, editing and counts for usable questionnaires are made immediately after the field work to determine if sufficient responses have been received. Resurveys may be necessary.

Data Processing

All usable returned questionnaires are coded and keypunched for processing with an established coding system. Keypunching is verified. With regard to location coding, the response as appears on the questionnaire are punched and a five digit Port Authority code is determined and coded. The direct data entry is required for future TIGER file or GIS processing or for Port Authority five digit batch machine coding if an acceptable method is available.

Survey responses are expanded to the full universe using the bus passenger counts made at the time of the survey or other counts supplied by the Port Authority. To completely calibrate these bus surveys, the "flipping" process must be examined, i.e., the reverse trip questions must be processed to determine if there is a reasonable match to the eastbound trip volumes. The Port Authority and NJ TRANSIT staffs verify this process.

Preliminary summary tabulations are prepared and reviewed by Port Authority staff before final weighting is established.

Deliverables

Mainframe tapes and PC disks with the weighted survey data are to be provided. The data must be compatible with the data generated from the NJ TRANSIT interstate bus survey so that the files can be merged.

A limited number of tabulations and cross-tabulations of the final weighted data are provided, along with a description of the survey methodology, sample sizes, coding processes and calibration and weighting processes.

New York City Transit Authority, 1995

ATTACHMENT 1
SCOPE OF WORK

PROJECT IDENTIFICATION

New York City Transit Authority Bus Passenger Origin-Destination Survey

PROJECT PURPOSE

Introduction and Project Background

This Request for Proposal (RFP) requests the services of a Consultant to perform an on-board survey of riders on fixed bus routes operated by the New York City Transit Authority (NYCTA) or subsidized by the New York City Department of Transportation (NYCDOT). The purpose of this project is to provide route level data on the travel patterns of NYCTA and NYCDOT bus passengers. This project will provide the NYCTA and NYCDOT with a database of origin-destination trip patterns, system utilization characteristics, transfer patterns between subway and bus routes and rider demographics. This survey will include weekday travel with potential coverage of Saturday and Sunday bus travel.

While a variety of route-level origin-destination (O-D) surveys and attitudinal surveys have been performed over the years, this project would be the first systemwide O-D bus passenger survey conducted since the Borough-level "Sufficiency Studies of the late 1970s and early 1980s. The need for a new O-D survey was highlighted in the *Bus Service Strategy and Facility Development Plan* (June 1993). That initiative identified eleven specific areas of opportunity for the NYCTA to direct its efforts to stabilize a historical decline in bus ridership. One of those areas called for "...initiation of well structured market research and origin and destination studies will enable the Authority to focus service initiatives in areas that match current and potential customer priorities (page 11)". Successful completion of this survey will fulfill this important objective.

Conducting this survey will provide baseline information for comparison with future origin-destination surveys. As our bus survey proceeds, the New York Metropolitan Transportation Council (NYMTC) is conducting a regional household telephone survey; the schedule calls for a pre-test in Fall 1994 and conduct of the full survey in Spring 1995. Coordination of the type and format of questions asked in both surveys will facilitate their combined use for future planning and travel forecasting applications. The NYMTC survey will provide information about market share throughout the region and the differences in travel patterns between transit users and non-users. The survey called for in this RFP will provide bus route level origin-destination pattern data which would be unavailable in the NYMTC survey (subway passenger origin-destination data was provided by the 1990 Subway Survey).

Project Objectives

The objective of this project is to successfully carry out a bus passenger O-D survey of all NYCTA and NYCDOT bus routes, with distribution and collection of survey forms carried out in September-December 8, 1995 and March through Memorial Day weekend 1996. The intervening winter break in data collection has been scheduled for coding and verifying results received so far, make any mid-course corrections (e.g., re-sample a route if necessary in Spring 1996), and avoid holiday seasons and inclement weather. Completion of this survey will provide the first city-wide travel and demographic database of bus travel since the early 1980s. This database will be the first such inventory collected over a short period of time. Anticipated applications of this data include at a minimum:

- Developing a comprehensive knowledge of bus passenger characteristics and patterns as they relate to the NYCTA's current level of service--at the route, corridor, borough and city-wide level;
- Providing a systematic basis for analyzing the need for future or enhanced transit facilities or intermodal terminals and/or service modifications (e.g., increased service, through-routing, new limited stop routes, route extensions to business districts, priority bus lane treatments); and
- Providing data for calibrating and validating a bus corridor ridership model.

As part of this project, the NYCTA seeks the following Consultant services:

- Identifying required data elements, anticipated departmental applications for the use of on-board survey data;
- Formal review of previous on-board bus survey methodologies, including methods of controlling anticipated survey response bias;
- Sample design and survey instruments;
- Hiring, training, and supervision of survey workers;
- Pilot study of the appropriateness of the sampling plan, survey instrument, survey worker logistics, as well as distribution, collection, and survey coding procedures;
- Administration of the full survey;
- Data entry and geo-coding of results, logic-checking and correction of data fields;
- Weighting and expansion of sample rider survey results; and
- Final report containing empirical and statistical analysis at the route, service-type and system-wide levels;
- Delivery of datasets in at least two formats, selecting from ASCII, ORACLE/PC or IBM mainframe, SAS/PC or IBM mainframe formats, or other format(s) designated by the Project Manager.

Sample Design Issues

The sampling frame for this project consists of scheduled bus trips on all bus routes comprising the fixed route bus system operated by the NYCTA and NYCDOT in weekday service. These routes include four types of bus service:

- NYCTA local bus routes;
- NYCTA limited stop bus routes;
- NYCTA express bus routes; and
- Local and express franchised routes subsidized by the NYCDOT.

Each RFP package includes bus maps for each of the five boroughs showing all NYCTA and NYCDOT subsidized franchise routes. The accompanying *Technical Appendices* contain a map showing NYCDOT subsidized express bus routes. The *Technical Appendices* also show the allocation of bus routes to depots, passenger boardings derived from farebox revenue, individual bus route frequencies and summarizes the number of one-way bus trips and travel times by time period and day type (weekday, Saturday and Sunday), both for NYCTA and NYCDOT routes.

The NYCTA's bus system carries approximately 1.6 million linked passenger trips per day on 202 local and 30 express bus routes. Over 3,600 peak buses are operated out of 19 depots. Approximately 46,000 trips are operated each weekday. This RFP packet includes a bus map showing the routes and frequencies of service operated in each borough. All routes are identified by an alphabetic prefix followed by numbers. Routes with an "M" prefix extensively operate in Manhattan. "B" stands for Brooklyn, "Bx" for the Bronx, "Q" for Queens, and "S" for Staten Island. Routes with an "X" prefix are for express buses. Routes which operate limited stop service (i.e., stopping only at major bus or subway transfer points) are shown on the back of each map and designated with the suffix "LTD").

NYCDOT subsidizes local and express franchised bus services operated by seven carriers:

- Command Bus
- Green Bus Lines
- Jamaica Buses
- Liberty Lines Express
- New York Bus Service
- Queens Surface
- Triboro Coach

In addition, Manhattan-bound express bus service is operated by these franchised carriers from the Bronx, Queens and Brooklyn. The above carriers also offer limited local service in Bronx and Brooklyn and an extensive network of service within Queens. Local routes are shown on the NYCTA borough bus maps included in this RFP. Approximately 9,800 weekday bus trips are operated.

Separate sampling plans shall be developed for weekday, and optionally for Saturday and Sunday travel. The sample size for this project needs to be large enough to provide adequate samples by route, direction of travel, and time of day as shown in the *Technical Appendices*. Limited stop trips of local routes (i.e., as encountered on NYCTA routes M15 and B41) shall be treated by the Consultant as *separate* routes. The distribution of sample route branches and short-turn trips within bus trips of the same route shall reflect the distribution of all bus trips on that route. Sample sizes capable of estimating sample proportions of questionnaire variables within a +/-10% margin of error at the 95% level of confidence by route/direction/time-period combination shall be identified in all proposals. Proposers shall employ appropriate methods or assumptions for certain sample size inputs (e.g., distribution of passengers

on a particular bus route by time-of-day) where data have not been supplied in the *Technical Appendices*. Five time periods have been defined for this project:

- AM peak: 5 AM to 10 AM;
- Midday: 10 AM to 3 PM;
- PM peak: 3 PM to 7 PM;
- Evening: 7 PM to 11 PM; and
- Nights: 11 PM to 5 AM.

These times are based on the time at which the passenger boards a vehicle. The time of passenger boarding shall be recorded. Four time periods shall be used for Saturday and Sunday surveys:

- AM: 5 AM to 10 AM;
- Midday: 10 AM to 7 PM;
- PM: 7 PM to 11 PM;
- Nights: 11 PM to 5 AM.

During the project initiation phase of this project, the NYCTA and NYCDOT shall provide the selected consultant with the necessary information regarding the fixed-route system. Included will be information such as bus schedules, the latest route map and bus pullout information. When and where necessary, the NYCTA and NYCDOT shall provide a means of access to the system for survey personnel during the survey administration process.

Project Organization

Keith J. Hom, Director of Strategic Planning/Office of Management and Budget, will serve as Project Director and will provide overall direction and supervision for this study effort. Robert Newhouser, Deputy Director--Transportation Planning Analysis/Office of Management and Budget, will serve as Project Manager, and will provide day-to-day coordination of the project.

All project products shall be reviewed by the Bus Origin-Destination (O-D) Survey Review Committee. This committee shall provide advice and comments on all aspects of this survey, and includes representatives of the Department of Buses, Customer Services, Operations Support departments and the Office of Management and Budget as well as the Metropolitan Transportation Authority, the New York Metropolitan Transportation Council, and NYCDOT.

In addition, all products produced by the Consultant selected for this project shall be reviewed by an independent consultant retained by the Committee. The independent consultant shall provide guidance on whether work products produced during the course of this survey maintain the high standards of statistical validity and accuracy necessary for successful completion of this survey.

Based on the comments and advice of the Committee, the Project Director shall be responsible for granting final approval in writing for all deliverables submitted by the Consultant.

Firms may respond both to this RFP and the RFP for the independent oversight of the actual bus survey. However, the consultant selected in response to this RFP may not also be awarded the contract for conducting the independent oversight of the bus passenger survey.

Consultant Requirements

The Consultant shall be required to:

- Designate a single individual as the Consultant's project manager to serve as the principal point of contact with all NYCTA and NYCDOT staff, including the NYCTA's Project Manager;

- Maintain a working relationship with the NYCTA's Project Manager (hereinafter referred to as the Project Manager), who shall be a contributing member of the project team and shall be kept informed about and have input into all stages of the planning process.

- Attend meetings of the Bus O-D Survey Review Committee when requested by the Project Manager. This committee is expected to meet at the NYCTA offices on 130 Livingston St. in Downtown Brooklyn, NY on at least a monthly basis for the length of the Project as required and determined by the Project Manager. The Consultant is not required to be present at all meetings, only those requested by the Project Manager. Committee meetings shall be 1.5 hours in length on average. Proposals submitted shall indicate the significant points in the project requiring meetings with the Project Manager and/or the Bus O-D Survey Review Committee. The Consultant shall be responsible for the preparation of meeting summaries for meetings in which they are in attendance.

- Prepare and submit 20 copies of all products in a preliminary form subject to a 15 working day NYCTA and NYCDOT review, except for the draft final report, which shall be subject to a 30 working day review, and may be subject to additional review by other agencies, including the Federal Transit Administration (FTA).

- Complete revisions made during the above review no later than 15 working days following receipt of written comments from the Project Manager.

- Prepare and present at least one formal presentation, to senior NYCTA and MTA management at the completion of this Project, outlining work accomplished, conclusions, and areas of future work.

- Attend other meetings with management, NYCTA employees or advisory group on an occasional basis, as directed by the Project Manager.

- Ensure that any procedures developed and carried out during the course of this Project comply with the provisions of the Americans with Disabilities Act of 1990 (ADA).

- Provide data and documentation requested by the independent consultant retained for this project to review all work products produced .

All data and analyses developed by the Consultant shall be provided to the NYCTA in electronic media form in addition to "hard" (printed) copy, throughout the course of this Project. This shall include, but not be limited to spreadsheets and databases describing the transportation services therein. This data shall be provided in a format readable by software packages in use at the MTA and the NYCTA on 3 and 1/2" floppy diskettes. Other large capacity input/output devices which have been demonstrated to be compatible with NYCTA personal computer equipment (e.g., Bernoulli disk drives, cartridge tape drives, etc.) may be used to transfer data with the written consent of the Project Manager. The NYCTA currently uses SAS (IBM 3090 mainframe version) and SAS/PC for statistical analyses, Microsoft Excel 5.0 (for

Windows) for spreadsheets, ORACLE (IBM mainframe and PC version), and TransCAD software for transportation network and GIS displays and analyses. Dial-up access to NYCTA personal computers is not available at this time. At the conclusion of this Project, final text and documentation shall be provided in electronic form which can be read by Microsoft Word 6.0 for Windows.

Prior and Concurrent Studies

The Consultant shall develop and implement this on-board bus passenger survey, building upon and improving on the type and format of questions posed in other New York City area transportation surveys carried out over the last five years. These surveys include:

- 1989 MTA Comprehensive Telephone Travel Survey, a telephone survey of 20,000 households in the MTA service area which elicited a one-day travel diary of the person answering the phone (see Market Opinion Research, *A Methodology Report on the Comprehensive Travel Telephone Survey*, 1990).

- 1990 Subway Survey, surveys of subway passengers entering all 469 stations of the subway system from 5 AM to 10:30 PM (see Urbitran Associates, *1990 Subway Trip Survey*, 1992).

- 1992 Fare Policy Survey, a survey of approximately 6,000 households relative to their daily travel habits and attitudes toward different bus-subway fare options after installation of the AFC system. (see Caliper Corp., *Fare Policy Study*: *Phase I Telephone Survey--Draft Report*, undated).

- Comprehensive Community Planning Studies, conducted by the NYCTA's Operations Planning Dept. Studies have been completed in the Northeast Bronx (1993) and Southwest Brooklyn (1994). Both studies incorporated telephone surveys of area residents to document major travel patterns, trip purposes, and mode of travel (see Intersearch Corporation of New York, *NYCTA Comprehensive Community Service Planning Study (Northeast Bronx Study Area)*, 1994 or Schulman, Ronca & Bucuvalas, Inc., *The Southwest Brooklyn Comprehensive Community Planning Study Market Research Topline Report*, 1994).

- 1990 Census Transportation Planning Package, with "Journey-to-Work" data derived from the 1990 Census "long form".

- 1992 survey of Staten Island Ferry customers;

- Annual Market Research surveys of customer attitudes, demographics, and trip frequencies, including start-up of a panel survey later this year.

- Route-specific origin-destination on-board surveys (mail-backs or interviews) conducted between 1987 and 1993.

The Consultant shall design the survey instrument for this bus passenger survey, recognizing that comparisons with the surveys listed above may be needed in the future for comparison purposes.

The Consultant shall be made aware of progress on NYMTC's ongoing household telephone interview survey, to be conducted in the Fall 1994/Spring 1995 time period. NYMTC staff participates on the Bus O-D Survey Review Committee to ensure maximum coordination in selecting the type of questions asked in both surveys as well as the method of coding responses. In the event that the Consultant initiates contacts with NYMTC regarding their survey, the Project Manager shall be present at, or made aware of, all such contacts.

WORK PROGRAM

The following details the tasks to be conducted during this project. The Consultant shall develop the sample design; survey instrument(s) and procedures; draw the sample bus trips, conduct a pilot study and pre-test of the questionnaire(s); conduct the full survey; code and verify all data fields; geo-code origins and destinations; provide clean and complete databases and prepare final reports.

The proposal shall describe how each of the following tasks will be accomplished. The proposer may respond using the prescribed outline below, or an alternate format, provided that all tasks are thoroughly addressed and the Selection Committee can directly identify the costs and products of the various activities. Levels of effort, costs and assessment of accuracy and data uses by tasks shall clearly allow evaluation of the trade-offs of conducting:

- Weekday, Saturday, and Sunday surveys versus weekday-only surveys;
- Combined NYCTA and NYCDOT surveys versus NYCTA surveys alone; and
- Use of English and Spanish language surveys only, versus use of additional language(s).

Task A - Establish Goals, Objectives, and Applications

Objectives:

1. Develop project work plan.
2. Develop final set of project goals, objectives, and ultimate applications of survey data.

Description:

The Project Manager shall schedule a kick-off meeting with both the Survey O-D Review Committee and the Consultant within four weeks after the receipt of the "Notice To Proceed". The agenda for the kick-off meeting shall include, but not be limited to:

- Introduction of Consultant's personnel assigned to this project

- A presentation detailing the Consultant's work plan which contains the:

  Approach: A description of the Consultant's approach to work shall include the Consultant's perception of his/her role and the relationship of that role to the NYCTA role.

  Task Description: The steps to be followed in carrying out the work, broken into a level of detail indicating tasks and sub-tasks, reflecting a clear understanding of the work and proposed approach.

  Deliverables: A listing of all deliverables, including a description of medium, format, content, and level of detail which can be expected with each deliverable.

  Schedule: Schedule of work tasks showing expected sequence and length of each, including a preliminary schedule for presentations and progress reports to the Committee.

- The Consultant shall demonstrate that the project can be completed accurately, with all appropriate survey controls, in the time allotted and within the budget for this contract.

The Consultant shall meet with representatives of the Bus O-D Survey Review Committee to define anticipated uses of the survey data collected by department, based on the goals and objectives established by the Committee earlier in the project. For each goal and objective, one or more data items shall be identified for collection, along with anticipated application and user department. The data items selected shall be ranked by priority, recognizing that a longer survey is more expensive to collect and code, and may yield a lower response rate. In responding to this task in proposal submissions, proposers shall discuss some of the key anticipated goals, objectives and corresponding data items relevant to conducting an on-board bus survey in this service area.

This review of data applications shall, at a minimum, cover areas such as transit service planning, scheduling, marketing, travel forecasting, and system monitoring. Opportunities for the O-D survey data to reinforce ongoing planning, marketing, and traffic counting programs at MTA, NYCTA, NYCDOT, and NYMTC shall also be addressed. The results of these departmental meetings shall be documented in a table which clearly identifies each data item to be collected in the O-D survey and the anticipated uses of that data by department.

Note that the purpose of this task is to refine and reaffirm for the Bus O-D Survey Review Committee, the scope of work agreed upon at the time of contract signing to incorporate the project's goals, objectives and survey data items, tailored to the Consultant's specific approach, not to spur a fresh look at the scope of work. Significant Consultant level of effort in carrying out this task should not be scheduled.

Products:

Deliverable A.1: Detailed work plan
Deliverable A.2: Technical memo with goals, objectives, applications for each survey item

Task B - Develop Sampling Plan

Objectives:

1. Recommend the most appropriate sample size/sample plan for this project that meets the analytical objectives detailed in Task A.

2. Finalize sampling methodology based on staff review of Consultant's recommendation.

Description:

The Consultant shall determine sample sizes (i.e., returned surveys), utilizing a Base option and three alternative options:

- *Base option:* Weekday NYCTA and NYCDOT routes
- *Option A:* Weekday, Saturday and Sunday NYCTA and NYCDOT bus routes
- *Option B:* Weekday NYCTA routes only (no NYCDOT routes)
- *Option C:* Weekday, Saturday and Sunday NYCTA routes only (no NYCDOT routes)

Costs shall be developed under each of the foregoing options.

These options are requested because final decisions regarding inclusion of weekend surveys and NYCDOT bus routes are still pending; these will be resolved prior to issuance of this contract. Sample sizes for all bus routes shall be computed to within +/-10% margin of error at the 95% level of confidence for estimating sample proportions in the survey questionnaire by route, direction, and time-of-day. Sample sizes shall be developed separately by each of the foregoing options. Route-specific bus passenger boarding estimates, number of bus trips and travel time data by time period and direction for development of approximate sample sizes are contained in the *Technical Appendices*. The bus sample shall be sufficiently large to meet the above confidence limits for survey records stratified by time of day and direction for each bus route. Limited stop bus routes will be treated separately from their corresponding local route. The following time periods shall be used in the weekday sampling plan (Base option):

- AM peak: 5 AM to 10 AM;
- Midday: 10 AM to 3 PM;
- PM peak: 3 PM to 7 PM;
- Evening: 7 PM to 11 PM; and
- Nights: 11 PM to 5 AM.

Four time periods shall be used for Saturday and Sunday surveys (Options A and C):.

- AM: 5 AM to 10 AM;
- Midday: 10 AM to 7 PM;
- PM: 7 PM to 11 PM;
- Nights: 11 PM to 5 AM.

Ridership distribution by time-of-day is not systematically available for the bus routes to be surveyed. As a result, for the purposes of arriving at sample sizes, proposers shall make and document appropriate assumptions for allocating sample trips by time period based on the bus trip and ridership data supplied in the *Technical Appendices*.

For the purpose of faster and more efficient scheduling of survey crews, proposers may develop their sampling plan based on selection of trips on the same bus runs (i.e., one driver shift) or half-runs rather than solely on individual bus trips. If this method of sampling is proposed, discuss procedures needed, if any, to ensure that the results from this method of sampling are just as statistically reliable as randomly selecting individual bus trips. The sampling plan shall discuss the schedule for drawing the sample and scheduling sample trips. The plan shall ensure that adequate time is allocated to ensure that survey crews receive productive assignments. The *Technical Appendices* provide data pertinent to computing sample sizes.

The sampling plan developed shall:

- Clearly and succinctly define a bus passenger trip. For example, a bus passenger is surveyed in detail about his/her trip on the sampled bus, but at what point does a stopover at a transfer point to another bus or subway route break a longer trip into two distinct and separate trips? The basic sampling unit shall be clearly defined for data expansion under Task I.

- Allow for sample passenger trips to be expanded to both total passenger trips and total persons (i.e., one person may take several bus trips per week)

- Specify the assumed usable response rate and discuss the basis for this rate and sources of error or bias factored into it. The usable survey response rate is composed of the proportion of

surveys distributed which were actually returned, multiplied by the proportion deemed complete and usable.

- In the New York City context, discuss types of bus trips or strata where achieving the required sample size may be difficult. Identify specific strategies for minimizing the sources of error and bias likely to be encountered on NYCTA and NYCDOT services. Proposals submitted in response to this RFP shall discuss this issue in detail.

- Provide for a systematic means for replacing missed or incomplete survey trips.

- Identify systematic method for ensuring that a scheduled survey day is free of unusual events which could seriously disrupt bus service and typical origin-destination patterns (e.g., motorcades for visiting dignitaries in Manhattan, weather delays). The proposal shall identify appropriate sources of such data.

