RT-HIS

Regional Travel - Household Interview Survey

METHODS AND IMPLEMENTATION

Prepared for the New York Metropolitan Transportation Council (NYMTC) and the North Jersey Transportation Planning Authority (NJTPA)

prepared by:
NuStats International
in association with
Parsons Brinckerhoff Quade & Douglas, Inc.

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Table of Contents

List of Tables

INTRODUCTION

This report documents the design, implementation and results of the 1997/98 Household Interview Survey (HIS), conducted February 1997 through May 1998. The survey is an essential element in the Transportation Models and Data Initiative Project. The initiative will result in travel forecasting models, computer programs, databases, and users' guides for use in the regional analysis of transportation and its interaction with land use development and air quality issues in the New York / New Jersey metropolitan areas. The study was conducted under the auspices of the New York Metropolitan Transportation Council (NYMTC) and the North Jersey Transportation Planning Authority (NJTPA).

The 1997/98 HIS survey, like all recent household travel surveys, relied on the willingness of area residents to complete diary records of their daily travel over a 24-hour period. Recruitment of households was conducted through a "recruitment interview" in which respondents were informed of the survey, its purpose and the respondent's obligation to complete diaries. Data on households and household members were also collected during the recruitment interview.

Participating households were assigned specific "travel days" to record their travel, which typically occurred 10 days after recruitment and during which household members were asked to record travel information in their diaries for a specified 24 hour period. Immediately after the assigned date, households were contacted to retrieve the diary information. In total, 14,441 households were recruited to participate in the study. Of these, 11,264 households completed travel diaries, and information was retrieved from all household members regardless of age.

The survey used a scientifically formulated sample design, appropriate instruments for data collection, a package of written materials to communicate with survey respondents, a toll-free survey hotline, and data collection, processing and reporting procedures that comported to standards of the Council of American Survey Research Organizations (CASRO).

The purpose of this report is to detail the methods used to sample and survey the study households. It is one in a series of reports designed to disseminate the project results. Other reports include:

- **RT-HIS General Final Report** - comprehensive document that recaps the essential information provided in the above noted reports and focuses on measures of travel activity patterns estimated for the geographic regions included in the study.
- **RT-HIS Data Users Manual** – designed to provide data users with detailed information to facilitate proper use of the data.
- **RT–HIS Compendium of Results** – tabular presentation of results by geographic regions of the study area.
- **RT-HIS Presentation Material** – brief, pictorial presentation of the data with highlights of data collection and a focus on the resultant data set and its capabilities.
- **RT-HIS - Comparative Analysis: Weekday and Weekend Travel** – special comparative analysis of weekday and weekend travel in the region, using the small sample of households in New Jersey who recorded weekend travel, supplemented by the 1995 National Personal Transportation Survey (NPTS) data obtained by NYMTC through the supplemental sample add-on program.
- **Special Topics: Analysis Plans for Future RT-HIS Research and Reporting** – report is the development of outlines and a brief analysis plan for a series of special topic reports that may be referenced in doing special research with this data set in the future.

SAMPLE METHODS

The purpose of the HIS is to provide information suitable for gaining an in-depth understanding of the activity and travel behavior of households and individuals within households. The purpose of the sampling design is to collect data from a sufficient number of households to meet modeling data needs.

Sample design and selection were accomplished according to a plan developed by Cambridge Systematics, which employed 17 "mode leadership densities." This term comes from the desire of the sampling plan to capture the differences in mode utilization within the various residential density groups within the counties of study. In other words:

- **Mode leadership:** the differences in mode utilization
- **Densities:** within the various residential density groups within the counties of study.

The sample strata were comprised of mode leadership density categories within 22 of the 28 counties across the study area. For the remaining 6 counties (which were added to the study after the sampling plan was completed), the sample strata were at the county level, therefore taking into account neither mode leadership nor residential densities. A summary of the sampling design and generation techniques is contained in this document, as well as an analysis of final sample composition, calculation of weights, identification of sample bias, and response rates.

Design

The sampling plan used in the HIS study included the following characteristics:

- Accurate travel and activity information needed from all members of sampled households;
- Travel data reflective of both weekday and weekend travel;
- Representation of a minimum number of households per county, sufficient to estimate values for several important socioeconomic and travel variables; and
- Differential rates of sampling within counties, according to mode leadership densities developed for use in the study.

The resultant data set is a rich source of information for use in the modeling effort, is expandable at the county level, and can provide estimates of general weekday travel parameters. The weekend sample, due to its small size (323 households in New Jersey only) can be used to estimate travel parameters at a regional scale only.

Minimum County Sample Goals. The household survey sampling plan is intended to provide sufficient information for mode choice model development and a "snapshot" of county level travel information for weekday travel. As such, the sample can be divided into two parts:

1. The portion of the sample required to provide sufficient observations in each cell for mode choice modeling purposes. This was the "effective sample size" needed for model estimation purposes (minimum of 8,100 households).
2. The portion required to supplement the information in part 1 so that a sufficient number of households are surveyed in each county to ensure that a representative sample capable of producing accurate data was obtained. This part of the sample consists of additional households in certain counties necessary to provide a minimum sample size for each county of 271 households. This portion also includes New Haven County, CT, which was added

after the commencement of data collection, and had a minimum sample size of 160 households (there were no mode-leadership densities required of this county).

The first "part" of the sample was the "effective sample size" for model estimation purposes. As shown in Table 1, the effective sample size for the sampling plan was 8,100 households. It should be noted that this calculation assumed that no increase in the effective sample size associated with the subsequent addition of six counties to the survey effort (Hunterdon, Mercer, Ocean, Sussex, and Warren Counties, NJ and New Haven County, CT). This was a very conservative assumption, and it was expected that the effective sample size would actually be a few hundred higher due to the contributions of the samples from these counties. (It was reasonable to assume that the new counties would receive the minimum sample size since all other counties of similar population and area type received the minimum.)

Table 1
Recommended Survey Allocation Plan: Weekday

County	Proposed Mode Leadership-Based Plan:	Additional Requirement for County-Level Estimates	Total Weekday Sample
Bronx	162	109	271
Dutchess	170	101	271
Kings	310	0	310
Nassau	413	0	413
New York	1654	0	1654
Orange	195	76	271
Putnam	19	252	271
Queens	280	0	280
Richmond	807	0	807
Rockland	206	65	271
Suffolk	434	0	434
Westchester	340	0	340
Bergen	657	0	657
Essex	432	0	432
Hudson	496	0	496
Middlesex	349	0	349
Monmouth	403	0	403
Morris	170	101	271
Passaic	147	124	271
Somerset	69	202	271
Union	143	128	271
Fairfield	244	27	271
New Haven	0	160	160
Hunterdon	0	271	271
Mercer	0	416	416
Ocean	0	271	271
Sussex	0	271	271
Warren*	0	271	271
	8104	2846	10950

Mode Leadership Density Sample Goals. In order to determine the mode leadership density sample goals, the study area was first evaluated in terms of population density, then mode choice availability. The residential densities were categorized into very high, high, moderate, and low groups. The mode leaderships were expressed in terms of available modes for the regions. When combined, the same mode could appear in several strata, based on population density. The sample distribution by mode leadership density is shown in Table 2.

Table 2
Survey Allocation Plan for Model Development

Model Sampling Cell				UNIFORM		PLAN	
Density	Mode Leadership	Group ID	Number of Households (1990 Census	Sample Size	Sampling Rate	Sample Size	Sampling Rate
Very High	Taxi	1	463,972	673	0.15%	1,479	0.32%
	Auto, Bus	2	38,549	56	0.15%	300	0.78%
	All Other	3	1,523,954	2,212	0.15%	564	0.04%
High	Subway	11	742,769	1,078	0.15%	300	0.04%
	Railroad	12	398,773	579	0.15%	300	0.08%
	Bus	13	169,242	246	0.15%	300	0.18%
	Ferry	14	134,914	196	0.15%	921	0.68%
	Walk/Bicycle	15	183,041	266	0.15%	300	0.16%
	All Other	16	347,646	505	0.15%	300	0.09%
Moderate	Railroad	21	371,427	539	0.15%	300	0.08%
	Walk/Bicycle	22	152,478	221	0.15%	611	0.40%
	Bus	23	124,527	181	0.15%	351	0.28%
	All Other	24	487,512	708	0.15%	319	0.07%
Low	Railroad	31	313,825	455	0.15%	300	0.10%
	Bus	32	271,349	394	0.15%	687	0.25%
	Walk/Bicycle	33	127,884	186	0.15%	468	0.37%
	All Other	35	558,071	810	0.15%	300	0.05%
Unallocated (to fill county quotas)				1,084		2,287	
TOTAL *			6,409,933	10,387		10,387	

** Note: Without New Haven and Mercer; added on to original regional sample.*

Six counties did not have any mode leadership density strata and were sampled solely at the county level. These included New Haven, CT and the New Jersey counties of Hunterdon, Mercer, Ocean, Sussex, and Warren. The full sample plan, including these counties, is shown in Table 3.

Table 3
Expected Number of Households by County and Mode Leadership Density

	Mode Leadership Density																	
	1	2	3	11	12	13	14	15	16	21	22	23	24	31	32	33	35	Total
New York Counties																		
Bronx	-	-	175	96	-	-	-	-	-	-	-	-	-	-	-	-	-	271
Dutchess	-	-	-	-	-	-	-	-	-	-	61	-	13	-	-	122	75	271
Kings	-	-	272	38	-	-	-	-	-	-	-	-	-	-	-	-	-	310
Nassau	-	-	-	4	163	-	-	25	30	71	54	21	8	25	1	8	3	413
New York	1479	-	70	-	-	-	-	106	-	-	-	-	-	-	-	-	-	1654
Orange	-	-	-	-	-	-	-	22	-	-	59	-	-	-	61	71	59	271
Putnam	-	-	-	-	-	-	-	-	-	-	-	-	-	86	-	-	185	271
Queens	-	-	119	161	-	-	-	-	-	-	-	-	-	-	-	-	-	280
Richmond	-	-	-	-	-	-	757	-	-	-	-	-	-	-	50	-	-	807
Rockland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	265	-	6	271
Suffolk	-	-	-	-	8	-	-	2	16	46	40	3	88	49	4	121	56	434
Westchester	-	-	-	-	92	-	-	13	-	75	89	-	-	72	-	-	-	340
New Jersey Counties																		
Bergen	-	-	-	-	2	8	164	-	82	10	9	235	15	8	77	41	7	657
Essex	-	-	-	-	9	250	-	-	37	8	34	41	16	7	27	-	5	432
Hudson	-	300	-	39	-	43	-	51	-	-	50	-	-	-	14	-	-	496
Hunterdon																		271
Mercer																		416
Middlesex	-	-	-	-	4	-	-	44	-	30	12	-	47	7	145	51	9	349
Monmouth	-	-	-	-	-	-	-	15	3	0	142	37	19	31	96	46	13	403
Morris	-	-	-	-	-	-	-	-	1	5	57	17	19	6	4	42	121	271
Ocean																		271
Passaic	-	-	-	-	-	-	-	46	76	-	20	-	68	-	-	11	50	271
Somerset	-	-	-	-	-	-	-	-	23	-	29	-	34	-	-	4	181	271
Sussex																		271
Union	-	-	-	-	41	-	-	-	74	44	-	-	86	19	8	-	-	271
Warren																		271
Connecticut Counties																		
Fairfield	-	-	-	-	-	-	-	-	50	38	-	-	37	87	14	-	45	271
New Haven																		160
Total	1,479	300	636	338	319	301	921	324	392	327	656	354	450	397	766	517	815	10,952

Generation

Determination and calculation of the required number of listed telephone numbers and unlisted telephone numbers took into account the working rate, the expected ability to locate a household within the designated county and mode leadership density or “geo-hit” rate, and the expected response rate. In addition, a 30 percent excess sample was added to provide a “safety net” for routine estimation error on all of the factors identified.

A total of 52,390 telephone numbers were generated for the study area (each county separately then combined into a master sample file). The total sample in the sample database was then randomly assigned to sample sub-groups for sample management purposes. Each sample sub- group was fielded independently and fully exhausted prior to a new one being opened and assigned to interviewers for data collection.