- Plans for tracking of survey origins and destinations independent of passenger information recorded on the survey (if necessary). For example, the Consultant may propose tests to validate bus stop origins and destination counts from survey forms to concurrent on-off bus stop counts on all routes or a sample of routes. The on-off counts may be recent counts or specially provided by the Consultant. *The Bus O-D Survey Review Committee has identified the ability to accurately capture and verify passenger origin-destination bus stop patterns for each sample stratum as a critical objective of this survey*.

To promote maximum compatibility with the NYCTA's point check program, routes operating along the same streets passing frequently used point check locations shall be surveyed on the same day to the extent that practical survey logistics allow. A technical memo accompanying the sampling plan shall discuss procedures for handling refusals and incomplete survey responses. This memo shall discuss the merit and method for recording observational information about each rider boarding a sample bus trip to expedite analysis of non-response bias. The Consultant shall provide the independent consultant with supplemental data and documentation, if any, necessary to review work products produced under this task.

Products:

Deliverable B.1: Sampling plan report for bus routes
Deliverable B.2: Memorandum documenting response rates, sources of survey bias.

Task C - Develop Survey Instruments

Objective:

Design and produce survey instrument(s)

Description:

The Consultant shall develop and submit the draft survey instrument designed to collect the information necessary to achieve the goals and objectives shown in Task A. Questions to be asked of the surveyed passenger shall include, but not necessarily be limited to the following items:

- Trip origin (allowing for reference by address, intersection, etc.)
- Trip destination (allowing for reference by address, intersection, etc.)
- Survey bus stop boarding location for one-way sampled bus trip

- Survey bus stop alighting location for one-way sampled bus trip
- Trip purpose
- Access mode
- Egress mode
- Listing of bus and subway routes used for the entire trip surveyed
- Fare paid and media type
- Time of travel (departure and arrival times)
- Frequency of making the survey trip
- Age
- Sex
- Race/ethnicity
- Auto ownership, availability of auto for survey trip
- Household income

Survey instrument design and/or technologies that enhance the efficient creation of the final databases are encouraged (e.g., "self-coding" surveys, surveys which can be entered into a database using scanners). Proposals shall discuss the pros and cons of conducting direct passenger interviews versus self-administered questionnaires, or other alternative, and recommend the preferred method. If self-administered questionnaires are employed, proposers shall discuss the pros and cons of allowing a mailback option versus collecting forms when passengers leave the survey bus. If a mailback option is selected, proposers shall discuss measures to verify the accuracy of origins and destinations recorded by survey respondents along a bus route. Significant concern has been expressed by Committee members relative to low response rates on previous self-administered NYCTA surveys (as low as 5% on some bus routes) and inaccurate passenger recording of origins and destinations.

The survey instrument shall be refined and finalized based on review by the Bus O-D Survey Review Committee. The Consultant shall translate the survey instrument into Spanish, the second most prevalent language spoken in New York City. Proposers shall discuss appropriate method(s) of verifying the accuracy of the questionnaire translation.

Many NYCTA routes serve significant number of riders speaking languages other than English and Spanish. Proposals shall outline approaches, including additional foreign language survey instruments or survey crew(s), which insure a representative sample, for promoting high levels of participation of riders speaking foreign languages. If additional foreign languages are included, the proposal shall carefully weigh the added cost and logistical complexity against the benefits in improved survey accuracy and public relations. While additional foreign language forms may be included, no more than five languages systemwide may be included in the survey (with English and Spanish comprising two of the five languages). The *Technical Appendices* contain 1990 Census data showing the distribution of foreign language speakers around New York City.

The Consultant shall provide the independent consultant with supplemental data and documentation, if any, necessary to review work products produced under this task.

Product:

Deliverable C.1: Draft Survey Instrument(s)

Task D - Establish Field Data Collection Procedures

Objective:

Develop survey data collection logistics to maximize number of usable survey responses

Description:

The Consultant shall develop and document field procedures to be used for this survey. This includes training, scripts, crew sizes, deployment, field supervision, handling of mail account and processing of mail-back forms and quality assurance efforts. These procedures shall be reviewed by the Project Manager and the Bus O-D Survey Review Committee prior to the pilot study. Proposers shall indicate unique aspects of their data collection program which promote high response rates and reliable data collection efforts, including:

- Compensation or incentives to promote high attendance and punctuality of survey workers;
- Compensation or incentives to minimize survey worker attrition following training
- Field supervision policies to minimize incorrect or false completion of survey packets.

The Consultant shall provide the independent consultant with supplemental data and documentation, if any, necessary to review work products produced under this task. Proposer shall supply all necessary field data collection personnel.

Product:

Deliverable D.1: Technical memorandum documenting field data collection procedures
Deliverable D.2: Survey instruction manuals and forms for recording survey distribution

Task E - Develop Publicity Plan

Objectives:

1. Market O-D survey goals to customers to encourage cooperation and high response rates by surveyed passengers.

2. Market O-D survey goals to bus operators and depot employees to promote their interest and cooperation in the project.

3. Recommend (but not implement) the type, value, and number of incentives to include in the survey to maximize bus passenger response rates.

Description:

The Consultant shall prepare a publicity plan for stimulating participation and interest in the on-board survey. The plan shall document experiences with survey publicity in other major on-board bus surveys, including techniques which were successful in maximizing respondent cooperation and those which did not. The publicity plan shall also sell the importance of this survey to depot employees and bus operators, with specialized programs as appropriate. The Consultant shall estimate the cost of producing the products in the publicity plan. Final publicity products from the Consultant's publicity plan shall be selected, prepared and distributed by NYCTA Customer Services/Marketing staff in consultation with the Project Manager. An effective publicity program started well in advance of the full survey is considered

critical to maximizing the cooperation and response rate by bus passengers on survey bus trips. NYCTA is interested in a cost-effective publicity program focused on maximizing survey passenger response rates, not in publicity for its own sake.

The selection and use of incentives is another critical factor to high levels of survey participation by bus riders. The Consultant shall recommend incentives to attract high participation levels as part of the Publicity Plan. These may range from automatic receipt of a free ride token for successfully completing a survey, use of open-ended "suggestions" block on questionnaire, to cash gifts or prizes awarded on a random basis. The Consultant shall briefly document experience elsewhere and then recommend and cost out an appropriate program, including the applicable logistics for administering the program. NYCTA shall assume final responsibility for implementation of any incentive program. The Consultant shall provide the independent consultant with supplemental data and documentation, if any, necessary to review work products produced under this task.

Products:

Deliverable E.1: Review of publicity programs for bus on-board surveys in other cities
Deliverable E.2: Publicity Plan for the NYCTA/NYCDOT Survey
Deliverable E.3: Recommended incentive program with costs.

Task F - Conduct Pilot Study/Pre-Test

Objectives:

- Test effectiveness of sample design, survey instrument, field data collection, and data entry procedures prior to implementation of the full survey.
- Make "go/no go" decision that results of the survey to date are satisfactory to proceed with conduct of the full survey, or cease all further activity.

Description:

The Consultant shall undertake a pilot survey to test the adequacy of the sample design, survey instrument, and the data collection and coding methodology. In particular, the survey instrument shall be pre-tested in the languages selected in Task C to determine the extent to which multiple foreign language surveys and/or survey crews increases response rates. Routes/trips selected shall include NYCDOT and NYCTA lines as well as routes with high and low proportions of student riders. Proposers' cost estimates shall assume use of an English and Spanish language survey in the Base cost option, with the cost of adding an additional foreign language(s), assuming that it is needed. The survey form used for the pre-test shall be approved by the Project Manager prior to field testing, and again prior to its use in the full survey under Task G.

The pilot study shall also evaluate the comprehensibility of the survey instrument, estimate the time to fill out the survey, the survey response rate, and identify and correct any problems with data collection and coding approaches prior to full implementation. At the conclusion of the pilot study, the Consultant shall submit a pilot test technical memorandum detailing the results of the pilot test and make recommendations, if any, on revisions to the instrument(s), sampling plan and Survey Instruction Manual based on pilot test results.

The Consultant shall meet with the Project Manager and the Bus O-D Survey Review Committee prior to initiating any final changes.

Products:

1. Deliverable F.1: Technical memorandum detailing results of pilot study
2. Deliverable F.2 (depends on F.1): Revised survey instrument(s)
3. Deliverable F.3 (depends on F.1): Revised sampling plan
4. Deliverable F.4 (depends on F.1): Revised survey instructions manual

Task G - Conduct Full Survey

Objective:

Administer on-board bus passenger survey in accordance with the previously approved survey design and field procedures.

Description:

The Consultant shall administer and field the on-board bus survey instruments with appropriate quality controls in place to ensure adequate survey returns. This task will be carried out between September and December 8, 1995 and the balance, between March and Memorial Day weekend 1996. Automated Fare Collection fareboxes will be installed during the survey, permitting for the first time, the use of free or discounted bus/subway transfers. Surveys must be conducted by borough **after** installation of these fareboxes to ensure that all passengers are surveyed based on availability of bus/subway transfers. To this end, boroughs shall be surveyed (both NYC Transit and NYCDOT routes) in the order shown below:

1. Staten Island (first) in the September-December 8, 1995 period
2. Queens (second) in the September-December 8, 1995 period
3. Brooklyn (third) in the September-December 8, 1995 period
4. Bronx (fourth) in the March-May 1996 period
5. Manhattan (fifth) in the March-May 1996 period

Where two or more bus routes operate over the same street over a length of at least two miles, the Consultant shall make every effort, where possible, to survey those routes on the same day, so the data collected can be combined with point check data tabulated for that route, and so that customers indifferent to a route on a corridor are not approached multiple times.

For each foreign language selected for the full survey, the Consultant shall provide personnel conversant, if not fluent in that language, to distribute the required survey instruments in areas with high incidence of the foreign language. The Consultant shall be responsible for all training of survey personnel.

The Consultant shall be responsible for ensuring adequate staffing and supervision of survey personnel in terms of absolute numbers of interviewers and also the appropriate placement of foreign language survey crew. Proposals shall discuss how this will be accomplished. Special attention shall be made to providing ample surveyors to cover especially high volume routes. All staffing and supervision shall focus on the goal of achieving the target sample sizes established in the sampling plan developed in Task B. Proposer shall supply all necessary field data collection personnel.

The Consultant shall be responsible for providing supervisory quality control and monitoring throughout the entire survey administration process to promote high levels of survey returns. Control mechanisms shall be established and approved by the Project Manager and the Bus O-D Survey Review Committee to ensure completion of surveyor assignments, review and monitoring of surveyors' performance and collection of survey instruments. During this stage of the survey, the Consultant shall review and validate completed surveys and report the results every week in the progress reports using a computerized management system described under Task K. Proposals shall discuss how the survey management plan will facilitate tracking of adherence to the established quality control plan.

The Consultant shall be responsible for arranging for secure hard copy or electronic storage of original or image copies of survey forms as filled out by passengers. Method(s) of accomplishing this shall be included in proposer responses.

Products:

1. Deliverable G.1: Completed copies and/or images of raw survey forms
2. Deliverable G.2: Survey crew assignments to bus routes
3. Deliverable G.3: Recommended revisions (if any) to survey instrument, sampling plan, crew instructions based on Fall 1995 coded results so far.

Task H - Conduct Survey Data Entry, Geo-coding and Verification

Objectives:

1. Develop coding manuals, forms entry, editing/logic checking, and reporting programs
2. Develop geo-coding software programs
3. Complete data entry, coding, and geo-coding of all surveys
4. Complete logic checking and correction of counterintuitive survey responses
5. Complete follow-up plan for handling surveys with incomplete data fields

Description:

Prior to the pilot study in Task F, the Consultant shall develop the necessary manuals and/or software programs to enter or scan in by scanner, code, verify, and conduct logic-checks on survey data. Procedures for entering, editing, logic-checking and geo-coding origins and destinations using an automated geographic information system (GIS) shall also be developed. Logic checks also include generation of estimated values for data fields on the "required completion" list for which no response was recorded as well as accounting for alternate names in some fields. Some bus routes are commonly referred to by street name, rather than their route numbers. All logic checks, coding and geo-coding conventions shall be documented in a technical memorandum and approved by the Project Manager prior to implementation. Proposals shall discuss critical data fields frequently experiencing missing/unacceptable values and identify possible correction procedure.

The Contractor shall begin data entry and geo-coding concurrent with conduct of the full bus survey (Task G). If manual data entry (e.g., instead of scanning) is employed, all data must be entered twice and cross-checked by computer. Concurrent data entry and geo-coding coupled with the detailed progress reporting of usable survey forms in Task K will permit early assessment and correction of possible coding problems. The Contractor shall review coded surveys to determine the validity and reasonableness of data provided. The Consultant shall discard surveys with obviously frivolous responses or irreconcilable travel information.

The Consultant shall attempt to code and verify every field filled out by a passenger. If survey data fields are incomplete or invalid, the following data fields must at a minimum be valid for the survey to be considered complete:

- Trip origin and destination address/location
- Trip frequency

The above requirement for a complete survey is a minimum. If additional fields have been entered by a passenger and are verified as valid, they must also be entered onto the survey database for the form to be considered complete.

Proposals shall indicate the plan for screening coded surveys for errors and invalid values. Proposals shall also provide the assumed time and cost for coding non-geographic data, geo-coding, and the error checking/correction function. The Consultant shall be responsible for ensuring that data entered onto computer files are not lost. Proposals shall specify backup procedures to preserve data integrity.

Once the surveys have been screened, the Consultant shall perform geo-coding of trip origins and destinations as the second step. The street address and building landmark file used for geo-coding shall be supplied through the Project Manager. This file will have been used for the Fall 1994 tri-state household telephone survey and is derived from the Census Tiger file. The Consultant shall implement geo-coding procedures that accept locations in at least three formats:

- Street number, street direction, street name, street type, including handling of four and five digit addresses (e.g., 134-24 175th St. in Queens);

- Cross-streets (e.g., East 40th St. at 2nd Ave.);

- Building landmarks (e.g., Empire State Building, Co-op City)

The Consultant shall be solely responsible for geo-coding the ultimate origin and destination of each survey trip as well as the boarding and alighting point on the survey bus. The location of transfer points on multiple vehicle trips are not to be geo-coded. Proposals shall discuss the quality control plan for verifying the accuracy of geo-coded data.

The Consultant shall be responsible for translating and/or correcting all survey origins and destinations to addresses which can be recognized by either the NYCTA's or NYMTC master address files derived from New York City's Lion/Tiger database. Origins and destinations shall be geo-coded to x-y coordinates on the GIS system to a level of accuracy deemed appropriate for route-level transit planning. Proposals shall state the assumed level of geo-coding accuracy, expected geo-coding success rate after the above corrections, and any assumptions used in the corresponding geo-coding cost proposal. The cost proposal shall separate out the cost of geo-coding versus the cost of coding all other survey data fields. In addition, the cost of geo-coding just the ultimate origin and destination (not bus stop boarding and alighting points) shall also be identified.

Proposals shall indicate the number of batches in which completed surveys will be delivered for review by the Project Manager. Using the data items specified in Task C, proposers shall specifically state the assumed minutes per survey record used in cost estimates. Week-by-week delivery of completed (data entry and verification completed) surveys is not expected; however, delivery of all surveys in a one batch near the project's conclusion is unacceptable. The survey batches shall be delivered as subsets of the final full database specified in Task J to facilitate earliest possible verification of the integrity of the proposed

database setup. The Consultant shall deliver completed, entered, and verified forms in no less than four batches starting two weeks after commencing full conduct of the survey (Task G).

Proposals shall also address the following issues:

1. What is the assumed usable response rate used in budget calculations?
2. Is achievement of the stated number of usable surveys guaranteed in the proposal even if additional staff hours are required? Or does the proposal simply guarantee a given level of effort (hours, bus trips, etc.)?

3. Will surveys only be entered onto the computerized database up to the required sample size quota or will all usable surveys be entered?

Products:

1. Deliverable H.1: Draft memorandum documenting proposed coding, logic-checking, and geo-coding conventions (prior to pilot study/pre-test)

2. Deliverable H.2: Forms entry, editing/logic checking, and reporting program(s) and coding manuals

3. Deliverable H.3: Geo-coding software program(s)

4. Deliverable H.4: Completed, coded and verified survey forms on disk

5. Deliverable H.5: Final memorandum documenting final coding, logic checking, and geo-coding conventions (after coding has been completed)

Task I - Perform Survey Data Expansion

Objectives:

1. Expand sample records into data about all passenger trips on NYCTA and NYCDOT routes.

2. Expand sample survey records into data about characteristics about these system's users.

Description:

The Consultant shall develop two types of expansion weights. The first type shall expand the sampled data into data about *passenger trips* on the system. Trip weights will be developed by the route/time-of-day/direction strata used in the sampling plan developed in Task B. The second type shall expand the sampled data into data about *system users*. Proposals shall specify data requirements for development of expansion weights.

Products:

Deliverable I.1: Report describing survey weighting procedures
Deliverable I.2: Completed survey forms on disk, including trip and person weights

Task J - Prepare Final Data Files and Documentation

Objectives:

1. Deliver clean, complete, and documented trip survey database
2. Prepare report documenting methods used throughout survey process
3. Prepare report summarizing survey results

Description:

The *final computer database* shall include documentation describing the file structure and definitions of all variables in the database. The database shall be prepared using one of the above software packages identified under the "Consultant Requirements" section on diskettes, or other media acceptable to the Project Manager.

The *Methods Report* shall contain an Executive Summary and a narrative description of the overall study methodology and detailed descriptions of each of the above tasks. The report shall also include brief assessments of how the selected approaches worked and any suggestions for improvement for future survey efforts. The development of appropriate weights for traveler and trip based hypothesis testing shall be documented in this report. A Technical Appendix shall be prepared, combining all previous written deliverables into a single document and delivered to the Project Manager upon conclusion of the project. The main Methods report can summarize the contents of the technical appendix rather than reproducing the appendix in full.

The *Survey Results report* shall consist of a basic statistical analysis of the survey dataset. This analysis shall, at a minimum, include frequency distributions on all categorical (discrete) variables, and minimum, maximum, mean, standard deviation, and mode for continuous variables. Cross-tabulations analyzing travel behavior by time of day, need to transfer, mode of access, and other independent variables by route type (NYCTA local, limited stop and express; individual private carrier local and express) shall also be presented. The Consultant shall also present a basic profile of each bus route surveyed including both the route's riders and linked trips served. Tabulations, charts, maps, or graphs presented shall analyze individual route ridership, rider characteristics, trip characteristics including transfers, special features or findings. The target audiences for this report are operations managers and service planners who work on quick response assignments.

The Methods and Survey reports shall include a table of contents, a glossary of terms, a full bibliography noting all documents, agencies and other sources from which data were taken. All pages within these documents will include a date, the section, page number, and the project title. All maps of areas will include a location map, north arrow and graphic scale.

Products:

Deliverable J.1: Clean and complete survey database on disk (6 complete copies)

Deliverable J.2: Draft documentation of survey database (20 copies)

Deliverable J.3: Final documentation of survey database (20 copies plus diskette)

Deliverable J.4: Draft Methods Report (20 copies plus 1 camera-ready original)

Deliverable J.5: Final Methods Report (50 copies plus 1 camera ready original plus diskette)

Deliverable J.6: Draft Survey Results report (50 copies plus 1 camera ready original plus diskette)

Deliverable J.7: Final Survey Results report (50 copies plus 1 camera ready original plus diskette)

Task K - Submit Progress Reports

Objectives:

Track progress on survey in a systematic manner

Description:

In addition to the foregoing tasks, the Consultant shall initially submit to the NYCTA Project Manager monthly (by the 15th day of the month) a brief progress report describing the work performed during the previous month and the schedule of work for the upcoming month. Reports shall describe any difficulties encountered during the reporting period and shall include a statement by the Consultant's Project Manager setting forth the following:

- Reporting period;
- Progress of study during reporting period;
- Planned progress for the next reporting period;
- Identification of any problems (for both the Consultant and for the NYCTA) that affect the Project or its timely completion;
- Proposed solutions/resolutions to the above problem;
- Projected ability to meet the schedule, and reasons for slippage if any;
- A chart showing schedule, percentage completed, projected percent completed by month;
- Analysis of actual costs incurred to date relative to budget, projections of future variations.

Once conduct of Task G starts (full bus survey) progress reports shall be submitted every week. These progress reports will contain a computerized cumulative survey status report. Each report shall include:

- Required sample size for each bus route/time-of-day/direction combinations (stratum);
- Required number of surveys to be distributed by same combinations as above;
- Number of surveys distributed for each stratum this survey period;
- Cumulative number, percent of surveys distributed for each bus route/time-of-day/direction combination;
- Number of surveys returned for each stratum in this survey period;
- Cumulative number, percent of surveys returned for each bus route/time-of-day/direction combination in this survey period;

Chicago Transit Authority, 1993

REGIONAL TRANSPORTATION AUTHORITY
REQUEST FOR PROPOSAL
CTA PASSENGER TRAVEL SURVEY
RFP Number 8191

1. INTRODUCTION

This Request For Proposal from the Regional Transportation Authority (RTA) is to perform a rider survey on a portion of the Chicago Transit Authority's (CTA) Bus and Rail system. The purpose of this rider survey is to provide route level data on the travel patterns of CTA's rail and bus passengers. This effort will develop the survey methods and apply them to a portion of the CTA system. It is anticipated that other portions of the CTA system will be surveyed in subsequent years until a comprehensive data base is established.

Interested firms may submit proposals either independently or jointly. The RTA reserves the right to reject any and all proposals, or parts of proposals in response to this RFP, to negotiate with any and all proposers, and to award a contract to that proposer whose response is most advantageous to the RTA.

2. BACKGROUND

The RTA was established in 1974, after the enactment of state legislation and a referendum, with jurisdiction over the six county metropolitan area. The RTA provides planning, funding, coordination, and is responsible for the fiscal oversight of three separately governed operating subsidiaries. The CTA, the Commuter Rail Division (Metra), and the Suburban Bus Division (Pace) are directly responsible for the provision of public mass transportation services in the metropolitan area. The RTA system is the second largest public transportation system in the United States. It carries approximately 8 % of total U.S. transit ridership.

The CTA is the largest of the three RTA subsidiaries, providing over three-quarters of the transit rides in the metropolitan area. Weekday riding totals 1.4 million unlinked trips. In 1992, 491 million rides were provided. CTA operates a fleet of 2,118 buses over 132 routes, which have 12,800 posted bus stops. Buses make more than 24,000 trips a day. On the rapid transit system, more than 2,000 train trips are made daily over 215 miles of track. The CTA's fleet of 1,204 rapid transit cars operates over six routes with a total of 138 stations. The CTA's 220 square mile service area is composed of the City of Chicago and 38 adjacent suburbs.