Final Sample Composition

The definition of a completed household was one in which all household members (regardless of age) provided activity and travel information for the entire 24-hour diary period. A total of 11,264 households met this definition and comprises the final data set. Of these, 10,971 reflect weekday travel and 323 weekend travel. The distribution of completed weekday households by county and mode leadership density goals are shown in Table 4.

Table 4
Actual Number of Weekday Households by County and Mode Leadership Density

	Mode Leadership Density																	
	1	2	3	11	12	13	14	15	16	21	22	23	24	31	32	33	35	Total
New York Counties																		
Bronx	-	-	172	99	-	-	-	-	-	-	-	-	-	-	-	-	-	271
Dutchess	-	-	-	-	-	-	-	-	-	-	46	-	18	-	-	133	78	275
Kings	-	-	428	61	-	-	-	-	-	-	-	-	-	-	-	-	-	489
Nassau	-	-	-	4	160	-	-	24	29	71	37	10	8	24	1	7	9	384
New York	1166	-	270	-	-	-	-	112	-	-	-	-	-	-	-	-	-	1548
Orange	-	-	-	-	-	-	-	31	-	-	32	-	-	-	58	80	69	270
Putnam	-	-	-	-	-	-	-	-	-	-	-	-	-	76	-	-	185	261
Queens	-	-	134	142	-	-	-	-	-	-	-	-	-	-	-	-	-	276
Richmond	-	-	-	-	-	-	749	-	-	-	-	-	-	-	64	-	-	813
Rockland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	250	-	-	250
Suffolk	-	-	-	-	7	-	-	1	20	54	13	-	141	50	2	33	111	432
Westchester	-	-	-	-	114	-	-	11	-	76	48	-	-	73	-	-	-	322
New Jersey Counties																		
Bergen	-	-	-	-	2	9	137	-	95	12	10	214	23	18	70	34	19	643
Essex	-	-	-	-	-	232	-	-	52	11	30	30	23	11	22	-	7	418
Hudson	-	142	-	188	-	56	-	63	-	-	27	-	-	-	13	-	-	489
Hunterdon																		276
Mercer																		409
Middlesex	-	-	-	-	8	-	-	41	-	36	9	-	50	13	152	49	18	376
Monmouth	-	-	-	-	-	-	-	15	5	-	103	26	43	59	89	43	50	433
Morris	-	-	-	-	-	-	-	-	-	3	45	19	28	5	2	41	145	288
Ocean																		269
Passaic	-	-	-	-	-	-	-	45	72	-	20	-	67	-	-	10	61	275
Somerset	-	-	-	-	-	-	-	-	17	-	31	-	44	-	-	5	169	266
Sussex																		277
Union	-	-	-	-	36	-	-	-	76	43	-	-	80	18	7	-	-	260
Warren																		271
Connecticut Counties																		
Fairfield	-	-	-	-	-	-	-	-	44	33	-	-	39	103	11	-	40	272
New Haven																		160
Total	1166	142	1004	494	327	297	886	343	410	339	451	299	564	450	741	435	961	10971

Base: All households reporting weekday travel data.

The sampling objective was to obtain the total number of households by county specified, and by mode leadership density specified, but not for each mode leadership density within a specified county. In other words, the sampling goals were based on the table marginals, not the interior cells. The extent to which these marginal goals were met is shown in Table 5. Specifically, the county goals were met or came within 7% of the goal. Kings County was completed at 157% of its original goal, due to sample management error.

In terms of mode leadership densities, sample management was a much more difficult task. The mode leadership densities were assigned based on the census tract corresponding to the household address. Once an address was known, the household could be confidently pre-assigned a mode leadership density prior to fielding so that proper sample management techniques could be applied. As sample was released and households contacted, however, the geocoding of the home addresses resulted in movement of households among the mode

leadership densities within each county. Reasons for the movement included households that had moved and an old address was listed in the database, households that had moved and taken their phone number with them, and telephone exchanges that overlapped census tracts (which were the primary unit for defining mode leadership density in most cases). This, in essence, meant that sample management of the mode leadership density strata became an "after the fact" situation, which is much harder to control for in a data collection environment, particularly a multi-stage survey such as the HIS. As a result, the actual mode leadership density distribution did not mirror the goals as nicely as the county distribution for about half of the mode leadership density categories. The most extreme difference occurred in mode leadership density 35, which was the "low density - other" category for each county.

One exception to this movement is mode leadership density 2 (very high-density auto or bus), which was only in Hudson County. In this stratum, the goal was an extreme oversampling of the population. As the survey fielding progressed, it became apparent that the oversampled goal could not be met. Therefore, that goal was reduced to 142, with the remainder re-allocated to the other mode leadership densities in Hudson County. The reduction in this goal reflected a sampling goal more proportionate to the actual distribution of population in Hudson County and did not adversely affect any modeling plans.

Table 5
Sample County Goals vs. Achieved

County	Goal	Actual	%
NY Counties			
Bronx	271	271	100%
Dutchess	271	275	101%
Kings	310	489	158%
Nassau	413	384	93%
New York	1654	1548	94%
Orange	271	270	99%
Putnam	271	261	96%
Queens	280	276	99%
Richmond	807	813	101%
Rockland	271	250	92%
Suffolk	434	432	99%
Westchester	340	322	95%
NJ Counties			
Bergen	657	643	98%
Essex	432	418	97%
Hudson	496	489	99%
Hunterdon	271	276	102%
Mercer	416	409	98%
Middlesex	349	376	108%
Monmouth	403	433	107%
Morris	271	288	106%
Ocean	271	269	99%
Passaic	271	275	101%
Somerset	271	266	98%
Sussex	271	277	102%
Union	271	260	96%
Warren	271	271	100%
CT Counties			
Fairfield	271	270	100%
New Haven	160	160	100%
Total	10945	10971	100%