This project is being undertaken to gather current route level information on CTA's passengers. This was last done in 1979, when riders on the entire CTA system were surveyed. Since that time considerable change has taken place in the level, and distribution, of CTA ridership. Some of this change has been measured by market-oriented surveys of riders and non-riders conducted since 1987. These surveys have covered basic travel behavior, attitudes toward transit, fares, and other specific market segment questions. Other more recent travel surveys, such as the 1990 census journey to work and CATS household survey, also do not provide the route level information necessary for service planning and do not cover all trip purposes.

3. SCOPE OF WORK

A corridor-based rider survey of the CTA system is proposed. It is anticipated that these corridor-based rider surveys will be on-going from year to year. One transit corridor will be selected each year and all CTA routes which pass through that corridor will be surveyed. A new corridor will be selected each year until the entire CTA system has been surveyed, at which time the cycle will start all over again.

The purpose of this rider survey is to provide route and station level data on the travel patterns and characteristics of some of CTA's rail and bus passengers. However, this effort is also intended to develop and document survey instruments, sampling approaches, survey administration techniques, expansion weights, and data processing methods. The resulting procedures can then be applied to corridor surveys in subsequent years.

The information gathered from this survey will be used for many types of transportation planning and policy analyses. Service planners will require characteristics of passenger use of an individual route or station. Potential applications of this information include bus route restructurings and station relocations. Sub-regional analysts will require information about the extent and nature of passenger transfers, distribution of trip purposes, transit dependence, and differences in trip and traveler characteristics by time of day. Planners at the regional level will use the survey results for travel demand model validation and market analyses

REQUIRED TASKS

The specific work tasks required of the contractor are outlined below.

The data gathering technique for this study is to be a survey of CTA passengers on 29 bus routes and the O'Hare rapid transit line in the spring of 1994. The routes to be surveyed are listed in Exhibit B. These 29 bus routes account for approximately 26% of weekday CTA bus ridership. The 15 stations on the O'Hare rapid transit line, CTA's second busiest, account for approximately 15% of weekday passengers entering the rail system.

The survey will be conducted on weekdays in the AM Peak and Midday periods, except for the O'Hare Station which will receive a more thorough treatment. The O'Hare survey requirements are listed in the "Survey Design" section (Section A).

A self-administered on-board survey is envisioned for the bus routes. The rapid transit survey may employ on-board or station based techniques. If the proposed approach includes survey return via business reply mail, the contractor will be responsible for all aspects of mail returns.

The survey effort shall include the following:

A - Survey Design

<u>Sampling Plan</u>
The contractor will determine sample size and stratification. Approximate sample sizes, accurate within a +/- 5% margin of error at the 95% level, must be identified as part of all proposals. CTA System Data, included as Exhibit A, is to be used for development of approximate sample sizes. The bus sample will be representative of each route, in its entirety, by AM Peak and Midday time periods. The bus sample must be large enough to permit conclusions about travel in both directions, at the specified level. The rail sample will be large enough to be representative of each station by AM Peak and Midday time periods but does not need not be directionally specific. If a station-based approach is used for rapid transit, the

sample must include exiting as well as entering passengers. The contractor will also specify how the sample is to be selected.

The contractor will submit a draft sampling plan and survey expansion / weighting approach to the project team for review. Approval by RTA is required before the contractor conducts the pre-test.

Survey Instrument
The contractor will design and produce the survey instrument. See Exhibit C for previous examples of survey instruments. Information on trip and traveler characteristics is desired. Trip characteristics of interest include: purpose, origin and destination, routes used / transfers, means of access and egress, and fare media. Potential traveler characteristics include: age, race, sex, income, auto availability, and frequency of use.

Some of the routes and stations to be surveyed have significant numbers of Spanish and Polish speaking riders. Proposals should outline approaches, which insure a representative sample, for dealing with non-English speaking riders.

The contractor will submit draft instruments to the project team for review. Approval of the instrument by RTA is required prior to the pre-test and again prior to final printing.

Special Treatment of O'Hare Station
The O'Hare rapid transit station must receive special survey treatment. This station serves airport destined traffic, which is believed to follow a different time of day / day of week pattern. The contractor will survey O'Hare station passengers between 5AM and Midnight (surveying all but the "owl" time period). Passengers will be surveyed for this 19-hour period over a weekday, a Saturday and a Sunday. The O'Hare Station sample must be large enough to permit conclusions about travel in both directions for three day types (weekday, Saturday and Sunday). A separate survey instrument may be required for this station. Proposals should identify any unique issues associated with the O'Hare station.

B - Field Procedures

The contractor shall develop and document field procedures to be used. This includes training, scripts, crew sizes and deployment, field supervision, and quality assurance efforts. These procedures shall be reviewed with the project team prior to pre-testing and approved by RTA prior to data collection.

C - Conduct Pre-Test

The survey instrument and field procedures shall be tested on both bus and rapid transit. Results of the pre-test will be reviewed with the project team and adjustments will be made to the final instruments and field procedures.

D - Data Collection

The contractor will conduct surveys on specified routes in accordance with the approved survey design and field procedures. It may be possible to use CTA bus operators for survey distribution on bus routes. Proposals should compare the merits of this approach with the use of the contractor's personnel for survey administration.

The contractor must collect data such that it is complete and suitable for computerized geocoding.

E - Data Processing

The contractor will edit, code, and punch survey responses. Consistency checks and coding conventions shall be documented and approved by RTA prior to processing.

The contractor must code and store the survey responses such that they are suitable for computerized geocoding, which will be performed under a separate contract.

F - Expansion Weights and Tabulation

The contractor will develop two types of expansion weights. The first type will expand the sampled data into data about trips on the system. The second type will expand the sampled data into data about system users. Proposals should specify data requirements for development of expansion weights.

The route level tabulation will present the contractor's summary of survey responses at the route and station level. Profiles of both the route's riders and linked-trips-served will be developed. These profiles will be numerical tables, summarized by text and graphics. The target audiences for this report are operations managers and service planners working on quick response assignments.

G - Reporting

Two final products are required: a methods report and a documented database. All products must be submitted in draft and, after project team review, final form.

The methods report will contain a narrative description of the overall study methodology and detailed descriptions of each of the above tasks. The report should also include brief assessments of how the selected approaches worked and any suggestions for improvement in subsequent survey efforts. The development of appropriate weights for traveler and trip based hypothesis testing will be documented in the methods report. The target audiences for this report are analysts and other users of the survey data sets.

Twenty-five copies of the methods report and a camera ready original are required.

The final database will include documentation describing the file structure and definitions of all variables in the data base. The database will be delivered on diskettes, or other agreed media, in a format which can be imported into RTA and CTA applications. Two copies of the final database and 10 copies of the database documentation are required.

4. AGENCY COORDINATION AND SUPPORT

The RTA and Chicago Transit Authority (CTA) will be responsible for the overall conduct of the study, with project management provided by the RTA. A project review team will be formed with staff from the RTA and the CTA. It is anticipated that the project team will meet with the consultant to provide review of task products, supporting data and analyses, and technical direction. Proposals shall include a schedule of meetings with the project review team as part of the management plan. The contractor shall be responsible for preparation of meeting summaries.

The participating agencies will support the contractor's work through the provision of existing data, studies and analyses. It is anticipated that the contractor will draw heavily on these

existing resources. CTA is able to provide more current and detailed versions of the data contained in Exhibit A. Bus passenger boardings by fare type are collected on a continuous basis. These data are available at the route level by the five time periods. Rail station entering passengers are counted every November. This data set contains station level counts by fare and day type. Rail station entering passengers by time of day were last counted in 1988. CTA will conduct a new count in the spring of 1994. For this project, it is anticipated that the contractor will use one plus year old information for drawing the sample and more recent information for calculation of expansion weights.

The contractor's work should make maximum use of information currently available at the participating agencies. The contractor's final products must be compatible with the participating agencies current information and software. These requirements are intended both to minimize the contractor's information assembly time and to maximize the future usefulness of the products to the participants.

5. PROJECT SCHEDULE

A seven (7) month schedule has been established for this project. Data collection shall occur in April and May. **All data collection must be completed by May 20, 1994.**

6. BUDGET

The complete budget for this project is $240,000.

7. INSTRUCTIONS TO PROPOSERS

A. Schedule

The selection of a contractor and the conduct of the project will proceed according to the following time schedule:

Distribution of RFP	October 6, 1993
Pre-Proposal Conference	October 20, 1993 at 10 P.M. in the RTA Board Room
Proposals Due	November 3, 1993 by 5:00 p.m. at the RTA offices
Oral Interviews (if necessary)	November 8-10, 1993
Contract Award Recommendation submitted to RTA Board of Directors	November 19, 1993 (Expected)

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B. Proposal Submittal

Proposals submitted after 5:00 p.m. on November 2, 1993 will be rejected.

Eight (8) copies of the proposals must be submitted to:

Barbara A. Byrd
Manager of Administration
Regional Transportation Authority
181 West Madison Street, Suite 1900
Chicago, Illinois 60602

Proposals should be clearly marked front and back: **CTA Passenger Travel Survey**

C. Format of the Proposal

All proposals must be prepared according to the following format:

Cover Letter. The cover letter should summarize the key points in the proposal in no more than two pages.

Qualifications of Firm. The firm's capabilities and experience in conducting similar studies should be included. Up to ten similar projects may be described along with references for the projects cited.

Qualifications of Staff. The qualifications and experience of the project manager and other key personnel should be documented by resumes plus a brief narrative description. Participation in the projects described in the firm's qualifications should be noted, as well as any other relevant project experience.

Management Plan. The heart of the management plan is the identification of the number of hours allocated to each key individual and the total cost for each required task. If subcontractors are used, the plan should indicate their work and how it will integrate into the total work product. A project schedule, including proposed committee meetings and the transmittal of major products, should be included in the plan.

Study Approach. The proposal should describe the proposed means of conducting each task in the scope of work; the products from each task; and how the tasks are interrelated.

Cost Proposal. The cost proposal shall be submitted on RTA Form 4400 and must provide all labor rates, and unit costs of direct costs must be clearly indicated. In addition, a budget by task must be provided as part of the Management Plan.

Affirmative Action Requirements/DBE Participation. Affirmative Action Requirements, as specified in Exhibit C, shall be completed and submitted five (5) days before the proposal is due. Failure to complete this attachment may result in a proposal being considered non-responsive.

Wherein subcontracting opportunities exist under this Contract, the RTA has established a goal of 17% DBE participation. If a firm that is or can be certified as a DBE is proposing, they should submit their certification or apply for certification. Certification applications may be obtained from Lillian Wallace (312) 917-0733.

D. Financial Statement

The selected contractor will be required to furnish to RTA current statements of the financial condition of the contractor and any other financial information reasonably required by RTA, prior to contract execution.

8. PROJECT REPORTING REQUIREMENTS

The contractor will work closely with the RTA and CTA staff, therefore reporting will simply formalize what is already understood. Monthly project status reports which focus on study progress, issues, difficulties and plans must be submitted to the RTA. Progress should be reported against the milestones presented in the Management Plan. A monthly DBE Compliance Report (Exhibit H) is also required.

9. EVALUATION OF PROPOSALS

A selection committee will be drawn from the RTA and CTA staff. The selection committee may elect to conduct oral interviews of a "short list" of proposers. Oral interviews, if required, will be scheduled shortly after the proposal due date.

Proposals will be evaluated based upon the following criteria and their associated weights:

a. Specific related qualifications and experience of the firm and the key individuals designated for the study (20%).

b. Commitment of the key individuals designated for the project (10%).

c. General qualifications and experience of the firm (10%).

d. Quality of the technical approach (35%).

e. Quality of the management plan (25%).

10. BASIS FOR PAYMENT

The contractor will be reimbursed on actual expenditures of direct, overhead, general and administrative expenses, subject to a maximum of the proposed price for the CTA Passenger Travel Survey. The contractor shall submit monthly invoices within fifteen (15) days of the last business day of each month. Payments shall be made to the contractor within thirty (30) days of receipt of the invoice. Ten percent (10%) of each invoice shall be withheld and made payable upon the completion of all terms and conditions specified herein. This project will be funded, in part, with a grant from the Federal Transit Administration.

LIST OF EXHIBITS

Exhibit A - CTA System Data
Bus Route Ridership, Period 10, 1992
Bus and Rail Operating Facts, Winter 1991-2
Rail System November 1991 Traffic
Bus and Rapid Transit Distribution of Ridership by Hours

Exhibit B - CTA Bus Routes and O'Hare Rapid Transit Stations to be Surveyed

Exhibit C - Other Survey Instruments

Exhibit D - EEO Compliance Requirements

Exhibit E - RTA Form 4400

Exhibit F - Noncollusion Affidavit

Exhibit G - RTA Standard Contract for Professional Services using Federal Funds

Exhibit H - Insurance Requirements

Exhibit I - Contractor Certificate

Exhibit J - DBE Compliance Report

Appendix H

An Example Manual of Instructions for Onboard Surveys

ON-BOARD SURVEY

MANUAL
OF
INSTRUCTIONS

PREPARED FOR

REGIONAL TRANSIT AUTHORITY

BY

BARTON-ASCHMAN ASSOCIATES, INC.

October 1993

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I. INTRODUCTION

This booklet provides instructions on how you are to conduct a survey of riders aboard buses operated by the Regional Transit Authority (RTA) in carrying out this survey as part of a team assigned to survey sampled bus trips and the passengers boarding those buses. The survey will be conducted on weekdays in October, 1993. In order to help you do your job efficiently, this booklet contains a description of the purpose of the survey, and what you have to do during the survey. Please read and study this document thoroughly.

A. Purpose of the Study

The purpose of this study is to obtain origin and destination data for the New Orleans area. The survey will also provide valuable information on traveller behavior and patronage by route and direction.

You should encourage passengers to complete the questionnaire on board the bus they are riding, and to return the forms to the boxes located by the doors of the bus. Doing so will result in a higher response rate, thereby providing RTA with more accurate and usable data.

B. Participants in the Study

Over the survey period, you will be part of a small group of people who will participate daily in conducting the survey. This group will be riding buses, handing out questionnaires to passengers, and counting passengers who board buses. Your work is the most important part of the project. Please keep this in mind as you conduct the survey.

C. Duration of the Study

The survey will be conducted on weekdays over a two to three week period in November, 1993.

D. Tasks

During the survey, you will be responsible for carrying out the tasks listed in Table 1. These tasks will be explained to you in this manual.

E. Times of Study

The survey will be conducted between 5:00 AM and 10:00 PM each day, although the bulk of the work will be confined to the period between 6:00 AM and 9:00 AM in the morning and 3:00 PM and 6:00 PM in the evening. These are the busiest times and require the greatest care in conducting the survey properly.

TABLE I
ON-BOARD CHECKLIST

- Pick up work assignment from supervisor.

- Locate the correct bus. Look for a route name and number at the time of day corresponding to the departure time on the log. Check in with the driver. (If starting at a garage, check in with the Supervisor first.)

- Install the equipment:

  - "Survey Today" sign;

  - Return boxes;

  - Pencil Boxes.

- Prepare trip log on the outside of the first trip envelope and questionnaires:

  - Record the serial number of first questionnaire on log ("Beginning Questionnaire Number" for the 1st deck of questionnaires).

  - Enter departure time, this trip number, and direction on the trip envelope. Inbound direction is going toward downtown New Orleans, and outbound is going away from downtown New Orleans. If you are unsure of the direction, ask the bus driver.

  - Sign the log under "Surveyor Assigned".

- Place materials not in use in the seat beside you, or if the bus is crowded, place it on the floor or behind the drivers seat.

- Distribute a questionnaire (with a big smile!) to each boarding passenger.

- Count the passengers as they board the bus ("Tally of Boarding Passengers" on the trip log on the outside of the envelope).

- Conclude the work assignment:

  - Record on the surveyor's trip log the "Ending Questionnaire Number") the serial number of next available survey form, that is the questionnaire that is showing on the top of your pile.

  - Record the end location (intersection) of the trip under "Ending Location" at the bottom of the surveyors trip envelope, and re-write the ending questionnaire number next to it.

  - Record the time under "Fill in Time" at the bottom of the surveyors trip envelope, and circle AM or PM.

  - Place returned questionnaires in the current trip envelope, and make sure the trip log on the outside of the envelope is completely filled in.

  - If the completed trip is the last trip assigned on that bus, remove survey equipment and get off the bus and follow the instruction on your assignment sheet.

- Prepare for the next trip.

II. ADMINISTRATIVE MATTERS

Before describing in detail what you will actually do during the survey, it is important to first explain some general rules and requirements. These are things that you should keep in mind before you get ready to conduct the survey.

A. Punctuality

It is essential that you report to work on time, and that you meet your buses as scheduled. Persons who fail to report on time will be dismissed.

B. Appearance

You will be facing the public daily when riding RTA buses. The willingness of people to respond to the survey depends a lot upon how you look. Therefore, you will be expected to present a neat appearance.

C. Behavior

Be courteous! Be Friendly! Your behavior is very important to the success of the survey. For instance, some passengers will not like the survey, and will tell you so. Reply politely, and suggest that the questionnaire will help RTA to maintain and improve the bus system. If the person is abusive, or indicates that he does not want anything to do with the survey, accept the questionnaire and say something like, "I am sorry," and "thank you." In any event, do not get involved in an argument.

Mark questionnaires that are refused by boarding passengers with an R as listed on page 11 of this manual. Never hand a refused questionnaire to another boarding passenger.

Please report any problems you may encounter to your supervisor as quickly as possible. If you are unable to contact your supervisor, please call 452-3937. Be prepared to give the following information when you call:

- Your name;
- Where you are;
- Phone number from which you are calling;
- Assignment number on which you are working;
- Route name and number, trip number, and trip time of problem; and
- What the problem is.

D. Supervisors

A supervisor will be responsible for your performance. Your supervisor will meet you regularly in the field at prescheduled meeting places to supply you with your work assignments and materials, and to pick up materials that you have completed. If you have problems, your supervisor is the person to talk to regarding these problems. Your supervisor may ride with you from time to time to review your work and ensure that you are following the required survey procedures.

E. Reporting of Time

Report the time you worked to the nearest quarter hour. You must fill out a time sheet in order to get paid. Your supervisor will be required to verify and approve the hours of work which you report.

G. Transportation

You are allowed to ride RTA buses free of charge while you are working on this survey, and are traveling to and from your work assignments only under the following two conditions:

1. You are wearing your identification badge (See Figure 2).
2. You have your interviewer's kit (See pages 6 and 7).

Passes or fare money will be provided for your work related travel. You should plan to use the transit system whenever possible in your work rather than private car.

Usage of passes and fare money will be closely monitored by your supervisors. To repeat, these are only to be used for work related travel. Usage of these passes and/or fare money for personal travel or any other abuse may result in your dismissal.

H. Reimbursement for Use of Personal Auto

Should you be required to use your personal auto to make connections between bus trips during a particular assignment, you will be not be reimbursed, as this is a normal expense incurred during your work assignment. Barton-Aschman Associates, Catherine Bryant Associates, or RTA will not be liable in the event of any accident occurring while you are working on this assignment.

You will not be reimbursed for travel to and from your home. Such travel is considered to be a normal commute which would be expected in any job.

Figure 2

TRANSIT
SURVEYOR

III. DEFINITION OF TERMS

In this part of the instructions, we have defined some words which you will hear people use frequently during this survey. Some are critical to your understanding of your job.

- *Bus Trip*. A one-way movement of a bus from the beginning of a route to the end of the same route.
- *Route*. The geographical path followed by a bus from start to finish of a given trip. Several routes may travel over a single portion of roadway.
- *Run*. A bus driver's work for one full day, i.e., the buses driven by and the routes which he drives.
- *Block*. All of the trips which a particular bus makes in one day of operation.
- *Stop On*. The location where a person boards a bus.
- *Stop Off*. The location where a person gets off a bus.
- *Transfer Passenger*. A passenger who uses a transfer to board the bus in lieu of paying a cash fare or using a pass.
- *RTA*. The New Orleans Regional Transit Authority. The agency which operates the system on whose buses you will conduct the survey.
- *Origin*. The place a person first leaves from on the trip that they are making. (Think of the origin as the door of a building--their home, work, doctor's office--the person walked out of to begin their trip).
- *Destination*. The place a person goes to on the trip that they are making. (Think of the destination as the door of the building--home, work, doctor's office--the person walks into at the end of their trip).
- *Bus Stop On*. The stop where the person got on their first bus to begin their current trip (near the origin of their trip).
- *Bus Stop Off*. The stop where a person will get off of the last bus where their trip ends (near the destination of their trip).

IV. SURVEY EQUIPMENT - INTERVIEWER'S KIT

Each day you will be provided with a kit of materials which are needed to conduct the survey. These materials fall into the following two categories: equipment which you will install on board the bus, and materials which you will retain for use and distribution during the on-board bus survey.

A. Bus Materials

These will be installed by you on-board each bus selected to be included in the survey. These items of equipment will be helpful to the riders in completing the questionnaire and returning the completed questionnaire.

1. *Return Boxes*

Each kit will include two boxes to be used by bus riders to return survey questionnaires when leaving the bus. These boxes will be hung on the railings by the doors located in the front and back of the bus, in the locations marked with a 1 in Figure 3. Reusable Velcro fastening materials will be included in your kit for attaching the return and pencil boxes.

2. *Pencil Boxes*

Two boxes with pencils will be provided for you to make available on your bus trips to those persons who ask for them. These will be located on board the bus in the locations marked 2 in Figure 3. The pencil box at the front of the bus should be on either side but nearby your survey station to point to if a passenger asks you for a pencil.

3. *"Survey Today" Signs*

Each kit will contain a "Survey Today" sign, which will be used to alert boarding passengers that a survey is being conducted on- board that bus. This sign will be placed in the front window of the bus in location 3 shown in Figure 3.

B. Surveyor Materials

These materials will be given to you to use as part of a kit. You will use some of these materials yourself, and you will distribute some to the riders on the bus.

1. *Identification*

You will be issued an identification badge which shows that you are allowed to conduct the survey on this bus. You must wear your identification badge at all times while conducting the survey.