Table 6
Sample Mode Leadership Density Goals vs. Achieved

	Mode Leadership Density	Goal	Actual	%
1	Very High, Taxi	1479	1166	79%
2	Very High, Auto, Bus	300	142	47%
3	Very High, Other	564	1004	178%
11	High, Subway	300	494	165%
12	High, Railroad	300	327	109%
13	High, Bus	300	297	99%
14	High, Ferry	921	886	96%
15	High, Walk/Bicycle	300	343	114%
16	High, Other	300	410	137%
21	Moderate, Railroad	300	339	113%
22	Moderate, Walk/Bicycle	611	451	74%
23	Moderate, Bus	351	299	85%
24	Moderate, Other	319	564	177%
31	Low, Railroad	300	450	150%
32	Low, Bus	687	741	108%
33	Low, Walk/Bicycle	468	435	93%
35	Low, Other	300	961	320%
	Total	8,100	9,309	115%

RT-HIS Household Locations

The distribution of completed households by day of week is shown in Table 7. There is a fairly even distribution for both weekday and weekend travel. All weekend travel came from only New Jersey households. The 1995 Nationwide Personal Transportation Survey contains sufficient data on the weekend travel habits of New York residents and will be used for that portion of the weekend travel analysis.

Table 7
Travel Day Distribution

Travel Day	Frequency	Percent
Sunday	143	1.3%
Monday	2209	19.6%
Tuesday	2168	19.2%
Wednesday	2125	18.9%
Thursday	2175	19.3%
Friday	2294	20.4%
Saturday	150	1.3%
Total	100%	100%

Base: All households reporting travel data.

Weight Calculations

Weighting and validation of the data occurred in two stages. Stage 1 weights adjust the data for probability of selection, while the Stage 2 weighting balances the data demographically.

Stage 1 Weight Calculations. The Stage 1 weight is comprised of five elements that aim to adjust the weekday survey data to correct for differential rates of sampling that occurred and telephone ownership patterns.

1. **Probability of selection**. This accounted for differential probabilities of selection in the sample generation stage. Under ideal sampling conditions, assuming that the study area was relatively homogenous with respect to telephone ownership, one would only need to take into account the sample size (actual number of telephone numbers drawn and made available for contact) by county and mode leadership density and the estimated universe of households within that sample strata. The unique relationship of those two numbers for each stratum would be the probability of selection, and the inverse of them would be the weight factor that would be applied to each county / mode leadership density combination.

   The NYMTC/NJTPA RT-HIS study area, however, did not meet the assumption of homogeneity. Certain locations had very high levels of telephone ownership turnover and very different rates of working telephone numbers, while others were much more stable and had higher rates of ownership and working rates. Therefore FACTOR 1 incorporated probability of selection and took into account the heterogeneity of counties in the study region. This approach combined weighting with geographic balancing and used the actual number of completed households and the universe of households by county and mode leadership density.

The following tables illustrate the factor calculation process for county and mode leadership density strata: the number of completed weekday households (Table 8), the number of households in the universe (Table 9), and the weighting factor, which accounts for probability of selection (Table 10).

Specifically, Table 8 is a replica of Table 3 displayed earlier and reproduced here to help understand the calculation of this factor. Table 8 displays the actual number of households that completed the study, distributed by county and mode leadership density strata.

Table 9 contains the populations for each county and mode leadership density strata or the survey universe.

Table 10 contains the weighting factors that adjust for probability of selection. To explain how these factors were developed, the process is examined for New York County, mode leadership density 1.

a. A total of 1166 households completed the RT-HIS in New York County, mode leadership density 1, as displayed in Table 7.
b. According to the 1996 Urbanomics county total allocated by mode leadership density, there were 458,749 households in New York County, mode leadership density 1, as displayed in Table 8.
c. Each cell is Table 7 was converted to a percent of total. Although not shown, for the New York County, mode leadership density 1 cell, 1166 was divided by 10,971 (table total) was 0.1063 or 10.63% of the total.
d. Similarly, each cell in Table 8 was converted to percent of total. Although not shown, for the New York County, mode leadership density 1, 458,749 divided by 7,180,538 was 0.0639 or 6.39% of the total.
e. With a uniform sample, the percent of totals calculated for the sample and the universe would be the same, setting the probability of selection to 1. While the RT-HIS households represented 10.63% of the total sample, they accounted for 6.39% of the total population. To create the factor for New York County, mode leadership density 1, the completed HIS households were brought into line with the population of that same area. Specifically, 0.0639 was divided by 0.1063 to create the weight factor of 0.601.
f. This process was repeated for all cells in both Tables 7 and 8.
g. Since the weights were applied by county and mode leadership density, weights were not calculated for the totals.

Table 8
Actual Number of Households by County and Mode Leadership Density (Weekday only)

	Mode Leadership Density																	
	1	2	3	11	12	13	14	15	16	21	22	23	24	31	32	33	35	Total
New York Counties																		
Bronx	-	-	172	99	-	-	-	-	-	-	-	-	-	-	-	-	-	271
Dutchess	-	-	-	-	-	-	-	-	-	-	46	-	18	-	-	133	78	275
Kings	-	-	428	61	-	-	-	-	-	-	-	-	-	-	-	-	-	489
Nassau	-	-	-	4	160	-	-	24	29	71	37	10	8	24	1	7	9	384
New York	1166	-	270	-	-	-	-	112	-	-	-	-	-	-	-	-	-	1548
Orange	-	-	-	-	-	-	-	31	-	-	32	-	-	-	58	80	69	270
Putnam	-	-	-	-	-	-	-	-	-	-	-	-	-	76	-	-	185	261
Queens	-	-	134	142	-	-	-	-	-	-	-	-	-	-	-	-	-	276
Richmond	-	-	-	-	-	-	749	-	-	-	-	-	-	-	64	-	-	813
Rockland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	250	-	-	250
Suffolk	-	-	-	-	7	-	-	1	20	54	13	-	141	50	2	33	111	432
Westchester	-	-	-	-	114	-	-	11	-	76	48	-	-	73	-	-	-	322
New Jersey Counties																		
Bergen	-	-	-	-	2	9	137	-	95	12	10	214	23	18	70	34	19	643
Essex	-	-	-	-	-	232	-	-	52	11	30	30	23	11	22	-	7	418
Hudson	-	142	-	188	-	56	-	63	-	-	27	-	-	-	13	-	-	489
Hunterdon																		276
Mercer																		409
Middlesex	-	-	-	-	8	-	-	41	-	36	9	-	50	13	152	49	18	376
Monmouth	-	-	-	-	-	-	-	15	5	-	103	26	43	59	89	43	50	433
Morris	-	-	-	-	-	-	-	-	-	3	45	19	28	5	2	41	145	288
Ocean																		269
Passaic	-	-	-	-	-	-	-	45	72	-	20	-	67	-	-	10	61	275
Somerset	-	-	-	-	-	-	-	-	17	-	31	-	44	-	-	5	169	266
Sussex																		277
Union	-	-	-	-	36	-	-	-	76	43	-	-	80	18	7	-	-	260
Warren																		271
Connecticut Counties																		
Fairfield	-	-	-	-	-	-	-	-	44	33	-	-	39	103	11	-	40	270
New Haven																		160
Total	1166	142	1004	494	327	297	886	343	410	339	451	299	564	450	741	435	961	10971

Base: All households reporting weekday travel data.

Table 9
Households in Study Area Universe

County		1	2	3	11	12	13	14	15	16	21	22	23	24	31	32	33	35	NoMLD	Total:
	New York	458749	-	185947	-	-	-	-	63661	-	-	-	-	-	-	-	-	-		708357
	Queens	-	-	321505	396068	-	-	-	-	-	-	-	-	-	-	-	-	-		717573
	Bronx	-	-	266692	139882	-	-	-	-	-	-	-	-	-	-	-	-	-		406574
	Kings	-	-	717596	90954	-	-	-	-	-	-	-	-	-	-	-	-	-		808550
	Richmond	-	-	-	-	-	-	113988	-	-	-	-	-	-	-	20167	-	-		134155
	Nassau	-	-	-	8813	217637	-	-	15122	35341	88216	13632	7596	12446	25825	272	2299	5818		433016
	Suffolk	-	-	-	-	11755	-		1068	19668	60204	10439	1103	141209	54120	1574	34705	108693		444538
	Westchester	-	-	-	-	123941	-	-	7723	-	93800	22433	-	-	75653	-	-	-		323551
	Rockland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	84312	-	4574		88886
	Putnam	-	-	-	-	-	-	-	-	-	-	-	-	-	9097	-	-	20595		29692
	Orange	-	-	-	-	-	-	-	9331	-	-	12768	-	-	-	19202	16769	47077		105147
	Dutchess	-	-	-	-	-	-	-	-	-	-	12415	-	7545	-	-	26695	46995		93650
	Fairfield	-	-	-	-	-	-	-	-	53274	42703	-	-	50772	84574	5524	-	73679		310526
	Bergen	-	-	-	-	2938	4356	24446	-	96312	12424	2402	84921	23716	8030	30818	11392	12665		314420
	Passaic	-	-	-	-	-	-	-	19190	46851	-	4341	-	47730	-	-	2582	38345		159039
	Hudson	-	37697	-	95264	-	23493	-	30203	-	-	12195	-	-	-	5273	-	-		204124
	Essex	-	-	-	-	10968	133488	-	-	40181	9800	7967	13751	23186	6544	10156	-	7977		264017
	Union	-	-	-	-	27635	-	-	-	46605	28432	-	-	62446	11378	2378	-	-		178874
	Morris	-	-	-	-	-	-	-	-	514	3338	13061	5293	15659	3851	1338	10344	107013		160411
	Somerset	-	-	-	-	-	-	-	-	8300	-	5140	-	13210	-	-	787	72448		99885
	Middlesex	-	-	-	-	6034	-	-	28107	-	38328	3068	-	74403	8036	59929	14653	16825		249383
	Monmouth	-	-	-	-	-	-	-	10085	4079	319	38120	14033	30539	34784	40925	13636	25890		212410
	Ocean																		187902	187902
	Hunterdon																		42292	42292
	Warren																		36338	36338
	Sussex																		48786	48786
	New Haven																		309659	309659
	Mercer																		108783	108783

Base: 1996 Households / Urbanomics County Total (allocated by 1990 MLD distribution).

Table 10
Weighting Factor Adjusting for Probability of Selection

County		1	2	3	11	12	13	14	15	16	21	22	23	24	31	32	33	35	No
	New York	0.601	-	1.052	-	-	-	-	0.868	-	-	-	-	-	-	-	-	-	
	Queens	-	-	3.666	4.262	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Bronx	-	-	2.369	2.159	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Kings	-	-	2.562	2.278	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Richmond	-	-	-	-	-	-	0.233	-	-	-	-	-	-	-	0.481	-	-	
	Nassau	-	-	-	3.366	2.078	-	-	0.963	1.862	1.898	0.563	1.161	2.377	1.644	0.416	0.502	0.988	
	Suffolk	-	-	-	-	2.566	-		1.632	1.503	1.703	1.227		1.530	1.654	1.202	1.607	1.496	
	Westchester	-	-	-	-	1.661	-	-	1.073	-	1.886	0.714	-	-	1.583	-	-	-	
	Rockland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.515	-		
	Putnam	-	-	-	-	-	-	-	-	-	-	-	-	-	0.183	-	-	0.170	
	Orange	-	-	-	-	-	-	-	0.460	-	-	0.610	-	-	-	0.506	0.320	1.042	
	Dutchess	-	-	-	-	-	-	-	-	-	-	0.412	-	0.640	-	-	0.307	0.921	
	Fairfield	-	-	-	-	-	-	-	-	1.850	1.977	-	-	1.989	1.255	0.767	-	2.814	
	Bergen	-	-	-	-	2.244	0.739	0.273	-	1.549	1.582	0.367	0.606	1.575	0.682	0.673	0.512	1.018	
	Passaic	-	-	-	-	-	-	-	0.652	0.994	-	0.332	-	1.088	-	-	0.394	0.960	
	Hudson	-	0.406	-	0.774	-	0.641	-	0.732	-	-	0.690	-	-	-	0.620	-	-	
	Essex	-	-	-	-	-	0.879	-	-	1.181	1.361	0.406	0.700	1.540	0.909	0.705	-	1.741	
	Union	-	-	-	-	1.173	-	-	-	0.937	1.010	-	-	1.193	0.966	0.519	-	-	
	Morris	-	-	-	-	-	-	-	-		1.700	0.443	0.426	0.854	1.177	1.022	0.385	1.128	
	Somerset	-	-	-	-	-	-	-	-	0.746	-	0.253	-	0.459	-	-	0.240	0.655	
	Middlesex	-	-	-	-	1.152	-	-	1.047	-	1.627	0.521	-	2.274	0.944	0.602	0.457	1.428	
	Monmouth	-	-	-	-	-	-	-	1.027	1.246		0.565	0.825	1.085	0.901	0.703	0.485	0.791	
	Ocean																		1.067
	Hunterdon																		0.234
	Warren																		0.205
	Sussex																		0.269
	New Haven																		2.957
	Mercer																		0.406