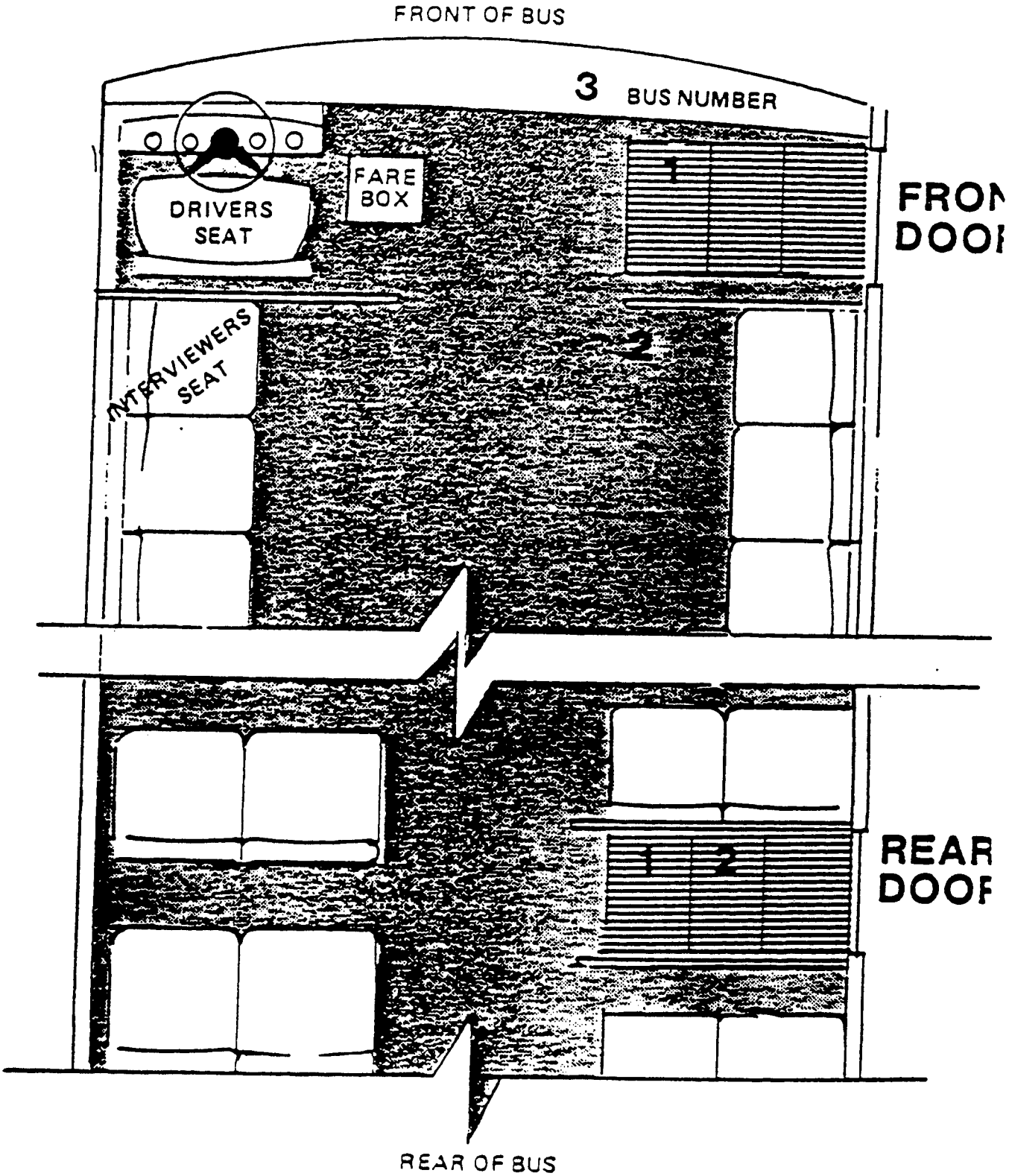
2. *Clipboard and Dispenser*

Each kit will contain a clipboard, and a questionnaire dispenser for you to use during the course of your assignment.

3. *Survey Questionnaires*

Your kit will contain enough questionnaires for an entire day's work. Survey questionnaires will be prepackaged for you in groups of 100 for convenient handling.

FIGURE 3


FRONT OF BUS
3
BUS NUMBER
DRIVERS SEAT
FARE BOX
1
FRON
DOOI
INTERVIEWERS SEAT
2
REAR
DOOF
1
2
REAR OF BUS

4. *Surveyor's Trip Logs*

A trip log as shown in Figure 4 will be printed on the outside of each trip envelope,. and should be filled out completely for each assigned bus trip that you will make in a day. The following information will be written in for you on each trip log:

- Route number and name.
- Block Number.
- Trip Serial Number.
- Assignment Number (the serial number of the surveyor's bus trip assignment sheet).
- Date you ride the Assigned Bus.

5. *Return Envelopes*

Return envelopes will be included for each bus trip you have been assigned to survey. The envelopes are to be used for storing returned survey forms and are printed with information on the outside which is vital to the success of the survey. When a trip is complete, collect <u>all</u> of the completed, blank, discarded, and refused questionnaires from that trip and place them in the return envelope.

6. *Plastic Sack*

A carrying sack will be provided to carry each kit, and a plastic bag which is particularly helpful in case of rainy weather. The entire kit should be enclosed in this bag to keep the materials together in one place and dry.

Figure 4

Surveyor's Trip Log

Route Number _____ Route Name _____

Block Number _____ Assignment Number _____

Departure Time _____ This Trip Number _____
(circle one) AM PM

Date _____ Total Trips in This Assignment _____

Driver's Name: Surveryor Assigned:

_____ _____

Direction [ ] 0 - Outbound 1 - Inbound

	1st deck	2nd deck	3rd deck
Beginning Questionnaire Number :			
Ending Questionnaire Number :			

Vehicle number painted on bus [ ]

Start Location: _____ at _____ Serial number: [ ][ ]-[ ][ ]	Tally of passenger boarding the bus	Total

Ending Loction: _____ at _____

Ending questionnaire number: [ ]

Fill in Time: [ ] (circle one) AM PM

Remarks: _____

RETURN ENVELOPE CONTROL LOG

Assignment# _____

Trip _____ of _____

Route# _____

Route Name _____

Surveyor _____

Passengers Boarded _____

ARE SURVEYS AND TRIP LOG IN ENVELOPE?

Figure 5

7. *Watch*

A reliable watch while conducting the survey, which will eliminate missed departure times and inaccurate recording of times (on the trip log printed on the envelope).

8. *Change*

You should carry at least $2.00 each day in quarters for use in making phone calls to your supervisor. Keep track of money spent on calls, because you will be reimbursed for this possible expense.

9. *Surveyor's Bus Trip Assignment Sheet*

This sheet lists the bus trips which you are assigned to ride for the day. See Figure 6 for an example the information which it will contain.

V. ON-BOARD PROCEDURES

These are the most important steps for you to follow to successfully do your work. Please review these before you start each day's assignment.

A. Pick Up Work Assignments

Each day you will meet your supervisor at one of the garages or at a prearranged location to pick up your work assignment. Your supervisor will give you a log of all bus trips assigned to you for the day, and will go over your assignment with you. An example assignment sheet is shown in Figure 6.

Figure 6

SURVEYOR'S ASSIGNMENT SHEET

ASSIGNMENT NUMBER _____ REPORT DATE _____

SURVERYOR ASSIGNED _____ REPORT TIME _____

QUESTIONNAIRES ASSIGNED _____ TO _____ REPORT LOCATION _____

TRIP NUMBER	ROUTE NUMBER	DIRECTION IN/OUT	BLOCK NUMBER	START LOCATION	DEPARTURE TIME	END LOCATION	ARRIVAL TIME	INSTRUCTIONS or DRIVER

Prepared by _____ Date _____ SURVEYOR

Checked by _____ Date _____ COMMENTS: _____

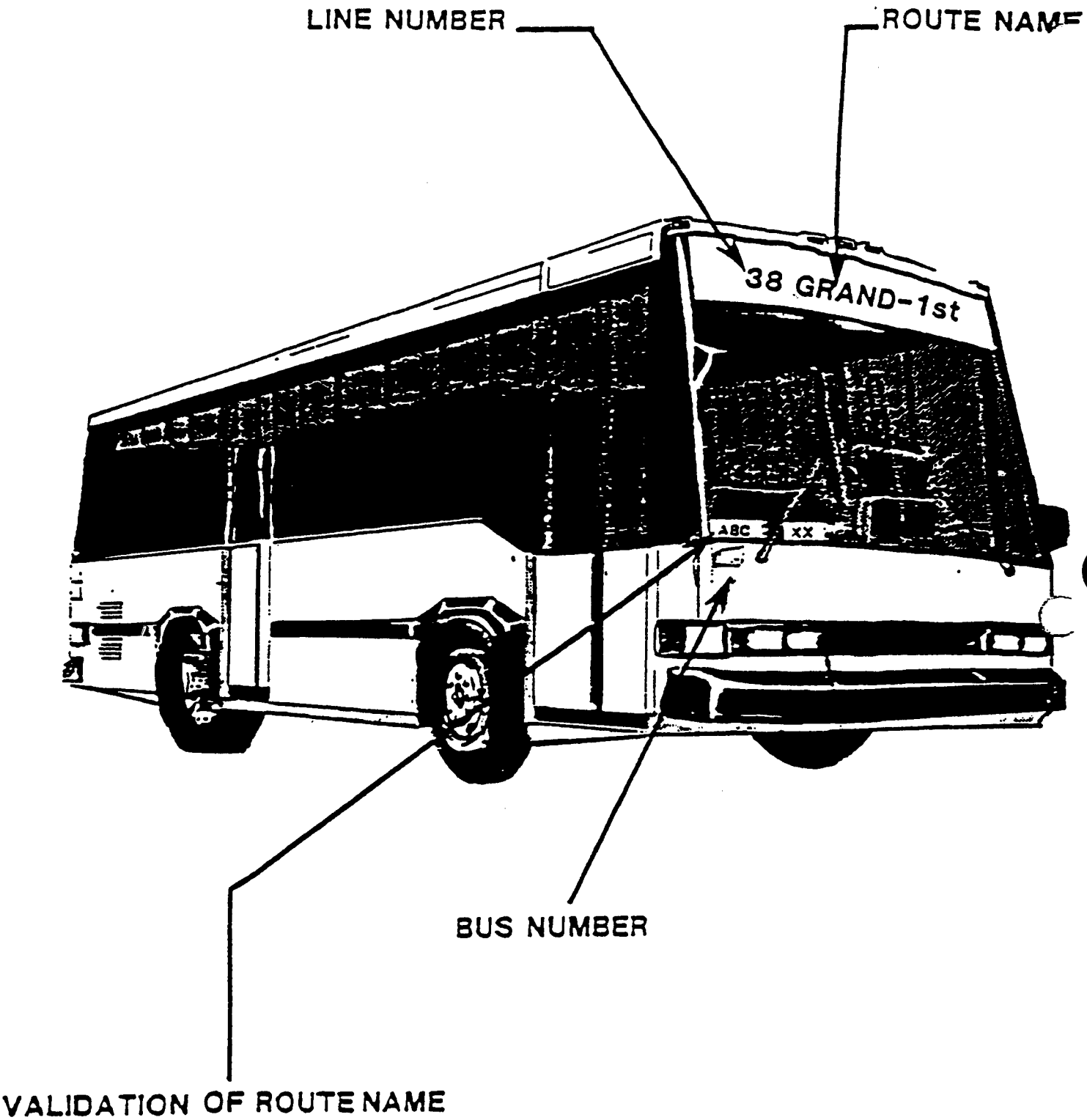

LINE NUMBER
ROUTE NAME
38 GRAND-1st
ABC
XX
BUS NUMBER
VALIDATION OF ROUTE NAME

Figure 7

B. Find the Correct Bus

It is very important that you board the bus to which you are assigned. Remember that a substitute bus is of no value to this survey.

The bus for which you are looking will have a route name and number (see Figure 7) and a scheduled time of departure. If your first bus trip assigned for the day does not begin at a garage, the bus will be at the first bus stop (see definitions) at a specified time. If the first bus trip assigned to you for the day does begin at a garage, the bus you are looking for can be located by asking your Supervisor. The dispatcher will then tell you which bus you need to board.

To make certain that you are boarding the right bus, check with the driver to see if the route number, as well as the departure time and block number agree with your assigned trip times. To verify that you are boarding the correct bus, you can show the driver your assignment sheet and the trip you are looking for. The driver can confirm that this is his next bus trip.

After you have found the right bus, record the bus number on your trip log. The bus number may be seen in several places on the exterior of the bus, as well as in the interior of the bus (see Figures 7 and 3). The bus number will always be a three-digit number (e.g., 357).

C. Establish Rapport with Driver

Gaining the cooperation of the bus driver will greatly help you in conducting the interviews. When you are boarding the bus, politely introduce yourself, and explain who you are.

Be sure to wear your identification badge where it can be easily seen. You will be provided with flash passes or tickets which entitle you to ride the bus, so there should be no disputes about whether you are entitled to ride the bus.

Sometimes there will be differences in the assigned block, route, and departure times on your assignment sheet and those indicated by the driver. At these times, you will have to use your best judgment to determine if in fact you are about to survey the correct bus. If there are small differences in time, then make a note of the time as indicated by the driver and survey the bus.

If the begin and end locations (bus origin and destination) and times are correct, but the block is wrong, then enter the block number in the Remarks section and survey the trip. If the bus is not going to the assigned location, get off, and call the office.

An established rapport with the driver can be helpful in other areas as well. When the driver takes a short break between trips, you may also take a break. He or she will tell you when the bus is scheduled to depart again. If you are unsure of where the end of the trip is, for example on bus routes which are loops, ask the driver to let you know when the end of the trip is coming up. This helps you keep a good separate count for each individual trip. If your assignment is ending, and you are unsure of how to get back to the garage or location where your assignment began, ask the driver.

D. Install Equipment

Once you have found the correct bus, install the equipment from your kit that will be placed on the bus as previously instructed. If you cannot install the pencil boxes as shown, then pass out pencils yourself. You must install the equipment quickly, so that you will be ready when the bus trip begins. Use the Velcro fastening provided for the boxes.

E. "Capture Seat Behind The Driver"

The best seat to conduct the survey from is the one directly behind the driver. Therefore, it is essential that you obtain this seat. This is one reason to be at your assignment at the assigned time, then you can board the bus early. Sometimes these seats are reserved for elderly or handicapped individuals. If someone is in the seat, explain that you are conducting a survey and it is better if you have the seat, and ask the passenger to take another seat. If you are sitting in the seat and no other is available at the front of the bus, and an elderly or handicapped person boards the bus, you should stand up and conduct the survey from a standing position until that seat is free again. Note that you do not have a right to the seat behind the driver and that surveyors who are rude in their approach to persons in that seat will be dismissed. Usually, you will board the bus when its empty, so this should not be a problem.

F. Prepare Questionnaires

After you have placed all of the materials on the bus, remove your clipboard, the return envelope, and questionnaire dispenser from you kit. Except for the first trip of the day, there will probably be cards remaining in the dispenser from the previous trip which you made. Record the serial number of the first card onto the trip log in the space marked "Beginning Questionnaire: 1st Deck."

If there are very few questionnaires left in the dispenser from the previous trip, you should be prepared to change decks in the middle of the new trip by pre-recording the first serial number of the next (unopened) deck under "Beginning Questionnaire Number: 2nd Deck" on the trip log. If you run out of questionnaires, note the occurrence in the "Remarks" section, get off the bus as soon as you can, and telephone your supervisor. Provide your supervisor with the information listed on page 3.

After you have taken your materials out of the kit, place the sack containing the unused materials behind the driver's seat (shown as point 4 in Figure 3). Your seat will be directly behind the driver's seat. After you have completed these steps, you will be ready to begin surveying your assigned bus trip.

G. Data Collection Procedures

On every bus trip you have been assigned to survey, you will be required to perform the following tasks:

1. Pass our survey questionnaires to people who board the bus.

2. Make counts of people boarding the bus.

3. Record serial numbers of the questionnaire at the beginning and end of the routes.

The following sections describe the overall on-board bus procedures and some special problems.

1. *On-Board Bus Procedures.*

The following steps illustrate the on-board procedures you will be utilizing in the on-board bus survey:

- First locate the assigned bus and board it. Ample lead time will be provided in your schedule.

- Check with the bus driver and verify that you have the correct bus. If you clearly have boarded the wrong bus, attempt to find the correct bus. If you find you have missed the correct trip, see Section I for the steps you should take.

- Install all necessary equipment after boarding the bus.

- Place the "SURVEY TODAY" sign in the front window of the bus, and hang the pencil boxes filled with pencils and the two return boxes by both exit doors. The boxes will have Velcro fasteners for easy handling and attachment.

- Your survey work begins with the first boarding passenger. You will have already entered the serial number of the first survey questionnaire on the bus trip log. Hand every person six years of age or older that boards the bus a questionnaire, and tally the passenger in the appropriate box on the trip log.

- If a rider declines to accept a questionnaire, mark that questionnaire with letter "R",. and put it in the trip envelope for that trip. <u>Do not issue that card to any other rider</u>.

- Typically, you will not be providing instructions to the passengers. If asked, however, instruct the rider to fill out the questionnaire and deposit it in the return boxes at either bus exit. Encourage the passenger to complete the questionnaire before leaving the bus. The questionnaire has a postage free return address printed on the back, so that if the rider does not complete the questionnaire on the bus, he or she can still complete it and drop it in the nearest mailbox.

- Continue handing out questionnaire and tallying passengers at each bus stop as passengers board the bus.

- At the end of the trip, fill out the log on the trip log envelope, check that you have all of the completed questionnaires that have been placed in the two return boxes, and inspect the seats for any questionnaires that may have been filled but were left on the seats, or may have fallen to the floor. These questionnaires should be placed in the envelope for that trip.

- If the next revenue trip of the bus is also on your work assignment, leave the equipment on the bus and prepare to repeat the procedures described above on the next trip of the bus.

- If the next revenue trip of that bus is not on your assignment, pick up all of the equipment and unissued cards, and proceed to your next assigned bus trip.

2. *What To Do With Refusals*

As you try to pass out survey cards, some people will refuse to accept the survey card. When a person does this, DO NOT PUT THE CARD BACK INTO THE DISPENSER OR GIVE IT TO ANOTHER PASSENGER. Instead, remember to mark it with the letter "R" for refusal, and put it in with the returned survey cards for that trip in the trip envelope provided. If you pass the card out to someone else, or if you put it back in your dispenser, you will spoil the count of boarding passengers based on the serial numbers dispensed during that trip. If there is no time to mark the refused questionnaire with an "R" and place it in the envelope, just drop it to the floor and put your foot on it until you have time to mark it and put it in the trip envelope.

3. *Persons Already on the Bus Before You Arrive*

Should there already be persons on the bus when you arrive to work a bus trip, write down the number of persons in the "Remarks" section of your trip log (e.g., "8 passengers already on board"). Give each of these persons a questionnaire, and write the serial number of the next blank questionnaire in the remarks column of the trip log. This will rarely happen.

4. *End of Trip*

You will repeat the steps described in Section 1 above until you reach the last stop on your bus trip. Record the serial number of the next questionnaire (the one showing at the top of your pile) in the trip log space marked "Ending Questionnaire Number:" and again at the space at the bottom by "Ending location". Remember that if you had to add an additional deck during a trip, you will have two end serial numbers recorded, one for each deck of cards that you used.

You should put the following items into the return envelope for each trip: all <u>returned questionnaires</u>, rejected/refused questionnaires, blank questionnaires found on the seats on floor of the bus at the end of the trip, and the <u>completed trip log</u>. Close the envelope with the attached clasp, but do not seal the gummed flap. Finally, remove all equipment from the bus, put it into your kit, and get ready to find your next bus trip if you have more trips for the day.

H. Making Counts of Boarding Passengers

For each passenger that boards the bus on each trip, place one hatch mark in the portion of the surveyor's trip log under "Tally of Boarding Passengers". At the end of the trip count the hatch marks and write the number under "Total". If the driver has kept track of the number of boarding passengers, you may be able to check your number against his. If they are different, write the driver's tally under your own and circle it.

End of Trip. Repeat the process described above until you reach the last stop on your trip. At this point, you will allow passengers to alight and collect questionnaires when offered. Record the serial number of the next available questionnaire in two places on the trip log:

- o Ending questionnaire number: 1st Deck or 2nd Deck, and
- o Ending questionnaire number under Ending location.

Remember that if you had to change to a new pack of questionnaires during a trip your last serial number will be recorded under "Ending Questionnaire Number: 2nd Deck". Record the end-of-trip time at the bottom of the trip log under "Fill in Time" and circle AM or PM.

At the end of each trip, walk through the bus once to pick-up all of the questionnaires which may be on the seats or floors, even if they're blank. Collect the completed questionnaires from the survey return box.

Put the following items into the return envelope for that trip: All returned questionnaires, blank questionnaires that you handed out, and rejected/refused questionnaires. Check to make sure the outside of the envelope is completely filled in. Close the envelope with the attached string or clasp but do not seal the gummed flap. Finally, pull out the envelope for the next trip, and fill in the appropriate information:

- this trip number
- departure time
- direction
- begin questionnaire number
- vehicle number
- start location

You are now ready to survey the next trip.

I. General Comments

The following suggestions will help you conduct the survey properly:

- **Courtesy to the Passengers.** It is an important part of your job to deal with passengers in a friendly and courteous way as they board the bus. As people board, greet them with a "good morning," or "good evening," and say that you are conducting a survey for the Regional Transit Authority. If they ask you what the survey is for, tell them that is a survey to improve bus service and find out more about the bus passengers. It does not have anything to do with the fare proposals or service changes that might be under consideration by the Transit Authority at this time.

- **Refusals.** As discussed earlier, one of the problems that you are going to have to deal with on the bus is that some passengers will not want to accept survey cards or they will be curious to know why they are being asked to take one. When this happens, explain to them that the results of the survey will be confidential and ask them to help the RTA plan for better service. If they flatly refuse, take the card that you would have given them, mark that card with an R, and put it in the trip envelope.

- **Encouragement to Respond.** It is part of your job to encourage the people to respond to the survey. Do this by assisting people with questions, by pointing out the location of pencil and return boxes, and assisting the passengers in general. Encourage riders to return the questionnaires before leaving the bus. They are generally more accurate than those returned by mail.

- **Bus Breaks Down.** If the bus you are on breaks down and another is sent in relief, look up your next work assignment and ask the driver to help you find a way to get to your next assignment. If it is clear that you are not going to be able to get to your next assignment on time, you should call 452-3937. A supervisor on duty will try to arrange transportation for you to your next assignment or for the one following that. When leaving a bus that is broken

down, remember to collect all your materials and to make a note of the fact that the bus broke down in the "Remarks" section of your Trip Log. Make certain that you have the bus number. You will not be paid for break-down trips unless you have the bus number which we will use to verify the time and place of the break-down.