Base: All households reporting weekday travel data.

2. **Multiple phone numbers for one household**. The probability of selection calculation assumed that each household in the universe had an equal probability of selection. In other words, it assumed that each household had one phone line, and therefore, one chance of selection. As shown in Table 11, this is not always the case as 14% of the sampled households indicated they had more than one working phone line that was not dedicated solely for fax or modem use. By determining the number of lines represented (# phone lines multiplied by # households with that many lines), the 10,971 households reported having 12,624 telephone (voice) lines available for their use.

   The weighting factor to account for multiple phone numbers per household was created through a two-step process. First, the actual number of voice lines available to each household was determined by subtracting the number of fax lines from the total number of phone lines available to the household. Then, the factor was created to adjust the data to compensate for cases where more than one phone line is available. Given the fact that not all households had only one line, those with one line were actually sampled at less than one chance of selection. These households (with only one line) therefore needed a factor of slightly more than one to reflect the disparity.

Table 11
Total Number of Phone Lines per Household

Total Number of Phone Lines per Household	# Households	# Lines Represented	FACTOR2
1	9537	9537	1.0971
2	1252	2504	0.5
3	154	462	0.33
4	19	76	0.25
5*	9	45	0.2
Total	10971	12624	

*Note: 2 households had more than 5 phone lines and were considered as having 5 phone lines for this calculation.

3. **Multiple Households sharing one phone number**. The next weighting factor adjusted for multiple households sharing the same phone number. A total of 27 households reported sharing a phone number with at least one other household so the 10,971 phone numbers actually only represented 10,956 households. Factor 3 was developed to adjust this so that each household had one phone line.

Table 12
Total Number of Households per Phone Line

Total Number of Households per Voice Line	# Phone Numbers	# HHlds Sampled	FACTOR3
1	10944	10944	0.9989
2	16	8	2.0000
3*	11	3.67	3.0000
Total	10971	10955.67	

*Note: 2 households reported sharing a telephone line with more than 3 households and were treated as sharing with 3 households for this calculation.

4. **Episodic Telephone Ownership**. To account for non-telephone owning households in a telephone survey, an adjustment required using data reported by those households reporting episodic telephone ownership. A total of 75 households reported being without a telephone for 2 weeks or longer in the past year. These households represented other non-telephone households in the region where ownership is "episodic."

   Episodic phone ownership was characterized by phone service being turned on or off over a given period of time, largely due to a lack of financial resources. Service was re-activated once households were able to pay, only to be de-activated at a later date due to non-payment. This was a different type of household from the true non-telephone household, where no telephone service was established. It was also a different type of household than those without phone service for less than 2 weeks, as these represented service interruptions due to telephone company repairs or weather events rather than ability to pay.

Table 13
Episodic Telephone Ownership as reported in HIS

Length of Time Without Phone Service	Frequency	Percent
Less than 2 weeks (NON-episodic)	1059	93.4%
2 weeks but less than 1 month	36	3.2%
1 month but less than 3 months	20	1.8%
3 months but less than 6 months	7	0.6%
6 months but less than 1 year	12	1.1%
Total	1,134	100.0%

To determine the weighting factor required to adjust for episodic telephone ownership, the HIS data were compared to non-telephone ownership as reported in the Current Population Survey (CPS) conducted by the Bureau of the Census. Using the customized data access software provided on the CPS website, it was determined that 5.3% of households in New York, New Jersey, and Connecticut were non-telephone households (this included both episodic and hard core non-telephone ownership).

In reality, only about half of the CPS non-telephone households were episodic. This rate was based on a general pattern observed in anecdotal evidence collected through in-person interviews and postcard follow-up surveys conducted with non-telephone households by NuStats on other studies. There have been no papers published that can serve as a resource in this area. Based on NuStats experience, the CPS distribution was adjusted to allow for a direct comparison with HIS data. Once the adjustment was made, FACTOR4 was a straightforward calculation, as shown in Table 14.

Table 14
Episodic Telephone Ownership Factor

Is Phone Service Episodic?	HIS Survey Respondents	HIS Survey Percent	CPS Data as reported on Website	CPS Data Adjusted for Episodicity	FACTOR4
No	10896	0.993	0.9470	0.9735	0.9802
Yes	75	0.007	0.0530	0.0265	3.8764
Total	10971	1.000	1.000	1.000	

5. **Normalization of Weights**. If the Stage 1 weight were based only on Factors 1 through 4, the weighted data would represent 11,530 households rather than the 10,971 weekday households actually contained in the data set. To account for this and still maintain the relative place of each household after weighting, all households were given a FACTOR5 value of 0.9515177.

Once each case received a value for each of the five factors, the Stage 1 weight was calculated through the multiplication of the factors. The Stage 1 weight is applied in the analysis of the data through the standard weighting conventions of the statistical analysis software package used. An example of the impact of this weight is shown in Table 15, which shows the unweighted and weighted distribution of responses to the household income question.