- **Missed Trips.** If you miss a trip, which should happen only when an assigned bus does not come to the location it was supposed to, or the previous bus you have ridden is so late that you cannot make your connection, call and try to make arrangements to meet the next possible assignment on your work sheet.

- **Information to Give When Calling In.** If you call 452-3937 with a problem, please give the following information:

- Your name,
- Where you are,
- Phone number you are calling from,
- Assignment number you are on,
- Block number of trip with problem, and
- What the problem is.

This will help speed the answers to your questions.

- **On-Board Check List.** The checklist shown in Table I, Page 2, is a step-by-step list of items to accomplish on each trip. This checklist will be taped to the back of your clipboard and will be handy for you to refer to often.

Appendix I

Example of a Recent Establishment Survey Fieldwork Manual and a Recent Hotel Interviewer Manual

1994 WORKPLACE ESTABLISHMENT STUDY

Manual of Instructions

September 1994

Prepared for
North Central Texas Council of Governments

Prepared by
Catherine Bryant & Associates, Inc

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I. INTRODUCTION

This booklet provides instructions on how to conduct a survey of employment sites around the Dallas/Ft. Worth Metroplex area. As part of this survey you will be a member of a team assigned to survey the mode of travel for employees and visitors of selected area employment sites. Because the study covers such a large geographical area, the study area has been divided into two zones: approximately one third of the establishments to be surveyed are located in the western zone (Ft. Worth) and the remaining two thirds are in the eastern zone (Dallas).

This booklet contains a description of the purpose of the survey and what your responsibilities will be during the survey. Please read and study this document thoroughly.

A. Purpose of the Study

The purpose of this study is to obtain information on trips that employees make to and from work, and on the trips that visitors make to commercial establishments. The information will take three forms; data collected from employees about their travel during a single work day, data collected by interviewing visitors to the workplaces for information about the trip that brought them there, and counts of people and commercial vehicles.

Figures 1-3 contain letters that were mailed in late August to each establishment. They explain the study and are a good resource for you if you have questions. A copy of each letter will be in the site kits should you need to refer to them.

North Central Texas Council Of Governments

Dear Employer:

Transportation is vital to maintaining and improving the economic health of our region. Your customers and workers, in particular, must be able to get to your place of business. The reason for this letter is to enlist your support in a very important study that will help forecast travel needs and plan for future transportation improvements in your area.

The North Central Texas Council of Governments (NCTCOG) is a public agency which works with Metroplex cities and the Texas Department of Transportation to plan improvements to our transportation systems. We have hired Barton-Aschman Associates (BA) and Catherine Bryant & Associates (CBA) to assist us in updating a travel data base that is now ten years old. Through a random sampling process, your establishment is one of only 300 in the Dallas-Fort Worth Metropolitan Area that will be asked to participate in this travel survey.

Sometime in the next three to ten days, you will be called by an NCTCOG representative from CBA who will be asking for your permission to conduct a one-day survey during normal hours of operation. Trained interviewers paid for by NCTCOG will ask a sample of arriving visitors a series of questions about their travel patterns to your establishment, with each interview expected to take less than a minute. CBA staff will also ask you to distribute a questionnaire to your employees about their actual travel on the survey day, which can be filled out in less than 15 minutes. Both CBA and NCTCOG staff will work with you to minimize any inconveniences to your customers and employees.

We will take extreme care to see that detailed travel data about your establishment is kept confidential. Only summaries that include travel data from other employers will be used to document current travel characteristics in the Dallas-Fort Worth area.

The workplace survey is just one part of a two-year regional travel survey program that includes roadside travel surveys, household surveys, and transit surveys. I encourage you to read the other material in this packet and want to thank you in advance for your cooperation. If you need more information about the objectives of the workplace survey, either before or after you receive a call from Catherine Bryant & Associates, please call Ken Cervenka, NCTCOG's project manager, at (817) 695-9240.

Sincerely,

Mike Eastland

Mike Eastland
Executive Director

KC:kdc
Attachments

616 Six Flags Drive, Centerpoint Two
P. O. Box 5888, Arlington, Texas 76005-5888

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NORTH TEXAS COMMISSION

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Richard L. Connor
David Doyle
Gale Duff-Bloom
Hector Escamilla, Jr.
Joe R. Ewen
Valerie Freeman
Kay Granger
rl L. Harris
Douglas D. Hawthorne
John J. Hernandez
*Alfred F. Hurley
Lee F. Jackson
Devoyd Jennings
J. Peter Kline
*Robert B. Lane
A. K. Mago
Michael J. McCarthy
Liz Minyard
*Ciprano R. Munoz
James N. Muns
Charles R. O'Neal
*J. J. O'Neill
*Reece A. Overcash, Jr.
Joe K. Pace
Ronald L. Parrish
Edward A. Peterson
Paul R. Ray, Jr.
J. Thomas Schieffer
Kimberly J. Simpson
Elwin L. Skiles, Jr.
Bob Smith
Ronald L. Smith
*D. Lynn Spruill
Annette Strauss
J. Michael Talbert
Wes M. Taylor
Ted Tedesco
Gary Terry
Tom Vandergriff
J. William Wennch
H. Ron White

Directors Emeritus
W. Evans
rd H. Friedman
Langley

President
Dean H. Vanderbilt

*Executive Committee

Dear Employer:

The North Central Texas Council of Governments (NCTCOG) and the Texas Department of Transportation are conducting a Workplace Travel Survey in our area during September, October, and November, 1994. Your firm has been selected to participate in this important survey and we are asking for your cooperation.

The purpose of these surveys is to obtain important travel characteristics of employees and visitors at approximately 300 randomly selected business establishments in the Metroplex. With the permission of each business, survey forms will be completed by employees on the same day that visitors entering the establishment are interviewed.

The information gathered during the survey will be used as part of a two-year regional travel survey program that includes roadside surveys, household surveys, and transit surveys. Summaries of the information will be used to forecast travel needs and are essential to planning improvements to ease highway congestion and improve traffic conditions.

NCTCOG has retained Barton Aschman Associates, and Catherine Bryant & Associates (CBA), firms specializing in transportation surveys, to assist in the collection of travel data. *In a week or so*, someone from CBA will call you to discuss your firm's participation in the study. At that time, you will have the opportunity to ask any questions you may have concerning your participation.

If you have any questions about the Workplace Travel Survey, please call Robin Craven, 1-800-299-8966, at CBA, Ken Cervenka, metro 817-695-9240, at NCTCOG. We urge your cooperation when the representative from CBA calls.

Sincerely,

Dean H. Vanderbilt

Dean H. Vanderbilt
President

Mailing Address: P.O. Box 610246 • DFW Airport • Texas • 75261

News Release

September 1, 1994
Contact: Ken Cervenka, NCTCOG
Transportation Department, (817) 695-9240

North Central Texas Council of Governments
Post Office Box 5888
Arlington, Texas 76005-5888
(817) 640-3300 FAX: 817-640-7806

Metroplex Workplace Travel Surveys To Be Conducted During September, October, and November

The North Central Texas Council of Governments (NCTCOG), in conjunction with the Texas Department of Transportation (TxDOT), will be conducting workplace travel surveys in the Dallas-Fort Worth Metropolitan Area during the months of September, October, and November 1994. The purpose of these surveys is to obtain important travel characteristics of employees and visitors at approximately 300 randomly selected establishments in a 5,000 square-mile area, consisting of all of Collin, Dallas, Denton, Rockwall, and Tarrant Counties, and portions of Ellis, Johnson, Kaufman, and Parker Counties. The information collected from these surveys will help NCTCOG, TxDOT, and local agencies in planning future transportation improvements for the area.

The random sample of approximately 300 workplaces (stratified by business type and number of employees) was obtained from a Dun & Bradstreet database that lists 29,000 employers in the Metroplex that have ten or more employees at a specific physical location. Once a sample has been selected and the address information verified by telephone, a letter describing the survey will be mailed to the Chief Executive Officer, business owner, or other responsible person. About a week later, this individual will be called to gain approval for NCTCOG to conduct a one-day survey during normal weekday hours of operation. With the permission of the employer, survey forms will be completed by employees on the same day that some of the visitors entering the establishment are interviewed. The locations and dates for specific surveys will not be publicized, since this may skew the statistical results.

The workplace surveys are part of a two-year, $1 Million-plus regional travel survey program that is paid for through state and federal transportation planning funds. Other surveys include roadside travel surveys, household surveys, and transit surveys, and are necessary for planners and engineers at the local and state levels to better understand traffic and transit flows, congestion levels, and other aspects of the trips people make every day. This information is a key step in planning and providing for a more efficient transportation system in the Metroplex.

Although considerable information will be collected, NCTCOG will take extreme care to see that individual traveler data and employer data is kept confidential. Only aggregate summaries will be used to document current travel characteristics, forecast travel needs, and plan for future transportation improvements in the Dallas-Fort Worth area.

The last time a workplace travel survey was conducted by NCTCOG was in 1984. Those employers who are contacted through the random sampling process are encouraged to cooperate and participate in this important 1994 update. For more information about the workplace surveys, call Ken Cervenka, Principal Transportation Engineer, in NCTCOG's Transportation Department, (817) 695-9240.

###

This information will be used in describing trips to all businesses in the Dallas/Ft. Worth Metroplex area in a computer model of travel. The survey will also provide valuable information on the travel behavior of employees. Since each business in this survey represents about 100 businesses in the Dallas/Ft. Worth Metroplex area, your careful and complete work will ensure the accuracy required to successfully complete this study.

B. Participants in the Study

Over the survey period, you will be part of a group of people who will participate daily in conducting the survey at sampled workplaces. Each day, members of this group will be assigned to all entrances at an employment site. All people who enter an establishment will be counted, and as many as possible will be interviewed. In addition, travel forms will be given to the employees of the workplace at the beginning of the survey day, and picked up at the end of the day.

Your work is the most important part of the project. Please keep this in mind as you conduct the survey.

C. Duration of the Study

The survey will be conducted on weekdays over a six week period during September and October 1994. The first study day is September 20.

D. Times of Study

The survey will be conducted during shifts specified by senior members of the project team. For establishments that are open 8 to 10 hours per day, one group of

interviewers will be assigned. For workplaces open 24 hours a day, two teams of interviewers will cover the necessary shifts. Regardless of when the workplace opens, the interviewing team must arrive on site 15 minutes to 30 minutes prior to when the first employee arrives. The interviewer team must also stay 15 minutes after the business closes.

E. The Site Plan

A site plan has been prepared for each workplace in the study. This plan will show all entrances which will require counters or interviewers. An example site plan is shown in Figure 4.

SITE PLAN EVALUATION FORM

CBA ID #:

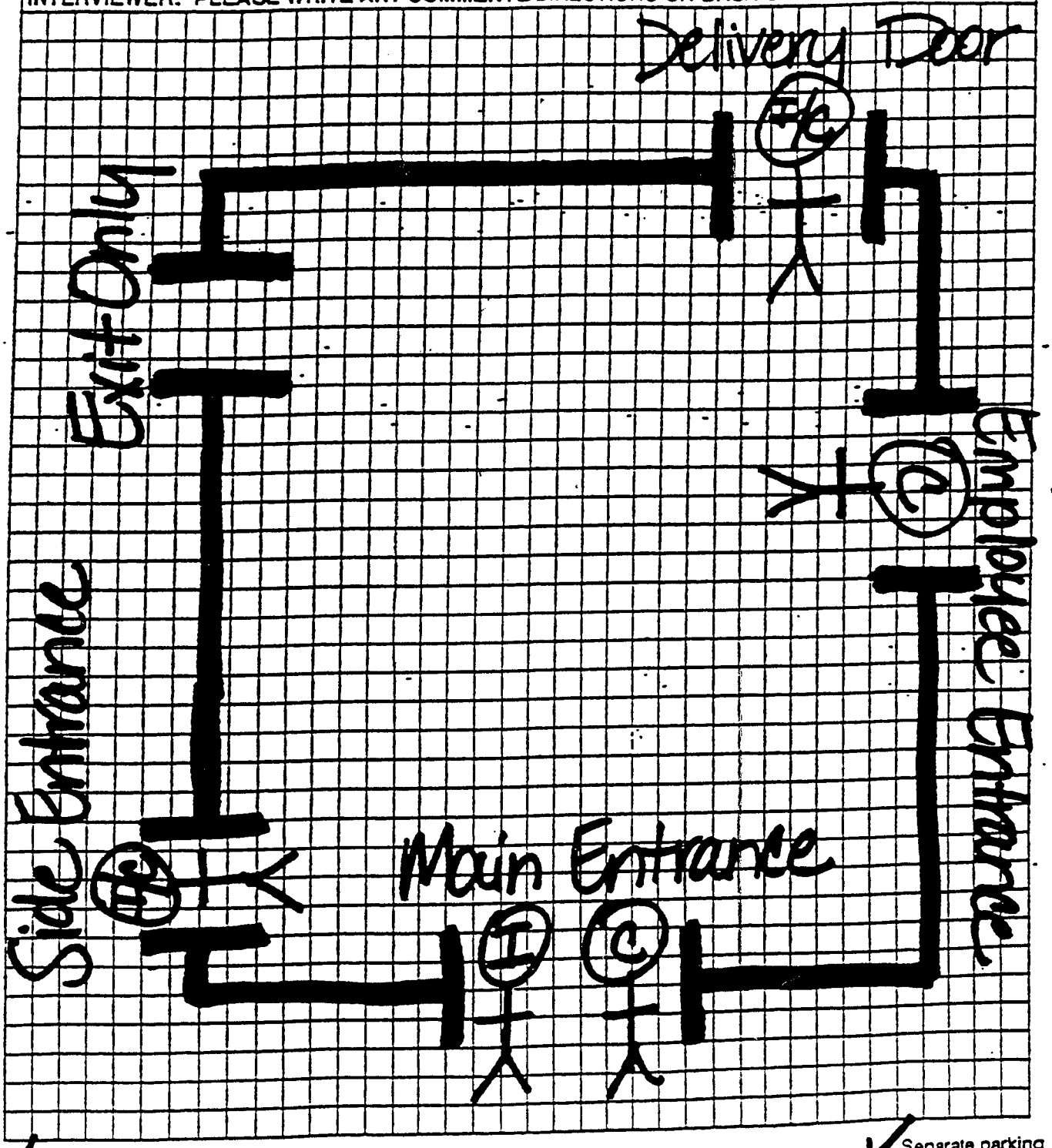
SITE/COMPANY NAME: SAMPLE

INTERVIEWER: SAMPLE

SITE/COMPANY STREETADDRESS:

DATE:

INTERVIEWER: PLEASE WRITE ANY COMMENTS/DIRECTIONS ON BACK OF THIS FORM



✓ FREESTANDING
— NON-FREESTANDING

— SHOPPING CENTER/MALL
— MULTI TENANT BUILDING
✓ STAND ALONE BUSINESS

✓ Separate parking
— On street parking
— Shared parking
✓ Cut through

II. ADMINISTRATIVE MATTERS

Before describing in detail what you will actually do during the survey, it is important to first explain some general rules and requirements. These are things that you should keep in mind before you get ready to conduct the survey.

A. Punctuality

It is essential that you report to work on time, and that you meet your supervisor as scheduled. Persons who fail to report on time will be dismissed.

B. Appearance

You will be facing the public daily when surveying employment sites. The willingness of people to respond to the survey depends a lot upon how you look. Therefore, you will be expected to present a neat appearance at all times. Your supervisor will discuss with you any special dress requirements.

C. Behavior

Be courteous! Be friendly! Your behavior is very important to the success of the survey. For instance, some people may want to continue talking to you after you have finished the interview, asking questions and discussing the study, or talking about other matters. You must not be distracted from your work, which is to go on to interview the next visitor. You must politely and professionally disengage from the conversation with the overly–friendly person in order to do your job.

In another instance, some visitors may not like the survey, and will tell you so. Reply politely, and suggest that the information from the workplace survey will help TxDOT and the cities in the Dallas - Ft. Worth area to maintain and improve the transportation system. If the person is abusive, or indicates that he or she does not want anything to do with the survey, say something like, "I am sorry," and "thank you" and go on to interview the next visitor. In any event, do not get involved in an argument.

There is a list of important contact names and telephone numbers for your use in case some member of the public wishes to contact the Texas Department of Transportation, NCTCOG, DART, or the T. That list is found in the Appendix to this document.

Please report any problems you may encounter to your supervisor as quickly as possible. If you are unable to contact your supervisor, please call 214/831-1206. Be prepared to give the following information when you call:

- Your name;
- Where you are (name of site and CBA ID #);
- Phone number from where you are calling;
- Your supervisor is;
- The problem.

D. Supervisors

A supervisor will be responsible for your performance. Your supervisor will meet you regularly in the field at pre–scheduled meeting places, may accompany you to the workplace, will supply you with your work assignments and materials, and will pick up materials that you have completed. If any problems arise while on site, your supervisor is the person to talk to regarding these problems. Your supervisor will observe you to review your work and ensure that you are following the required survey procedures.

E. Reporting of Time

You are responsible for your own daily time slip. Each person will have a time slip from his or her agency.

Daily approval

At the end of each day, you must get your supervisor to initial your start and end time in the margin beside that day on the time slip. (Since you may have a diffferent site supervisor from day to day, it is absolutely required that you get the initials of the supervisor assigned to your site EACH DAY)

IF YOU HAVE FAILED TO GET THE SITE SUPERVISOR'S INITIALS IN ANY PARTICULAR DAY, YOU WILL NOT BE PAID FOR THAT DAY'S HOURS UNTIL YOU CAN OBTAIN THE REQUIRED INITIALS.

Weekly approvals

In addition, at the end of each week, you must get your site supervisor to sign your time slip in the space provided for "approved" signatures. Each agency's slips are a little different, so ask your agency where signatures are required, if you have any questions. Your site supervisor will NOT be permitted to approve a previous day's hours which are not initialed by the site supervisor for that day.

IF YOU DID NOT GET YOUR SITE SUPERVISOR'S SIGNATURE BY THE END OF YOUR LAST SHIFT ON FRIDAY, WE CANNOT GUARANTEE YOUR PAYCHECK WILL BE AVAILABLE ON SCHEDULE.

WE MUST HAVE ALL APPROVED TIME SLIPS IN THE CBA MANAGEMENT OFFICE BEFORE 8 AM ON MONDAY, OR WE CANNOT POSSIBLY GET THEM PROCESSED BY THE NOON DEADLINE.

All original approved time slips must be turned in to your site superviser at the end of the week. Keep your copy of your time slip in case of questions about the time you turned in.

IF YOU HAVE ANY QUESTIONS ABOUT YOUR PAYCHECK, YOU MUST PRESENT YOUR COPY OF YOUR TIME SLIP BEFORE ANY CHANGES CAN BE MADE IN YOUR APPROVED TIME. DO NOT DISCARD YOUR COPY UNTIL YOU ARE SURE YOUR PAYCHECK AGREES WITH YOUR RECORDS.

Communication to agency offices

Your site supervisor will bring your original time slip into the CBA office for management approval and transfer to a group time sheet for everyone from your agency who worked during the week on the project.

The CBA management office will fax copies of the group time sheet to your agency by noon on Monday, in order for your agency to prepare your paycheck. CBA management will follow up the faxed group time sheet by delivering a packet containing the original individual time slips and the original group time sheet by noon Tuesday.

Paychecks

ASK YOUR AGENCY WHAT DAY AND PROCEDURE TO FOLLOW TO GET YOUR PAYCHECK. If you have questions about your paycheck, FIRST call your agency. They will have ALL your records and can research and answer your questions.

NO PAYCHECKS WILL BE DELIVERED TO ANY CBA OFFICE OR AND NONE WILL EVER BE AVAILABLE FROM A CBA REPRESENTATIVE. IN ADDITION, WE CANNOT ANSWER ANY QUESTIONS ABOUT PAYCHECKS EXCEPT THROUGH YOUR AGENCY'S REPRESENTATIVE.

F. Use of Personal Auto

Should you be required to use your personal auto to travel between employment sites during a particular assignment, you will not be reimbursed, as this is a normal expense incurred during your work assignment. Catherine Bryant & Associates, Barton-Aschman Associates, The North Central Texas Council of Governments (NCTCOG) and/or TxDOT will not be liable in the event of any accident occurring while you are working on this assignment.

You will not be reimbursed for travel to and from your home. Such travel is considered to be a normal commute which would be expected in any job.

III. DEFINITION OF TERMS

In this part of the instructions, we have defined some words which you will hear people use frequently during this survey. Some are critical to your understanding of your job.

- *TxDOT.* The Texas Department of Transportation. The agency which administers the state transportation system.

- *NCTCOG.* The North Central Texas Council Of Governments. The agency sponsoring the survey.

- *Trip.* A one-way movement from the origin of a trip to the destination of the same trip.

- *Origin.* The place a person first leaves from on the trip that they are making. (Think of the origin as the door of a building—their home, work, store, doctor's office—the person walked out of to begin their trip).

- *Destination.* The place a person goes to on the trip that they are making. (Think of the destination as the door of the building—home, work, store, doctor's office—the person walks into at the end of their trip).

- *Special Generators.* Employment sites which generate significantly higher trips than average sites (such as military bases, hospitals, or colleges). These sites have been deleted from the sample. If you encounter one, notify your supervisor immediately.

IV. DUTIES AND RESPONSIBILITIES

During the survey, you will be responsible for carrying out certain tasks. This section of the manual describes the duties and responsibilities of each of the survey team members; the supervisor, the visitor interviewer, and the counter.

A. Supervisors

Supervisors are responsible for assuring that all members of the crew are properly situated before the shift start time. Starting on time is extremely important for accurate results.

Your first duty when you arrive with the survey team at the workplace is to place the interviewers and person counters. You are responsible for the correct placement of the on–site surveyors as shown in the Site Plan. This plan lists the employment site

and entrances/exits which are vital to cover with counters and/or interviewers on the survey day. See Figure 4 for an example of a Site Plan.

After you have placed the counters and interviewers, visit the contact person listed on the Employer Information Form (See Figure 5) and remind them that a group will be interviewing visitors today. The Employer Information Form has information we require to complete the survey, such as the number of employees, hours that deliveries are permitted/ restricted, and other important information. This information will be already filled out when you receive the recruiting answer sheet. Verify the information on the sheet, and fill in any missing information during your conversation with the contact person.

Arrange with the contact person to have the Employee Travel Forms distributed as soon as possible to all employees at work on the survey day (Figure 6). For certain sites, the employee survey forms will have been delivered before the actual survey day. When you speak to the contact person, make sure they have distributed the forms. In most cases these forms will be distributed on the survey day and retrieved by the manager of the establishment. Make sure the contact person also receives an explanitory letter and an attendance form (Figures 7 and 8) and collect the attandance form before you leave at the end of the business day.

During the rest of the survey day you may be interviewing visitors, or counting people, relieving the other surveyors for their breaks, or answering questions and solving problems as they arise. You are primarily responsible for the correct completion of the survey for the site(s) to which you are assigned. When sites are small, you may be assigned more than one. In cases like this you will be traveling between sites to relieve surveyors, and check on their work.

EMPLOYER INFORMATION SHEET

WEEK SCHEDULED _____ SURVEY DAY _____ SECTION _____ # EMP HERE _____

CBA ID NO. _____

COUNTY _____ AREA TYPE _____ EMPLOYMENT TYPE _____ PHONE _____

CELL NO _____

AGREED _____

TYPE BUSINESS _____

WORKPLACE NAME _____

_____

ADDRESS _____

_____ AND _____

CITY _____ ZIP _____

NAME SR MGR _____ TITLE SR MGR _____

CONTACT NAME _____ CONTACT TITLE _____ PHONE _____

SECURITY GUARD _____ SECURITY PHONE _____

AM OPEN _____ PM CLOSE _____

ARE PICKUP/DELIVERY HOURS RESTRICTED _____

DELIVERIES FROM... _____ TO... _____

FULL TIME HERE _____

PART TIME HERE _____

SQUARE FEET FLOOR SPACE _____

Is transit subsidized _____

How much reimbursed _____

Is parking subsidized _____

How much reimbursed _____

Carpool/vanpool program _____

Type program _____

EST TEMPS NEEDED _____

ENG FORMS _____

SERIAL # START _____ END _____

_____ _____

_____ _____

_____ _____

SPANISH FORMS _____

START _____ END _____

DELIVERED _____ COLLECTED _____

NOTES

_____

DATE PREPARED 9/18/94 11:11 PM

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS
1994 EMPLOYEE TRAVEL SURVEY

The North Central Texas Council of Governments is sponsoring a survey of travel in the Greater Dallas-Fort Worth area. Please help by participating. Your answers will be kept confidential and will be summarized with others for analysis.

1. Company Name (write in): _____

2. Do you work here (check one): 1☐ Full-Time (40 hrs or more/wk) 2☐ Part-Time (less than 40 hrs/wk)

3. What time did you arrive at work today? ____:____ 1☐ AM 2☐ PM

4. Where did you LEAVE FROM to get to work today? (Check one) 1☐ Home 2☐ Other

5. What is the address of that PLACE?

_____ Address (or nearest intersecting streets) _____ (City) _____ (Zip Code)

6. How did you get to work today? (Check one)

1☐ I drove a car, pickup, truck, or van
2☐ Passenger in a car, pickup, truck, or van
3☐ By motorcycle
4☐ By taxi
5☐ By DART or "T" bus
6☐ By another type of bus
7☐ Walked
8☐ Biked
9☐ Other (Specify)_____

7. If you traveled to work by CAR, PICKUP, TRUCK, VAN, or MOTORCYCLE today, HOW MANY PEOPLE were in the vehicle, including yourself and children? _____ (enter number)

8. If you traveled to work by CAR, PICKUP, TRUCK, VAN, or MOTORCYCLE today, HOW MUCH did/will YOU pay to park?

I paid/will pay $_____ . _____ (If no parking cost paid, enter 0)

1☐ Daily 2☐ Weekly 3☐ Monthly 4☐ Other (Specify)_____

9. If you traveled to work by BUS, how did you get to the place where you boarded the first bus? (Check one)

1☐ By car, pickup, truck, motorcycle, or van 2☐ Walked 3☐ Other (Specify) _____

10. If you traveled by BUS, what method of payment did you use to board the bus? (Check one)

1☐ I paid cash of $ ____.____ 2☐ I used a pass (weekly or monthly) 3☐ Other (Specify)_____

11. How MANY MINUTES did it take to walk to your workplace from the place you got out of the last vehicle that brought you there? If you walked the entire trip, enter that time. (Check one)

1☐ Less than 1 Minute 2☐ 1-5 Minutes 3☐ 6-10 Minutes 4☐ 11 Minutes or More: _____ (write minutes)

Please answer questions 12-17 at the end of your work day today.

12. While you were at work today did you ever LEAVE for any reason and then return to work?

1☐ NO (Skip to Question 18 on back.) 2☐ YES (Continue with Questions 13-17.)

13. How many times did you leave work today and then return to work? (Write in total #.) _____

14. What was your main reason for leaving? (Check one for each time you left.)

	1st Time	2nd Time	3rd Time	4th Time	5th Time	6th Time
Break (Smoke, Walk, Bathroom...)	1☐	1☐	1☐	1☐	1☐	1☐
Work Related	2☐	2☐	2☐	2☐	2☐	2☐
Other	3☐	3☐	3☐	3☐	3☐	3☐

15. How did you get there?

Auto, Pickup, Truck, Van, Motorcycle	1☐	1☐	1☐	1☐	1☐	1☐
Bus or Transit	2☐	2☐	2☐	2☐	2☐	2☐
Walk	3☐	3☐	3☐	3☐	3☐	3☐
Bike	4☐	4☐	4☐	4☐	4☐	4☐
Other (Specify)	5☐ ____	5☐ ____	5☐ ____	5☐ ____	5☐ ____	5☐ ____

16. What TIME did you arrive back at work? (Circle AM or PM)

	AM	AM	AM	AM	AM	AM
	____ PM	____ PM	____ PM	____ PM	____ PM	____ PM

17. If Auto, Pickup, Truck, Van, Motorcycle: Enter number of people in vehicle on trip back to work (including yourself): ____ ____ ____

18. On your way in to work today, did you make any STOPS? (Check yes or no)

N☐ No, I traveled directly to work. (Skip to Question 20.)
Y☐ Yes (Answer Question 19.)

19. If you made any stops on your way in to work today, why did you stop? (Check as many as apply.)

1☐ Attend School
2☐ Work Related
3☐ Eat a Meal
4☐ Recreational, Social
5☐ Shopping, Buy Gas,...
6☐ Personal Business (Bank,Doctor,...)
7☐ Pick-Up/Drop-Off a Passenger
8☐ Other (Specify)_____

20. What time did you leave work yesterday (or your previous weekday at work)? ____:____ 1☐ AM 2☐ PM

21. After you left work yesterday (or the last weekday you worked), did you make any stops?

4☐ No (Skip to Question 22.)

1☐ Yes - WHY did you stop? (check as many as apply)

1☐ Attend School
2☐ Work Related
3☐ Eat a Meal
4☐ Recreational, Social
5☐ Shopping, Buy Gas,...
6☐ Personal Business (Bank,Doctor,...)
7☐ Pick-Up/Drop-Off a Passenger
8☐ Other (Specify)_____

22. After you left work yesterday (or the last weekday you worked), what was your final destination? (check one)

1☐ Home
2☐ Other Place

The following questions are for statistical purposes only:

23. How many total CARS, PICKUPS, TRUCKS, VANS, or MOTORCYCLES are available for use by members of your household, including your own vehicle? _____ (enter number)

24. Are you a licensed driver? 1☐ Yes 2☐ No

25. In total, how many licensed drivers are in your household, including yourself? (Write in number) _____

26. In total, how many members of your household work either full-time or part-time, including yourself? (Write in number) _____

27. How many PEOPLE live in your household (including yourself)? _____ (enter number)

28. What is your AGE? _____ (enter years)

29. What is your GENDER? 1☐ Male 2☐ Female

30. What was your total annual household income last year before taxes, including all the members of your household? (Check box)

01☐ Less than $10,000
02☐ $10,000-$14,999
03☐ $15,000-$19,999
04☐ $20,000-$24,999
05☐ $25,000-$29,999
06☐ $30,000-$34,999
07☐ $35,000-$39,999
08☐ $40,000-$49,999
09☐ $50,000-$74,999
10☐ $75,000-$99,999
11☐ $100,000 and above

THANK YOU FOR YOUR PARTICIPATION! PLEASE RETURN COMPLETED FORM TO SURVEY DROP BOX OR YOUR SUPERVISOR

MEMORANDUM

To: 1994 Travel Survey Participating Businesses
From: Emilie Fesq, Survey Consultant
Subject: Travel Survey, Employee Survey Forms, Attendance Forms

---

Thank you for agreeing to participate in the survey of employees in the Dallas-Fort Worth Metroplex. This survey will provide current data on the way that your employees now travel to work, and will be used to make forecasts of ridership to help determine improvements to the transportation system in the future. The enclosed employee questionnaires should be delivered to all employees at work on the survey day.

As our surveyor explained, it is vital that your employees keep track of all the trips that they make during the entire survey day, including their trip to work and the last trip they made from work at the end of the previous day. For our purposes, a trip is a one way segment of travel, such as from work to a restaurant for lunch. Going from the restaurant back to the workplace is a second trip.

Each employee at work on the survey day should receive a survey form, including part-time employees, mailroom and janitorial staff, contract or temporary employees, and employees of outside vendors who are working at your place of business on the survey day (eg. security guards employed by another company who guarded your place of business on that day).

If an employee is absent, they should NOT fill out the survey on another day. Only those people actually present and working at your place of business on the survey day should fill out forms.

Please encourage all your employees to fill out the forms. When you collect the completed responses at the end of the survey day, please hold them until our surveyor comes by to pick them up.

In addition, please use the enclosed Attendance Form to let us know how many employees and other persons were working at your place of business on the survey day. This will help us analyze the completed forms your employees turn in at the end of the day. We'll pick up the completed Attendance Form when we drop by to get the completed employee surveys.

YOUR SURVEY DAY IS:_____

ATTENDANCE FORM
1994 TRAVEL SURVEY

ESTABLISHMENT: _____ SURVEY DATE: _____

Please fill out the following information and return it to our survey representative. Thank you!

A. Full time employees attending work today _____

B. Part time employees attending work today _____

C. Any other persons working at this location today (eg. janitorial staff, security guards, temporary labor, contract labor, etc.) _____

D. TOTAL EMPLOYEES (A + B + C) _____

At the end of the survey day, you will pick up the completed employee travel forms from the contact person, collect and review the interview sheets from the visitor surveyors, and collect and review the count sheets from the people counters. Each form should be reviewed with a red pencil in hand with which to make corrections, clarify responses, and complete answers which have been inadvertently missed (such as filling in a missing am/pm designator).

After each interview sheet and count sheet has been collected and reviewed, place the following materials in the envelope, and complete the Site Check List taped to the outside of the envelope (Figure 9).

- Employer Information Form
- Employee Questionnaires
- Visitor Interview Sheets
- Person Count Sheets
- Commercial Vehicle Count Sheets
- Site Plan
- Attendance Sheet

SITE CHECK LIST

CBA# _____ ESTABLISHMENT NAME _____

DATE _____ ADDRESS _____

SHIFT [ ] MORNING SUPERVISOR NAME _____
[ ] AFTERNOON
[ ] NIGHT EDITOR NAME _____

NUMBER OF COUNTERS STATIONED AT THE FOLLOWING:

[ ] PUBLIC ENTRANCES
[ ] EMPLOYEE ONLY ENTRANCES
[ ] LOADING DOCKS/DELIVERY AREAS

THESE ITEMS SHOULD BE IN THIS ENVELOPE AT THE END OF THE SURVEY PERIOD:

[ ] VISITOR SURVEY SHEETS
[ ] PEOPLE COUNT SHEETS
[ ] VEHICLE COUNT SHEETS
[ ] ATTENDANCE SHEET
[ ] EMPLOYEE INTERVIEWS (OPTIONAL)

VISITOR SURVEYS: _____

PEOPLE COUNTED: _____

VEHICLES COUNTED: _____

EMPLOYEE SURVEYS: _____

CELL ID: _____

ARE THE VISITOR SURVEYS AND COUNT SHEETS IN THE ENVELOPE?

B. On–Site Surveyors

The on–site surveyors consist of counters, who count all commercial vehicles and all people who enter the establishment, and visitor interviewers, who ask questions of the non–employees who enter the establishment. Each day, the on–site surveyors will meet their supervisor at a prearranged location or at the survey site. Your supervisor will go over your assignment with you.

Study items

There are a few items which you will be responsible for having each and every day you are in the field:

Identification. You will be issued an identification badge (Figure 10) which confirms that you are allowed to conduct the survey. You must wear your identification badge at all times while conducting the survey.

Watch. A reliable watch should be worn while conducting the survey to eliminate inaccurate recording of times.

Change. You should carry at least $1.00 each day in quarters for use in making any necessary phone calls. Keep track of money spent on calls.

NAME BADGE

OFFICIAL SURVEYOR

Transportation Survey 1994

Interviewers

The interviewers will approach people who are about to enter the establishment and ask if they are an employee. If they are not, they are eligible to be interviewed.

Interviewing Equipment. If you are assigned to interview visitors to the site, you will be given the following equipment:

- *Interview Forms.* You will have visitor interview sheets which you will be given at the beginning of each shift. Always use the interview sheets given to you by your supervisor, never use the ones you used on another day or at another location. An example of the visitor interview forms is shown in Figure 11.

- *Pencils.* You will be given sharpened pencils for use during the survey.

- *Clipboard.* You will be given a clipboard for holding the forms. Each clipboard has an important show card taped to its back, shown in Figure 12.

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS
1994 VISITOR TRAVEL SURVEY INTERVIEW FORM

(ONLY IF NECESSARY) The North Central Texas Council of Governments is sponsoring a survey of travel in the Greater Dallas-Fort Worth area. Please help by participating. Your answers will be kept confidential and will be summarized with others for analysis.

CBA #:_____

Date:____/____/94

Location:_____

Int:_____

Questions	Person 1	Person 2
A. Are you a visitor or do you work here at [illegible]?	[illegible]	[illegible]
B. RECORD time (circle AM or PM):	___:___ AM PM	___:___ AM PM
C. Where did you come from to get to [illegible] today?	☐ Home ☐ Other _____ (work, shop...)	☐ Home ☐ Other _____ (work, shop...)
D. What is the address of that location? (or nearest intersecting streets, city & zip) (or place name and street, city & zip)	_____ (Place Name) _____ (Address) _____ (City) _____ (ZIP)	_____ (Place Name) _____ (Address) _____ (City) _____ (ZIP)
E. WHY did you come to [illegible] today? (See Code List E)	Code/Specify:_____/_____	Code/Specify:_____/_____
F. How did you travel here to [illegible] today? (See Code List F)	Code/Specify:_____/_____	Code/Specify:_____/_____
IF WALK, SKIP TO QUESTION N. G. How long did it take you to walk from where you got out of the vehicle?	Minutes: _____	Minutes: _____
If by Car/Pickup/Truck/Van/Motorcycle ask: H. HOW MANY PEOPLE were in the vehicle, including yourself and all children?	Enter #: _____	Enter #: _____
I. HOW MUCH did/will you, yourself, PAY TO PARK to visit [illegible]? (If no parking cost paid, enter 0)	Paid/will pay: $_____._____ (amount) ☐ By Meter ☐ Daily ☐ Hourly ☐ Monthly ☐ Other _____	Paid/will pay: $_____._____ (amount) ☐ By Meter ☐ Daily ☐ Hourly ☐ Monthly ☐ Other _____
J. How much of the parking cost you just mentioned was or will be REIMBURSED by someone else? (If none, enter 0)	$_____._____ (amount)	$_____._____ (amount)
If by Bus ask: K. HOW did you get to your first bus stop? (See Code List K)	Code/Specify: _____/_____	Code/Specify: _____/_____
L. HOW did you PAY? (Show card on back of clip board)	Code/Specify: _____/_____	Code/Specify: _____/_____
M. How much of the transit cost you just mentioned was or will be REIMBURSED by someone else? (If none, enter 0)	$_____._____ (amount)	$_____._____ (amount)
If by Walk ask: N. How many minutes did it take you to walk from your last destination?	Minutes: _____	Minutes: _____
O. How many other businesses did you visit within this building/center before arriving here? (If none, enter 0)	Enter #: _____	Enter #: _____

Code List E - Trip Purpose

1) Work related
2) Eat a meal
3) Shopping, buy gas...
4) Social, recreational
5) Personal business (Bank, Doctor, Mail, Legal)
6) School
7) Pick up/drop off passenger
8) Pickup/drop off delivery/parcel
9) Other ____ (Specify)

Code List F - Mode

1) Drove car, pickup, truck, van
2) Passenger in car, pickup, truck, van
3) Motorcycle
4) Taxi
5) DART/"T" bus
6) Other type of bus
7) Delivery vehicle
8) Walked
9) Biked
10) Other ____ (Specify)

Code List K - Bus Mode

1) Walked
2) Biked
3) Motorcycle
4) Taxi
5) Car, pickup, truck, van and was dropped off (Specify number in vehicle)
6) Car, pickup, truck, van that parked near the bus (Specify number in vehicle)
7) Other ____ (Specify)

ANSWER TO QUESTION L

1. I paid CASH fare of $_____ (Please specify)
2. I used a LOCAL WEEKLY PASS
3. I used a LOCAL MONTHLY PASS
4. I used an EXPRESS WEEKLY PASS
5. I used and EXPRESS MONTHLY PASS
6. I used a LOCAL PUNCH TICKET
7. I used an EXPRESS PUNCH TICKET
8. I used a SENIOR/DISABLED PASS
9. I used a CHILD/STUDENT PASS
10. Other (Please specify) _____

The following checklist defines the interviewer's daily responsibilities:

- Pick up work assignment from supervisor.
- Locate the correct entrance at employment site. This might not be a physical entrance, but an invisible plane which people cross.
- Start interviewing the first person (with a big smile!).

You can say something like this:

Hello, my name is _____. Do you work at (INSERT NAME OF SITE)?

If they do, remind the employee to fill out their survey form. If the person does **not** work there, conduct the visitor interview.

Continue the interview. Notice that you do NOT begin by saying "Can I ask you a few questions?" Begin with the first question immediately.

If the person wants to know what the study is about, say something like this:

The Texas Department of Transportation and NCTCOG (The North Central Texas Council of Governments) are conducting a survey to find out more about how people travel. Your participation in this survey will help improve the transportation system throughout the Dallas and Ft. Worth Metroplex area. Right now I'd just like to ask you a few questions; it will only take a minute.

Counters

Individuals will be stationed at one or more entrances to the workplace. The counters will count every single human being crossing the entrance to the establishment. This may be a driveway on some some sites or it may be a doorway on other sites. Notice that delivery persons are counted separately from all other persons. An example person count sheet is shown in Figure 13.

There will also be counter(s) who are responsible for counting all commercial vehicles. This individual must also administer the visitor interview to any entering personnell not employed at the establishment surveyed. (ex: FedEX man or a messenger are visitors). An example of the commercial vehicle count sheet is shown in Figure 14-16.

All counts (person and commercial vehicles) are recorded separately for each hour.

Counting Equipment. If you are assigned to count, you will be given the following equipment:

- *Count Sheets.* You will have a count sheet on which to record the number of vehicles or people who enter and exit the site in each hour.

- *Hand–held tabulator.* You will be given a hand held counter with which you will count the people entering the site.

- *Pencils.* You will be given sharpened pencils

- *Clipboard.* You will be given a clipboard.

Site Name _____ CBA # _____ Entrance Number _____

Time	Number of Persons Entering (Including Employees but not Delivery Personnel)	Number of Delivery Personnel Entering
6 AM - 7 AM		
7 AM - 8 AM		
8 AM - 9 AM		
9 AM - 10AM		
10AM - 11AM		
11AM - 12PM		
12PM - 1 PM		
1 PM - 2 PM		
2 PM - 3 PM		
3 PM - 4 PM		
4 PM - 5 PM		
5 PM - 6 PM		
6 PM - 7 PM		
7 PM - 8 PM		
8 PM - 9 PM		
9 PM - 10PM		
10PM - 11PM		
11PM - 12AM		

DATE: _____ Intv NAME _____

Interviewer _____ NAME: _____

Entrance # _____ Date _____

COMMERCIAL VEHICLES 6AM - NOON			6am - 7am	7am - 8am	8am - 9am	9am - 10am	10am - 11am	11am - 12pm	Comments
	CAR, MOTORCYCLE, BICYCLE								
	PANEL & PICKUP TRUCK								
TRUCKS — SINGLE UNIT TRUCKS	2 AXLE, SIX TIRE (e.g. Various trucks, campers, ambulances, and tow trucks)								
TRUCKS — HEAVY VEHICLES	LARGE, HEAVY VEHICLES HAVING 3 OR MORE AXLES (e.g. Large trucks, Truck & trailer combinations)								
	TOTAL								

SEE OTHER SIDE FOR NOON - 6pm

Interviewer _____ NAME: _____

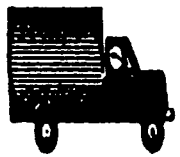
Entrance # _____ Date _____

COMMERCIAL VEHICLES Noon - 6pm			12pm - 1pm	1pm - 2pm	2pm - 3pm	3pm - 4pm	4pm - 5pm	5pm - 6pm	Comments
CAR, MOTORCYCLE, BICYCLE									
PANEL & PICKUP TRUCK									
SINGLE UNIT TRUCKS	2 AXLE, SIX TIRE. (e.g. Various trucks, campers, ambulances, and tow trucks)								
HEAVY VEHICLES	LARGE, HEAVY VEHICLES HAVING 3 OR MORE AXLES (e.g. Large trucks, Truck & trailer combonations)								
TOTAL									

SEE OTHER PAGE FOR 6AM - NOON

Intersection _____ Interviewer _____ NAME _____

Entrance # _____ Date _____

COMMERCIAL VEHICLES 6 PM - MIDNIGHT			6pm - 7pm	7pm - 8pm	8pm - 9pm	9pm - 10pm	10pm - 11pm	11pm - 12am	Comments
CAR, MOTORCYCLE, BICYCLE									
PANEL & PICKUP TRUCK									
TRUCKS — SINGLE UNIT TRUCKS	2 AXLE, SIX TIRE (e.g. Various trucks, campers, ambulances, and tow trucks)								
TRUCKS — HEAVY VEHICLES	LARGE, HEAVY VEHICLES HAVING 3 OR MORE AXLES (e.g. Large trucks, Truck & trailer combinations)								
TOTAL									

The following checklist describes the counter's responsibilities.