Table 15
Household Income: Weighted and Unweighted Distributions (Stage 1 weight)

Household Income	Unweighted Distribution	Weighted Distribution
Less than $10k	4.6%	6.7%
$10k but less than $15k	4.7%	5.8%
$15k but less than $25k	8.3%	10.1%
$25k but less than $35k	10.9%	12.6%
$35k but less than $50k	18.2%	19.1%
$50k but less than $75k	25.0%	22.3%
$75k but less than $100k	13.8%	11.6%
$100k but less than $150k	6.3%	7.8%
$150k or more	2.9%	4.2%
Total	100.0%	100.0%

Stage 2 Weight Calculations. The second stage in the weighting process aimed to adjust the data for variance in the sample stemming from non-response. Non-response bias occurs when an individual selected in the sample does not participate in the survey. To determine the extent to which non-response bias played a role in the RT-HIS data set, the household demographic characteristics from the 10.971 weekday households were compared to the same demographics in the 1990 Census data for the 28 counties. Two complex, three-dimensional tables were created using the household size, household vehicle, and household income variables. Although not shown, the process used to determine probability of selection detailed above was replicated using these two tables: the counts were converted to percent of table totals then divided to calculate an overall factor.

Distributions of the three key demographic variables used in the stage 2 process are shown in Tables 16 through 18. Specifically, these tables contain the HIS data distributions as well as the 1990 Census data for the 28-counties of the study area. As indicated in these tables, non-responding households in the HIS data set are more likely than responding households to have the following characteristics:

- households with 4 or more persons,
- households with no vehicles,
- households earning less than $10,000,

Table 16
Comparison of Household Size with 1990 Census Data

Household Size	Unweighted Households	Stage 1 Households	1990 Census Data	Difference	Stage 2 Households
1 person	28.7%	30.1%	26.0%	+4.1%	25.8%
2 persons	32.9%	31.6%	28.9%	+2.7%	29.4%
3 persons	15.8%	16.0%	17.3%	-1.3%	17.4%
4+ persons	22.6%	22.3%	27.7%	-5.4%	27.4%
Total	100%	100%	100%		100%

Source: HIS weekday households and 1990 Census data.

Table 17
Comparison of Household Vehicles with 1990 Census Data

Household Vehicles	HH Vehicles unweighted	HH Vehicles Stage 1	Census Data	Difference	HH Vehicles Stage 2
no vehicles	19.5%	23.7%	32.8%	-9.1%	23.5%
1 vehicle	30.4%	32.8%	35.9%	-3.1%	31.3%
2 vehicles	34.1%	30.7%	17.7%	+13.0%	31.1%
3+ vehicles	16.0%	12.8%	13.6%	-0.8%	14.1%
Total	100%	100%	100%		

Source: HIS weekday households and 1990 Census data.

Table 18
Comparison of Household Income with 1990 Census Data

Housing Type	HH Income unweighted	HH Income Stage 1	Census Data	Difference	HH Income Stage 2
Less than $10k	4.6%	6.5%	13.6%	-7.1%	7.0%
$10k but less than $15k	4.7%	5.7%	6.2%	-0.5%	6.2%
$15k but less than $25k	8.3%	10.0%	12.8%	-2.8%	11.3%
$25k but less than $35k	11.0%	12.5%	13.0%	-0.5%	10.3%
$35k but less than $50k	18.2%	19.0%	17.0%	+2.0%	15.6%
$50k but less than $75k	24.9%	22.5%	19.1%	+3.4%	20.5%
$75k but less than $100k	13.8%	11.7%	8.9%	+2.8%	12.7%
$100k but less than $150k	6.4%	5.3%	5.9%	-0.6%	7.5%
$150k or more	8.0%	6.7%	3.5%	+3.2%	9.0%
Total		100%	100%		100%

Source: HIS weekday households reporting income and 1990 Census data.

Calculation of Response Rates

The ideal conceptual approach for examining participation, and therefore for empirically estimating the actual sample draw sizes that will produce the target numbers of usable records by county and mode leadership density stratum, focused on critical stages where attrition could occur and could therefore be prevented or minimized. These stages were:

1. Contact levels
2. Recruitment levels
3. Retrieval levels

1. **Contact Levels.** The dispositions of sample replicates are shown in Table 19. These dispositions represented the final action on each sample piece, not the total number of attempts made across all sample pieces. Some dispositions were immediately final (disconnects, non-residentials, computer / fax lines, etc.). Other dispositions were transitory (no answers, busy, etc.) and final dispositions were assigned to each sample piece when the fielding of the survey was completed.

Table 19
HIS Sample Dispositions

Dispositions	Count
Recruited Sample	14,441
Unrecruited but Eligible Sample	**28,495**
Comprised of:	
Answering Machines	4937
Busy	531
Call-back - English	3105
Call-back – other language	1023
No answer	4418
Soft Refusal	4766
Hard Refusal	9487
Partial Recruit	228
Ineligible Sample	**9,454**
Comprised of:	
Disconnected numbers	6693
Business/Government	1770
Fax	991
Total Sample Pieces	52,390

2. **Recruitment Levels**. The recruitment rate was calculated from the field disposition data in Table 19, under guidelines specified by the Advertising Research Foundation.[1] The following formula represents the recruitment rate calculation:

$$R_r = N_r / N_e$$

where, R_r = the household recruitment rate
N_r = the number of recruited households with complete demographic and person data
N_e = the number of households eligible for recruitment

A total of 14,441 households completed demographic and person data. Therefore,

$$N_r = 14{,}441$$

Since these were the final call outcomes for all sample pieces, N_e (eligible households) were calculated by subtracting the ineligible sample from the total sample.

$$N_e = N_t - N_{ne}$$

Where N_t = total sample
N_{ne} = ineligible sample
and N_{ne} = DS + CF + BG
where DS = disconnects
CF = computer / fax lines
BG = business or government offices

Therefore:

$$N_e = 52{,}390 - 9{,}454$$
$$= 42{,}936$$

Finally, the recruitment rate is:

$$R_r = N_r / N_e$$
$$= 14{,}441 / 42{,}936 = 33.6\ \%$$

3. **Retrieval Levels**. The primary causes of retrieval attrition appeared to be: (a) reversal of commitment upon realization of greater-than-expected burden; (b) large household size and internal disagreement by household members about willingness to participate; (c) extenuating circumstances that prohibit involvement (accidents, illness).