- Pick up work assignment from supervisor.
- Locate the proper entrance or driveway.
- Begin counting every commercial vehicle arriving at the workplace or person entering the workplace. Do not worry if the person walks right back out of the building. If the person or vehicle breaks the plane of the entrance (just like an endzone in football or the light beam of an electronic sensor), they are counted.
- Continue counting until the end of your shift.
- Record the final count on the appropriate Count Sheet.
- Give your supervisor the completed Count Sheet.

V. GENERAL COMMENTS

The following suggestions will help you conduct the survey properly:

Courtesy to the Visitors. It is an important part of your job to deal with visitors in a friendly and courteous way. As people walk toward the entrance you are covering, greet them with a "good morning" or "good evening" and say that you are conducting a survey for the Texas Department of Transportation and the North Central Texas Council of Governments. If they ask you what the survey is for, tell them that it is a survey to improve the transportation system in the Dallas and Ft. Worth Metroplex and find out more about the travel to and from employment centers in the area.

Refusals. As discussed earlier, one of the problems that you are going to have to deal with is that some visitors will not want to be interviewed or they will be curious to know why they are being asked the questions. When this happens, explain to them that the results of the survey will be confidential and ask them to help the Dallas and Ft. Worth Metroplex plan for better transportation service.

Information to Give When Calling In. If you call 214/831-1206 (24 hours a day) with a problem, please give the following information:

- Your name,
- Where you are,
- Phone number you are calling from,
- Assignment number you are on,
- What the problem is.

This will help speed the answers to your questions.

APPENDIX

WORKPLACE SURVEY CONTACTS

North Central Texas Council of Governments (NCTCOG):

- Travel Survey Manager: Ken Cervenka
  - Transportation Department Phone Number, (817) 695-9240
  - Transportation Department Fax Number, (817) 640-3028
  - Ken Cervenka's Direct Office Phone Number, (817) 695-9266
  - Ken Cervenka's Emergency Home Phone Number, (214) 620-2468
  - Ken Cervenka's Emergency Home Fax Number, (214) 620-2404

- Director of Public Affairs: Edwina Shires
  - NCTCOG Phone Number, (817) 640-3300
  - NCTCOG Fax Number, (817) 640-7806 (and alternative Fax number for Ken Cervenka)

- Travel Survey Assistant: Paul Cauduro
  - Paul Cauduro's Direct Office Phone Number, (817) 695-9261

TxDOT Regional Planning Office (RPO) in Arlington, Texas:

- Director: Mark Young (for confirmation that NCTCOG is a legitimate organization)
- Office Phone Number, (817) 640-6031

TxDOT Public Information Offices:

- Dallas District (Collin, Dallas, Denton, Ellis, Kaufman, and Rockwall Counties)
  - Coordinator: Mark Ball
  - Office Phone Number, (214) 320-4480
  - Office Fax Number, (214) 320-4488

- Fort Worth District (Johnson, Parker, and Tarrant Counties)
  - Coordinator: Bill Page
  - Office Phone Number, (817) 370-6630
  - Office Fax Number, (817) 370-6690

Dallas Area Rapid Transit (DART):

- (214) 749-3278 (general number for bus service questions/complaints)

Fort Worth Transportation Authority (The T):

- (817) 871-6200 (general number for bus service questions/complaints)

CITY OF NEW ORLEANS 1993 VISITOR SURVEY

MANUAL
OF
INSTRUCTIONS

PREPARED FOR

NEW ORLEANS
REGIONAL TRANSIT AUTHORITY

BY

BARTON-ASCHMAN ASSOCIATES, INC.

November 1993

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I. INTRODUCTION

This booklet provides instructions on how you are to conduct a survey of visitors to the New Orleans area. The survey will be conducted on weekdays and weekends in November, 1993. Please read and study this document thoroughly. In order to help you do your job more efficiently, this booklet contains a description of the purpose of the survey, and what you have to do during the survey.

Purpose of the Study

The purpose of this study is to obtain information on the beginning and end points of trips made by tourists and business visitors in the New Orleans area. The survey will provide valuable information on travel behavior and demographic characteristics of the people making trips. These data will be used to create a transportation model of the area to assess how well the highway and transit systems are working, and what would happen if changes were made in the future.

Participants in the Study

Over the survey period, you will be part of a small group of people who will participate daily in conducting the survey. Interviewers from this group will be stationed at various hotels and motels to interview groups of people traveling together as they check out in the morning. Your job is the most important part of the project. This study is only as good as the data. Please keep this in mind as you conduct the survey.

Duration of the Study

The survey will be conducted over a seven day period in November, 1993. Interviews will be conducted from 6:00 am in the morning until 6:00 pm. Thirty-seven hotels have agreed to participate in the survey, these hotels and motels are geographically distributed around the New Orleans metropolitan area.

Tasks

During the survey, you will be responsible for carrying out the tasks listed in Table 1. These tasks will be explained to you in this manual.

TABLE I
VISITOR SURVEY CHECKLIST

- Pick up work assignment from supervisor.

- Prepare the Hotel Data Sheet with the name of the hotel that you've been assigned for the day (see Figure 1).

- When you enter the hotel, greet the desk personnel and ask them to fill out the Hotel Data Sheet.

- Once at place in the hotel, put up your tourist map board and "Survey Today" sign in an obvious spot.

- Interview travel parties who are checking out or waiting in the lobby:
  - Place a serial number on the visitor data sheet (Figure 2) <u>and</u> the same serial number on the travel diaries for that party (Figure 3).
  - If all members of one party (staying in the same room) traveled on <u>each trip together</u>, you may interview just one member.
  - If any member was not with the party on <u>any one trip</u>, fill out a completely separate travel diary for that member, copying the trips that were made together with the party if necessary.
  - Ask the income question <u>last</u> and use the income card.
  - When the interview is complete, staple the visitor data sheet and the travel diaries for all members of the party together and place that packet in your envelope.

- When interviewing is concluded, spend a few minutes and check the visitor data sheets and travel diaries for completeness. Make sure:
  - The same serial number is written on the visitor data sheet and travel diaries for the same party.
  - All information is filled out completely.
  - The completed hotel data sheet is returned and placed in the envelope for that hotel.

Thank the desk personnel and return the materials to your supervisor.

What is a Trip?

It is important that you understand what a trip is, so that you can explain it to the travel party members who respond to the survey.

A trip is any one-way (not a round-trip) vehicular travel for a specific purpose, or a walk or bicycle trip which leaves the block of origin. Each trip consists of an origin, a destination, and a purpose (even if the purpose is just for recreation). If, for example, on your way to work, you stopped at the school to drop off your child, that is one trip. Continuing your travel from the school to your place of work is a second trip. If you leave work in the morning to go to the Post Office, that is a third trip, back to work is a fourth trip, to a restaurant to have lunch is a fifth, back to work is a sixth trip; and so on.

II. ADMINISTRATIVE MATTERS

Before describing in detail what you will actually be doing during the survey, it is important to first explain some general rules and requirements. These are things that you should keep in mind before you get ready to conduct the survey.

Punctuality

It is essential that you report to work on time. Persons who fail to report on time will be dismissed.

Appearance

You will be facing the public daily during the survey. The willingness of people to respond to the survey depends a lot upon how you look. Therefore, you will be expected to present a neat appearance.

Demeanor

Be courteous and be friendly! Your behavior is very important to the success of the survey. Getting people to participate in the interview is paramount to the success of the survey. For instance, some visitors will not like the survey, and will tell you so. Reply politely, and say that their participation will help Regional Transit Authority plan for transportation improvements--that is, better bus and streetcar service, future improvements that will benefit everybody in New Orleans.

If the person is abusive, or indicates that he does not want anything to do with the survey, say something like, "I am sorry," and "thank you, anyway." In any event, do not get involved in an argument.

Please report any problems you may encounter to your supervisor as quickly as possible. If you are

unable to contact your supervisor, please call 581-1303 and ask for room 548. Be prepared to give the following information when you call:

- Your name;
- Where you are;
- Phone number from which you are calling;
- Hotel at which you are interviewing;
- What the problem is.

Supervisors

A supervisor will be responsible for your performance. You will meet your supervisor regularly in the field drop off completed materials and pick up new assignments. If you have problems, your supervisor is the person to talk to regarding these problems. Your supervisor may observe you from time to time to review your work and ensure that you are following the required survey procedures.

III. SURVEY EQUIPMENT

The Interviewer's Kit

Each day you will be provided with a kit of materials which are needed to conduct the survey. These materials will be given to you to use as part of a kit.

1. *Identification*
   You will be issued an identification badge which shows that you are allowed to conduct the survey the establishment. You must wear your identification badge at all times while conducting the survey.

2. *Clipboard*
   Each kit will contain a clipboard, and a questionnaire dispenser for you to use during the course of your assignment.

3. *Visitor Data Sheets and Travel Diaries*
   Your kit will contain enough visitor data sheets and travel diaries for an entire day's work. Each party that you interview must have a visitor data sheet and at least one travel diary filled out before the interview is complete.

4. *Surveyor's Logs*
   A log as shown in Figure 4 will be included. The following information will be written for each day you are stationed at a hotel:

   - Hotel/Motel name.

- Survey Location Serial Number.
- Start and end time of the survey period.
- Date.

5. *Return Envelopes*
   Return envelopes will be included for the surveys. The envelopes are to be used for storing returned survey forms and completed hotel data logs.

6. *Plastic Sack*
   A carrying sack will be provided to carry each kit. The entire kit should be enclosed in this bag to keep the materials together in one place and dry.

7. *Watch*
   A reliable watch is necessary while conducting the survey

8. *Change*
   You should carry at least $2.00 each day in quarters for use in making phone calls to your supervisor.

IV. SURVEY PROCEDURES

These are the most important steps for you to follow to successfully do your work. Please review these before you start each day's assignment.

Pick Up Work Assignment
Each day you will meet your supervisor at a prearranged location to pick up your work assignment. Your supervisor will give you the survey location assigned to you for the day, and will go over your assignment with you.

Establish Rapport with Staff
While the hotel/motel manager is aware of the survey, it is a good idea to introduce yourself to the desk personnel when you arrive. You will have a copy of the letter sent by the Greater New Orleans Tourist and Convention Commission which was sent to the manager to introduce the survey. Gaining the cooperation of the staff will greatly help you in conducting the interviews.

Be sure to wear your identification badge where it can be easily seen.

After you have taken your materials out of the kit, place the sack containing the unused materials behind the check-in counter or in an unobtrusive place. After you have completed these steps, you will be ready to begin surveying hotel guests.

Data Collection Procedures

You will be required to perform the following tasks:

1. Intercept persons checking out of the hotel/motel.

2. Interview persons agreeing to be surveyed.

3. Record the serial number of the interview on both the visitor data sheet and the trip diaries for that party.

The following sections describe the overall procedures and some special problems.

Procedures
These steps illustrate the procedures you will be following in the visitor survey:

- First locate the assigned hotel. Ample lead time will be provided in your schedule.

- Check in with the hotel desk personnel or the shift manager.

- Install all necessary equipment.

- Place the "SURVEY TODAY" sign at the front desk or near your tourist map board.

- Your survey work begins with the first person checking out. You will have already entered the serial number of the first survey questionnaire on the log. Approach the person, identify who you are working for and ask if they would participate in the survey. Indicate that it is completely confidential and that it will take about five minutes.

- If a patron declines to participate, move on to the next person.

- At the end of the survey period, place the hotel data sheet along with the completed questionnaires in the envelope.

End of Survey Period
You will repeat the steps described above until the survey period is over. At the end of your shift, take a few minutes to check that the visitor sheets and travel diaries from your interviews that day are completely and correctly filled out. Make sure that you have put the serial numbers on both forms, and that the hotel data sheet is complete.

You should put the following items into the return envelope for each hotel: all the completed visitor data sheets and travel diaries, and the completed hotel data sheet. Close the envelope with the attached clasp, but do not seal the gummed flap.

General Comments

The following suggestions will help you conduct the survey properly:

- **Courtesy to the Patrons.** It is an important part of your job to deal with the hotel patrons in a friendly and courteous way when you approach them for the interview. Greet them with a "good morning," and say that you are conducting a survey for the Regional Transit Authority. If they ask you what the survey is for, tell them that is a survey to improve the city's transportation services.

- **Refusals.** As discussed earlier, one of the problems that you are going to have to deal with is people refusing to participate. When this happens, explain to them that the results of the survey will be confidential and ask them to help the RTA plan for better service. If they flatly refuse, move on to the next person.

- **Encouragement to Respond.** It is part of your job to encourage the people to respond to the survey. Each visitor that you survey can represent up to 100 other people, so their participation is extremely important. The answers that they give will be combined with other visitor's answers, and are used solely for statistical purposes and in computer models used to improve the transportation system in the New Orleans metropolitan area. Their name does not appear on the interview form, and their answers are completely confidential. You will get the best response by acting in a friendly yet professional manner.

Conducting the Interview

When you approach the first person, you should already be familiar with interviewing the guidelines in this section.

1. Introduce Yourself

The first step of the interview is to introduce yourself by giving your name and saying that you are representing the RTA Visitor Survey. Indicate your identification badge and use an introduction similar to the following:

> I am _____ from the RTA Visitor Travel Survey. We are making a travel survey in the New Orleans area, and I would like to obtain the information about your travel yesterday in the New Orleans area. These questions should only take about five minutes and the results are completely confidential.
>
> Note: If the person was not in New Orleans for a full day yesterday, the first trip you write down in the travel diary is from the airport to wherever they went (the hotel, business, restaurant, etc.). All persons who stayed <u>last night</u> in the hotel are eligible to be interviewed.

2. Ask the First Question As Soon As Possible

After introducing yourself, continue immediately with the filling out of the visitor data sheet--that is, ask "What is the primary purpose of your visit to the New Orleans area? Are you here for a convention, other business, as a tourist? etc". Have the form ready before you approach the person. The sooner you get the respondent to continue in the interview, the better. Starting off with the questions and answers is much more desirable than trying to describe the types of questions you are planning to ask.

If you are asked why you are interviewing this particular person, explain that selection is random and assure them that the selection had nothing to with them personally. If it is necessary for you to give additional information, base it on your knowledge of the survey and use your own words. If you do not know the answer, tell the respondent you will refer the question to your supervisor if they would like.

Sometimes you will get an answer that does not furnish the kind of information you need or that is not complete. In such instances, you should ask additional questions, being careful to get the person to explain, without you suggesting what the answer should be. The interviewer should always be satisfied that the most complete and accurate answers have been obtained to all questions.

The above is especially important when completing the trip report for each person. A person may describe travel that he or she considers one trip, but which is actually several trips in terms of the definition of a trip used in this study. An example of this would be a trip that has intermediate stops, with the different purpose for each of the different segments of the trip. Also, a respondent may give you all the trips he or she remembers making on the travel day, but leave out some small trip that he or she would not consider as important. For example, he or she might have made a trip to the drug store at 9:00 P.M. to get some throat lozenges, or from the airport to a drive-through hamburger stand. It is important for the interviewer to be certain that all trips are surfaced and recorded.

In asking additional questions, both to get clarification or explanation of an answer or to assure yourself that all trips have been mentioned, be careful not to suggest a particular answer to the question. Some general phrases that can be used without leading the respondent are below:

1. Please explain that a little more.

2. You went directly to the...

3. I'm not sure I understand. Would you explain that again?

3. Asking Questions

Follow the order of the questions on the survey forms and do not skip around. The wording and

order of the questions have been tested to give the desired information. So ask them the way you have been taught in your training.

A person may not always understand the question when it is first asked. If you sense from the answer that he or she does not understand, repeat the question in the same way you did at first, as politely as you can.

In most cases, you will need to fit your questions to the situation and the information you have been given. People often forget or overlook a trip that they made. A good interviewer must sometimes follow-up a response with a probing questions. The following is an example of an appropriate and an inappropriate probe:

Acceptable (Does not suggest a particular answer)	Not Acceptable (Suggests a particular answer)
On your way from the aquarium yesterday, did you make a stop for any reason along the way?	Did you do any shopping on your way back from the aquarium yesterday?

4. Party Members Not Present

If a member of the party is not present for the interview, the person being interviewed may respond for that person.

5. Other Hints

After you have asked a question, listen to the person until he or she is completely finished giving an answer. Do not interrupt before the person has finished, especially if he or she hesitates. Hesitation often means that a person is trying to recollect some fact, and he or she should be allowed to do this. Also listen and do not write while the respondent is giving the answer. Wait until after he or she has finished to record the reply. Otherwise, you may miss an important fact. At the end of the reply, you can then ask for clarification or for the respondent to repeat part of the answer, if necessary.

6. Confidentiality

The information you collect on this survey is confidential and is to be used only to generate statistical summaries for transportation planning in the New Orleans area. Any information you collect must be kept confidential, and you must not discuss it with anyone other than those working on the survey.

7. Refusals

If someone does refuse to be interviewed, try to find the reason. If a person questions why the survey is being done, explain its purpose and stress that all results are confidential. Be as factual, concerned and businesslike as possible. Do not get into an argument or take the refusal as a personal affront. If the person still refuses, end the conversation politely.

8. Questions/Complaints/Comments by Members of the Party

Persons in the travel party may have questions, complaints, comments, or suggestions about the survey or about transportation in the area. It is not your job to answer these questions or to get into debates or arguments about them. Be polite yet firm if such a situation should arise and suggest that they put their concerns into writing to:

Regional Transit Authority
6700 Plaza Drive
New Orleans, LA 70127

Try to avoid leading the respondent by adding something to the question, but you may have to give some explanation if asked in order to collect the requested data.

It is important that you maintain as objective an attitude as possible. Do not indicate a personal opinion about answers to questions, by your words or tone of voice. Although you must remain objective, you should still be friendly and courteous. Maintain a businesslike attitude with a friendly manner.

9. Review Your Work

The completed interview forms will be checked and rechecked a number of times before the information is tabulated. The most important check, however, is the one you do as soon as you finish your interview. Take a few moments to go over each form to make sure that all the information is complete, each question is answered, and you are satisfied with the answers.

10. Recording the Information

Recording the information accurately is as important as asking the questions properly. You should write all responses in pencil, clearly and distinctly, adjusting your writing to the amount of space you have. If additional space is needed, make use of the comments space on the forms. If a change is required, erase the original answer and make a new entry. Avoid copying the questionnaire over, as this is time-consuming and can be a source of error.

11. Some Don't's

Although you should try to feel as comfortable and relaxed as possible during the interview, you should remember that you are there to complete a specific task and all your concentration will be needed to perform it properly. With this in mind, the following are some things you may not do during the interview:

- You are not allowed to combine this work with any other occupations or interests, such as selling, distributing materials, or advertising.

- You are not allowed to engage in any activity or discussion that is not directly related to the interview.

Remember that one of your main goals as an interviewer is to conduct yourself in a businesslike manner and to handle all questions and situations in the same way so that results will be uniform from interview to interview.

How to Fill Out the Survey Forms

The Visitor Data Sheet
The interview forms consist of 8 1/2 x 11-inch sheets. The "face sheet" or visitor data sheet is the first sheet and is used to collect information about the travel party.

The top of the visitor data sheet has a place to write in the Hotel/Motel name and the travel day. Remember that you are asking questions about the persons travel YESTERDAY, so if it is Saturday the Travel Day is Friday. Mark the appropriate box. The serial number is a number you assign to each separate interview, and is written on the visitor data sheet and all travel diaries for each member of that travel party.

Question 1: What is the primary purpose of your visit to the New Orleans area?
Most people will be here for a convention, on business, as a tourist, or visiting friends. If the reason that the person gives doesn't fit into one of these categories, mark "other" and explain.

Question 2: How many persons are in your party? (Staying in your room tonight)
Simply write in the number of persons staying in one hotel room in the space provided. Remember that only persons staying together in one room constitute a travel party.

Question 3: How many persons in this party are sixteen years of age and older?
Write the number on the line to the right of the question. Age refers to age as of the last birthday.

Question 4: Do you have an automobile available for your use in New Orleans?
This is simply a "yes" or "no" question.

Question 5: How many nights will you be staying in New Orleans?
There are six possible answers here, one through five nights and more than five nights.

Question 6: How did you travel to New Orleans?
There are four possible answers to this question.

Question 7: How will you leave New Orleans?
See above.

Question 8: How often do you visit New Orleans?
There are six possible answers to this question, including an "Other" which you should explain if the given choices do not apply.

Person Data
Space has been provided for recording data for 4 persons, sixteen years of age or older, per travel party. Should additional spaces be required (in case there are more than 4 party members), use an additional Visitor Data Sheet. This will be a rare occurrence, because a travel party consists of people staying in the same room at the hotel. If a family of two parents and two children 16 years or older are traveling together, but the parents have one room and the children have another, that is two travel parties. However, if a second form is used, you must:

1. Copy the hotel name, travel day, and serial number of the original form into the identical spaces on the second form.

2. Copy the information recorded in Section I, questions 1-8 of the original form into the identical spaces on the second form.

3. Renumber the person numbers appearing in question 9, Person Data, of the second form, by crossing out the "1" and writing a "5".

The Head of the Party

The adult person that you are interviewing will be the head of the party. Write in the other travel party members relation to the head of the party, such as "husband", "wife", "son", "daughter", "friend", or "other relative".

Age

Write the respondent's answer to this questions in the appropriate space. Enter the age as of last birthday for each person listed; if exact age cannot be obtained, enter the best estimate. Sometimes age is a sensitive question, and in that case accept an approximate age such as a five year interval. For example, "Could you tell me if you are between 20-24, 25-29, 30-34, 35-39, etc." The midpoint of the age interval is then entered, e.g., 20-24 = 22.

Sex

Do not ask the respondent this; obtain the answer by observation. Circle "1" for male or "2" for female for each person listed in Column "A". Confirm again II-C, relationship to head (except for unrelated).

Licensed to Drive?

If the respondent or a household member has a driver's license, circle "Yes," if not, circle "No."

Occupation

Ask the respondent his or her occupation, and obtain this information for each member of the travel party.

The Travel Diary

The travel diary is the meat of the interview. On this form you will fill out information on each trip that the travel party made in the New Orleans area on the previous day. Use as many travel diaries as needed.

Space has been provided on the Travel Diary for recording trip information for nine trips. Should additional space be required, use additional Travel Diaries. If a second form is required, transcribe the same serial number on the second form.

A separate Travel Diary must be filled out for each person in the party 16 years of age or older making trips separate from the travel party. That is, if the travel party started out together in the morning, went to a restaurant for breakfast, went to the Waterfront, and then one member 16 years or older left the party, went shopping while the other member(s) went to the aquarium, then a separate travel diary must be filled out for the member that made separate trips. This separate travel diary will include <u>all</u> the trips made with the party, and all the trips made separately.

It is imperative that the interviewer be constantly alert for signs that indicate travel the respondent has not recalled. You will learn to ask additional questions to remind the respondent of trips he or she may have forgotten. If we overlook just one trip, the loss represents almost 1,000 trips because we are only taking a sample of visitors. One Trip Report will be prepared for each visitors member age 16 and older making trips on the travel day. Thus for a father and mother and 16 year old son, each of whom made separate trips on the travel day. A Trip Report would be prepared for each; a total of three trip reports for the party.

Be alert to party members who are not in town for business (i.e. question 1 was "tourist"), but who list work trips. Ask tactful questions to determine what kind of work (e.g. part-time, volunteer) or clarify the purpose of their visit to New Orleans.

It is not necessary to obtain the trip information in the order that the persons are listed in the person data section. Thus, if you choose, you may list first the trips of persons 3 and 4. Before you release the interviewee, however, make sure you have all of the persons accounted for. **REMEMBER THAT A SEPARATE TRIP REPORT MUST BE USED FOR EACH PERSON MAKING SEPARATE TRIPS.**

First Trip

The origin of the first trip in the New Orleans area is to be listed at the top of the form. Most people will begin their first trip from the Hotel where they are staying, but some people may begin from the airport, train station, bus station, etc.

The "My first trip today began at" box is used to record the origin of the first trip a person makes on the travel day. Most first trips begin at the hotel, and the only entry will be a check (√) in the Hotel Box.

From that origin, you will begin listing the trips that the respondent made. Now and then, a person's first trip will begin someplace other than the hotel. In that case, place check (√) in the other location box, and enter the address and neighborhood of that place in the place provided. When this happens find out the kind of place and enter here. For example, the person's first trip in the area may have begun at the airport coming into New Orleans from another city. Enter under kind of place Airport.

Trip Number

Use one line for each trip made. The first trip each individual makes is always number "1", and subsequent trips are numbered consecutively in the order in which they were made. The trip number appears in the first column on the travel record. The first trip origin has already been assigned a trip number of 00.

In the event that a trip is recalled out of order, record it when mentioned, and renumber the trips for that person so that they fall in chronological order.

Question: First you went to? Where did this trip end?

Write the respondent's answer to this question in the appropriate space. The best answer of all to this question is an exact street address, however many visitors will not know the addresses of places that they've been to. Included for this answer are spaces for a place name, intersection, and city. You must attempt to obtain information adequate to fill in all entries--the place name and the nearest intersecting streets and the city.

Definition: Where a trip ends is called the destination of the trip. Destination refers to the point where each person making a trip actually ends the trip, such as a person's home, an office, a store, theater, bank, school, museum, etc.

In other words, where the trip ends refers only to the ultimate destination of the specific trip being recorded. (Note; the destination of trip 1 is usually the origin for trip 2 and the destination for trip 2 is usually the origin for trip 3, etc. When this is not the case, make a comment on the questionnaire explaining the situation).

Saving Time: For trips ending at the sample hotel, the word "Hotel" may be entered to save time.

Pinpoint Exact Blocks: For any other location within the survey area, you must be more specific. In general, an acceptable description of a destination which is inside the survey area will be one which will permit coders to pin it down to the block, an address, a corner or an intersection, or a place name. To help in the coding process, write down the city of that trip destination.

You will have a tourist map of the city to help you and the respondent locate trip destinations. The respondent may remember driving down Canal St. to the aquarium, but doesn't know the cross street. Find the aquarium on the map and put the names of the intersecting streets, with N.O. as the city. The full correct entry will look like this:

Aquarium
Canal and Wells
N.O.

Trips Outside Study Area: For destinations of trips made by automobile to places outside the New Orleans metropolitan area, the name of the city or town is sufficient.

Acceptable Information: Therefore, the acceptable description will include one of the following, depending on the location information obtainable from the respondent. Strive to obtain the house or building number (address), the street name, or the nearest intersecting streets. Also write down the city in which that address

falls. If need be use your map with the respondent to determine where the trip ended.

Vague Answers: If vague answers are given, try by careful questioning to get the respondent to reconstruct the trip. Don't be satisfied with a response until you are certain that you have pinned it down as closely as you possibly can.

If the exact street number is not known, try to determine the name of the nearest street, then try to establish the name of the nearest cross street. If the destination is a well-known place, this will be acceptable, providing you distinguish it from other places having the same or a similar name and you also give the neighborhood that place is located in.

Example: Jackson Square, French Quarter
Rivergate Exhibition Facility

Terminals/Intercity Travel: A person intending to leave the survey area by airplane or bus may be taken to the station by an automobile, train, bus, or taxi. In these cases, the first trip should be considered as ending at the station, and the location of the station should be entered as the destination. The second trip would be from the station to his/her destination outside the survey area. The trip for a person arriving by airplane or bus from outside of the survey area would be recorded in a similar manner. In this case the external place outside the study area would be listed as Trip 00 and the station would be listed in Trip 01.

Survey Boundaries: For persons who left the survey area by automobile, likewise record the ultimate destination, such as Austin, Texas. The boundary of the survey area will be supplied to you on a map. If you are in doubt about whether or not a given point is inside or outside the survey area, obtain full information as if it were inside the area, so that a decision can be made at a later time.

Street Names: Record the full name of the street or avenue to distinguish it from any other with a similar name. Be certain to include such designations as "west" or "east" or "north or "south" when it is essential part of the address or street name.

Chain Establishments: Care should be taken to give the locations of prominent places which would be confused with other. For instance, there may be a number of McDonald's, etc., within the study area. Do not assume that it is the nearest one, or that the coders will know which one if referred to. Ask the respondent for its location and record it.

Question: What was the purpose of the trip?

The possible trip purpose codes are listed in this column. Circle the number which applies in the coding box for trip purpose. For example, a work trip would be coded as a "2", a meal trip as "5", and so on. If you are unable to fit a given situation to the code, or you are in doubt about a decision you have made, indicate the item with an explanatory note on the form.
To review, the trip purposes are:

1. Return to Hotel/Motel
2. Work
3. Shopping
5. Social/Recreation/Education
5. Personal Business
6. Eat a Meal
7. Other

Question: What time did the trip begin? At what time did the trip end?
Write the respondent's answer to this question in the appropriate space in column D. Enter times to the nearest minute, if possible, and be sure to circle the available designation (AM, or PM) appropriate for the time entered (AM morning, PM afternoon and evening). Noon is 12:00 PM and midnight is 12:00 AM.

Be alert for inconsistent responses, such as an hour trip in one direction and a 10 minute trip in the other direction when the same distance apparently was traveled in both directions. Trips beginning between 4:00 AM of the Travel Date and 4:00 AM of the following day are to be included in this survey.

Remember the times are trip leaving and arrival times, not the <u>destination</u> arrival and leaving time.

Question: By what means did you travel?
This is the Mode of Travel. There are eight possible responses, including "Other".

Question: **If the person was the driver of the vehicle, ask: "How many total persons were in the vehicle including the driver?"**
Enter the total number of persons in the vehicle only if the mode of travel was "Auto driver" or "Motorcycle driver".

If the person answered auto passenger, ask if one member of the part drove the vehicle. This is a yes or no question.

Question: **Were all travel party members on the same trip?"**
If all the travel party members were on the same trips for the entire travel period, one travel diary may be used.

Last Question: What was the combined income from all sources for all members of your household in 1992?

DO NOT ASK THIS QUESTIONS UNTIL THE END OF THE INTERVIEW !!!!

Please indicate the number of the income range within which your total family income falls. Hand the respondent the income range card for them to review. Read ranges and numbers if necessary.

Note the multiple-choice range of answers in the box to the right of the question on the Visitor Data sheet. Circle the appropriate number in the box to the right of the question. Write in a "0" for a refusal.

It is not mandatory that the above question be answered. If the respondent declines to answer, indicate by entering "0". Family income is defined as the approximate gross (total earnings before taxes) income for the calendar year 1992.

4. Trip Summary

This section will be completed by an editor from the trip data you collect when all of the interview information is complete and the Trip Reports are entirely filled out with all errors and omissions corrected. Do not fill this out until the Trip Reports are completed.

Total person trips reported by this party

Enter the total number of trips reported at this address on the line to the right of the question.

Persons, sixteen years of age or older, making trips

Enter the number of persons, sixteen years of age or older, making trips on the line to the right of this question.

Persons, sixteen years of age or older, not making trips

Enter the number of persons, sixteen years of age or older, not making trips on the line to the right of the question.

Complete or incomplete interview code

Do not make any entries here; for office use only.

5. Administrative

Several administrative items will ensure that the survey form can be completed in a timely and accurate manner. Enter the items listed below in the space provided on the form.

Completed interview submitted

Fill in the date and time when a completed interview has been obtained, plus your initials. Also, sign the statement included which reads:

"I certify that all information on this form is correct and true"

Do not sign this statement until you are absolutely sure that the forms are completely and accurately filled out.

Interview submitted incomplete

If after your best efforts to complete an interview, you are forced to submit an incomplete interview, enter a full explanation of your reasons here. This will aid in analyzing survey results. If some items of information were not obtained, explain here. Enter any comments or explanations that might be helpful to your supervisor and the Visitor Study in reviewing the Household Questionnaires and Trip Reports turned in as complete. Following the comments, be sure to include the date and your initials, as this will allow for follow-up contact at a later date.

First Edit & Final Edit

These spaces are for the use of office editors and coders. Do not make entries in these two items.

REVIEW

You are responsible for the completeness and correctness of all Interview Forms which you complete. Be sure to check over the filled-out form while you are still at the sample hotel and the respondent is available. This often can eliminate mistakes or fill in missing information. Any omission or error should, of course, be immediately corrected.

Appendix J

A Recent Manual Geocoding Instruction Book

TUCSON GEOCODING MANUAL

Prepared for the
Pima Association of Governments
Tucson Travel Survey

Prepared by:
NuStats, Inc.
June 1993

OUTLINE OF MANUAL

I. INTRODUCTION TO GEOCODING

II. TOOLS USED FOR GEOCODING
- A. TAZ MAPS
- B. CITY MAPS
- C. DIRECTORY ASSISTANCE
- D. COMMON DESTINATION ADDRESS LISTINGS
- E. TELEPHONE DIRECTORY
- F. ADDITIONAL RESOURCES

III. GEOCODING PROCESS
- A. PRINTOUT TYPES AND VARIABLES CONTAINED IN EACH
- B. ACTUAL GEOCODING PROCESS FOR EACH ADDRESS TYPE:
  1. EXACT ADDRESS
  2. INTERSECTING STREETS
  3. LANDMARKS
- C. OUT OF AREA CODES
- D. INTERSECTING TAZ's

IV. CONCLUSION

1.
INTRODUCTION TO GEOCODING

WHAT IS IT AND WHY IS IT DONE?

Geographic coding (geocoding) is part of the final stages of the data collection and data processing efforts. Once all Tucson household travel surveys have been collected and entered, each address must be assigned a numeric code. These number codes are used to make a comprehensive computer model of Eastern Pima County, showing current traffic patterns as well as projected future traffic congestion.

The geocoding will be performed using Traffic Analysis Zone maps (TAZs) of the study area provided by the client. These maps are delineated according to physical boundaries and will include some of the outlying Tucson areas. As much as possible, we will use these maps as our primary method of coding the trips, but there will also be other methods when a location is remote or difficult to identify. It is expected that the client will assist in obtaining and providing us with a complete and up-to-date set of geocoding materials.

The geocoding process is crucial in understanding how the local population is currently using existing roads and to help identify where new roadway improvements or what public transit modes may be necessary in the future. The credibility of NuStats' research data depends upon the most accurate data that we can produce. The geocoding which we do for this or any other transportation study is extremely important, so please be as accurate as possible. There are a large number of addresses to be coded, therefore, it is paramount to be familiar with the geocoding procedures and techniques described in this guide.

2.
TOOLS USED FOR GEOCODING

1. TAZ Maps-
   These traffic analysis zone maps are basically city maps with street boundaries as units of analysis.
2. City maps-
   When using the city map of Tucson, please become familiar with the legend first. Becoming acquainted with identified points of interest, local schools, the city and county boundaries, and local bodies of water will make the coding process more efficient and easier.

These first two maps should be sufficient in order to code a particular trip. Any steps necessary beyond this point should only be taken if it is requested by your supervisor. If an address requires more attention, set it aside for your supervisor or the coder working on the ones needing special attention or additional detailed research.

3. Directory assistance-
   In the event that we need additional information to determine a geocode, it may be necessary to dial the operator for assistance. You may dial 1-602- 555-1212; be aware, there is a charge when the operator assists you; use this as sparingly as possible.

4. Common destination address list-
   On a separate sheet of paper, you should record recurring addresses and their respective TAZ codes during the first few days of geocoding (for example: Tucson Mall, public schools, The University of Arizona). Since we are dealing with three different listings of address types, one updated list can be applied to all lists or indices as an efficient method of geocoding a lot of the repeated destinations.

5. Telephone Directory, the White Pages-
   From time to time, we may resort to this directory so we can easily find a specific address or a phone number so we can call the place and actually ask them their address. In the Blue Pages, state and national offices of government will be listed, and in the White Pages, businesses are easily researched.

6. Additional resources-

Another option at our disposal is the local U.S. Post Office. The number for general & ZIP code information is 620-5157. While most postal employees will be willing to help out someone calling them with a quick question, not all postal en:ployees always will.

A small map and grid from the Tucson White & Yellow Pages will also be provided to you for easy street reference, make sure you have a copy.

3.
THE GEOCODING PROCESS

A. THE DIFFERENT TYPES OF ADDRESS LISTINGS

The process of geocoding begins after the data processing department has keypunched all travel data. Three different lists of alphabetically listed street names will be provided by data processing:

1.)*Exact address Listing*:
-includes the record number (the kerchunked unique number), the person number, the trip number, the name of place, street number, the street name, city, zip code.

2.) *Intersecting streets listing:*
-includes record number, the person number, the trip number, the name of place, first street name, the second street name, city, and a zipcode if available.

3.) *Establishment location/landmark listing::*
-includes the record number , the person number, the trip number, the place name of establishment, street name (if available) or significant physical landmarks (example- McDonalds near a specific Post Office) the city name, and a zip code if available.

Explanation of lists

The record numbers are the "kerchunk" numbers assigned to the particular household travel diary. The person numbers are the numbers for each member of the household. The trip number is for each trip made in order of travel. The name of place is where they went on the trip, and the address is simply the address of that particular place.

Depending upon which one of the three types of print - outs you are working on, the address information will be the one variable which you must be very careful with coding correctly. In general, an acceptable description of a destination which is in the survey area will be one which will permit coders to pin it down to the exact block, address, corner, intersection, or place. Specificity will pay off when coding more difficult locations (see Intersecting TAZ's).

AS YOU BEGIN, IMPORTANT ITEMS TO BE AWARE OF

Once a list is handed to you, then you are ready to begin. The actual coding will be done on each list itself with a red colored pencil. As you look on the sheets of the computer print out, note that the addresses will be alphabetically arranged; it will be your responsibility to notice all spelling variations of street names and to make note of common spelling errors which would affect geocoding. Do not waste your time by rewriting addresses, the only information which data processing will be looking at are the codes themselves, but please do record these errors for our own use on the common address listings sheet.

It is also possible that you may come across a house number which doesn't exist or even a street name which is not located on the maps. It will then be necessary to utilize some of the other tools available (see Tools used for geocoding). You should locate the address types as quickly as possible, therefore, if you spend over 2-3 minutes searching and you can't geocode it or no available information is there, please set it aside for your supervisor. Problem addresses will be worked on and given additional attention after the bulk of the coding is completed.

For the purposes of our work, it is not necessary to scan the TAZ maps to locate where the street physically lies (for example- with intersecting streets, once located, simply identify that they do indeed intersect and record the geographic code. Do not waste time looking for every single street, especially if it is listed on the map index itself.

B. ACTUAL GEOCODING PROCESS FOR EACH ADDRESS TYPE:

1. *Exact Address Listing:*

These should be the easiest to code.

Step One: Locate address on the TAZ map.

Step Two: Apply corresponding geocode to the right of that address.

Step Three: Indicate how many addresses use this same code by bracketing all coded addresses.

Example:

1. 1801 S. Main St.- *127*
2. 1801 S. Main St.- "
3. 1801 S. Main St.- "
4. 1809 S. Main St.- *133*

Step Four: Repeat process for next address.

2) *Intersecting Streets Listing:*

These may take you a little longer due to possible additional research.

Step One: Locate first street name on the TAZ map. You may wish to jot down the code if you like.

Step Two: Locate second street name on the TAZ map.

Step Three: Using a red pencil, a finger, or other pointer, look to make sure that these streets actually do intersect each other.

Step Four: If the streets intersect at this point, assign the corresponding geocode. Be sure you have no doubts at this point. *

Step Five: Indicate how many intersecting streets have this same code by bracketing all coded intersecting streets.

Step Six: Repeat process for the next intersecting streets.

PROBLEMS?

* If you have doubts about the streets actually intersecting from the intersecting streets list, please look at section two of this manual (Tools).

* There will be intersections listed which cannot possibly intersect each other; it is then your responsibility to use the tools available to research the exact location of the proper place name to geocode.

* In the event that the intersecting streets indicate a major intersection or other large area, you should then look at the land use of the area to help geocode.

Using the place name included on the listing, you will then be able to make an informed decision of which geocode should be applied. In the case where the land use remains unclear or the map doesn't clearly indicate what is out there, you should then ask your supervisor which code to apply.

*Since these addresses will be listed alphabetically by the order in which it was written down, be sure to check if the same streets appear in another location and code these also:

Example: Maple St. & Oracle Rd.

or

Oracle Rd. & Maple St.

3. *Landmark Listing:*

These may take the greatest amount of thought and time, to research. There are many different methods to do this but here is one way.

Step One: Using the place name to locate the missing street names may be one quick way to geocode the area.

Step Two: Consult the white and yellow pages to see if there is an actual address-- the respondent may simply not have known that a "landmark" has a specific address, therefore, you may be able to locate it here.

Step Three: If you then locate an actual address, please list it on the common address listed form. Do Not correct the listing itself, simply write the geocode to the right of the landmark.

Step Four: Indicate how many landmarks use this code by bracketing them.

Step Six: If you cannot locate an actual address in the telephone book, you may wish to give the phone number a call * (if provided, of course) –you can then record the information gained on the common address list form: exact address, intersecting streets, zip code, etc...

*When calling a location, do not waste time by formally introducing yourself as in our introduction to interviewing, they may refuse to talk to you. You should simply ask where they are located - especially if it's a place like a restaurant, grocery store, gas station. They will just think you're a customer calling that is going to come by, so they will give you the address or location without hesitation.

Step Seven: If still no luck, then give the local U.S. Post Office a call, they may be able to help. (Look at other geocode research techniques in tools section)

Step Eight: If after a few minutes you are not successful in finding a geocode, please document all tools used and what the problem is as thoroughly as possible and inform your supervisor. As stated previously, after the bulk of geocoding is completed, those needing extensive research will be worked on.

Step Nine: Repeat process for next landmark listed.

C. OUT OF AREA CODES

A standard code will be given for all out of area locations—0000 (check the list of East Pima County Cities in the study area). All other codes will be from the TAZ maps. Preliminary geocoding will determine the street direction of even and odd numbered addresses, which can change on a city by city basis, to find out on which side of a street different codes will fall.

Trips that cannot be geocoded will be identified with a code of 0000: fewer than 2 or 3% of the trips will be in this category. External trips (originating or terminating outside the study area) will be assigned external codes.

D. INTERSECTING TAZ's

As listed in the process of coding intersecting streets, intersecting/overlapping TAZ codes require special attention and additional thought. Using the tools of the manual, you should be able to narrow down the possibilities into two or three geocodes; once again, use your judgment to determine the most appropriate code to assign or ask your supervisor.

4.
CONCLUSION

Keep in mind the purpose of geocoding is to assign the address or location a geographic code. You will look at an address or location on your list, then look on the map to figure out which code it falls within, then assign it the correct code by writing it down on the list. You should accomplish this all within 2-3 minutes. The entire geographic coding process has been outlined in this manual to facilitate efficient and effective coding and to give you a general overview of the procedures. You should read through this manual and know these techniques and available resources before beginning this task.

Appendix K

Suggested Reading for Planning a Travel Survey

Suggested Reading for Planning a Travel Survey

We strongly recommend that survey teams review the following textbooks that focus on travel surveys, textbooks that discuss survey research methods, and research papers that address travel and survey research issues.

Travel Survey Textbooks

1. U.S. Department of Transportation, Federal Highway Administration, *Urban Origin-Destination Surveys*, Washington, D.C., 1973 (reprinted 1975).

2. A.J. Richardson, Elizabeth Ampt and Arnim Meyburg. *Survey Methods for Transport Planning*, Eucalyptus Press, Melbourne, 1995.

3. E.S. Ampt, A.J. Richardson, and W. Brog. *New Survey Methods in Transport*, VNV Science Press: Utrecht, The Netherlands, 1985.

General Surveying Textbooks

1. Floyd J. Fowler, *Survey Research Methods*, SAGE Publications, 1988.

2. Chales Backstrom and Gerald Hursh-Cesar, *Survey Research*, 2nd edition. John Wiley & Sons (1981).

3. Dan Dillman, *Mail and Telephone Surveys: The Total Design Method*, John Wiley & Sons, New York, 1978.

4. Paul E. Green, Donald S. Tull, and Gerald Albaum, *Research for Marketing Decisions*, 5th edition, Prentice Hall (Princeton NJ), 1988.

5. David A. Aaker and George S. Day, *Marketing Research*, 4th edition, John Wiley & Sons, New York, 1990.

6. Leslie Kish, *Survey Sampling*, New York: John Wiley & Sons, 1965.

7. William Cochran, *Sampling Techniques*, 2nd edition, New York: John Wiley & Sons, 1966.

8. G.A. Churchill. *Marketing Research: Methodological Foundations,* The Dryden Press, 1984.

Research Papers and Journal Articles

We also recommend a comprehensive literature search of transportation planning journals and marketing research journals. Some of the journals that should be reviewed are:

1. Transportation Research Record;
2. Transportation;
3. Journal of Marketing Research;
4. Journal of the Market Research Society; and
5. Public Opinion Quarterly.

In addition, we recommend that survey teams obtain copies of the resource papers for the recent Household Travel Surveys: New Concepts and Research Needs Conference and KW Axhausen's *Travel Diaries: An Annotated Catalogue.*

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Recycled
Recyclable