The retrieval level was calculated by dividing the total number of retrieved households (11,264) by the total number of recruited households (14,441). This calculation yielded a retrieval rate of 78.2%

To determine the overall response rate, the recruitment and retrieval rates are multiplied. As shown below, the overall response rate is 26%.

33.6% x 78.2% = 26%

[1] Advertising Research Foundation. ARF Guidelines Handbook. (New York, N.Y.: Advertising Research Foundation, 1990), pp. 106-108.

Use of Incentives

Two incentives were included in the HIS: a cash incentive and a drawing for airline tickets. Each is detailed below. In general, the use of incentives should be done only in conjunction with careful survey design that takes into account respondent burden.

Cash Incentive. The use of cash incentives was tested during the 1996/97 pilot tests (detailed in another section of this report). The incentive test involved randomly assigning households to a control (no incentives) group or a test (incentives) group, then following them through the process from advance calls and mailings to recruitment and retrieval. In all stages of the project, households received the same treatment, as the assignment process was "blind" to the interviewing staff. In addition, all procedures (except for the inclusion of cash) were identical for all households included in the test.

The first incentive tested was the impact of a cash incentive on the recruitment process. This test involved a total of 1,764 households, with 870 households randomly assigned to a control group (with no incentive) and 894 households randomly assigned to the test or incentives group. Each test group household was sent $1 in their advance notification letter, which also included a magnet and a flyer letting the household know they would also be eligible for a drawing of an airline ticket. Each control group household received only the magnet and airline ticket drawing information (no cash).

Of the 1,764 households in the incentive test, contact was made with 1,524. The overall recruitment rate for these households was 36%. In the control group (no incentive), the recruitment rate was 32% -- in other words, 32% of all households agreed to participate in the study. This compares to a 40% recruitment rate for the test group. Again the only difference between the two groups was the inclusion of cash in the test group mailing (in addition to the magnet and airline drawing information received by both groups).

Based on the recruitment effort, 552 households were recruited and proceeded to the second portion of the test: completion of the retrieval stage. Of the 552 households, 317 were in the test group and 235 in the control group. The only difference in treatment for these households was that each household member in the test group received an additional $1 attached to his/her personalized diary. Control group households did not receive this cash incentive – only the personalized diaries. The overall retrieval rate was 87%, with the test group achieving an 88% retrieval rate and the control group 86%.

The overall response rate (using the method outlined in the previous section) was 32% (36% times 87%). For the test group, the response rate was 40% times 88% or 36%. The control group had an overall response rate of 27% (32% times 86%).

In addition to the quantitative increase in response rate due to the inclusion of a cash incentive, scattered, unsolicited comments of "thanks for the buck" or "it was nice to include the dollar bill with the diaries" were relatively few and positive. No negative reactions regarding the inclusion of the cash or the perception of waste of public monies were received by or known to NuStats.

Airline Ticket Drawing. Each HIS participant was eligible for a drawing in which they could win a pair of airline tickets. Notification of the drawing was included in both the advance letter and survey material mailings. In all, three drawings were held (one for each phase of data collection). The three winners were from Staten Island, upstate New York, and New Jersey. No tracking was done to determine the impact of this drawing on participation rates.

SURVEY METHODS

The purpose of this section of the report is to review the methods used to conduct the survey. First, an overview of data collection testing is presented, then the various components of the full data collection effort are discussed. Specifically, the first formal pretest was conducted in 1995, followed by a series of "dress rehearsals" in late 1996 and early 1997. Full data collection began in February 1997 and continued through May 1998, resulting in travel information for 11,264 households in the 28-county / tri-state study area.

Data Collection Overview

1995 Pilot. Prior to full implementation of the HIS survey, Parsons Brinckerhoff (PB) contracted with the Applied Management & Planning Group to conduct the first formal pretest. The pretest was conducted from May to July 1995 in Bergen, Bronx, Nassau, New York, and Westchester counties involving 215 survey participants. The pretest addressed the following objectives:

1. Tested all survey elements to identify flaws that would need to be corrected prior to the actual survey;
2. Informed the project team of the tradeoff decisions required for the actual survey; and
3. Studied the differences in response rates, data quality, and costs in relation to varying incentives and methodological options for the survey.

Three different incentive options were pretested:

- $1 per household plus incentive pens for each member of the household;
- Incentive pens for each member of the household; and
- Incentive pens for each member of the household plus a separate memory jogger for each person – detached from the one-day activity diaries.

During the pretest, information about household characteristics and travel was collected using a 24-hour activity-focused diary and a household survey printed on a folded card. Activity and travel information was requested from all household members, regardless of age, in order to examine intra-household characteristics. The data collection instruments varied only for one pretest cell, in which the same survey instrument was used but a separate memory jogger was also included with each diary.

The pretest satisfied its objective of providing information on how the incentives, diary layout, and question phrasing affected response rates and data quality. The pretest also served to point out flaws to be corrected prior to subsequent surveying. The key conclusions and implications that emerged from the pretest finding included:

Recruitment

- The recruitment attempts to each telephone number were increased from six to nine.
- To increase response rates, interviewers should better stress the importance of each households' participation in the study during the recruitment call, and be more assertive in persuading respondents who refused to participate in the study during the retrieval call.

Diary Design and Incentives

- Higher response rates were achieved when the dollar bill was enclosed and higher trip rates were associated with a dollar plus pens.
- The loose memory jogger did not yield significantly higher response rates or significantly better activity data.
- The first boarding location for all transit trips should be highlighted, to ensure that all transit users provide this information.

Data Elements

- Certain data elements included in the survey had higher rates of non-response than others. This included household ethnicity, cost to park at work, personal cost for transit use after transit subsidies, and employer subsidies for taxis. Interviewer training for these items was increased.
- There were too many activity codes, so the list was reviewed and modified.

1996/97 Dress Rehearsals. In late 1996, NuStats began a second round of pretesting. The procedural rehearsals were designed as a series of "dry runs" to allow measurement of effectiveness and efficiency. Objectives included:

- Discover fresh insights that may be unique about the survey procedures in this region and could be applied to the final preparations for the full study and to an on-going process that collaboratively addressed any newly uncovered barriers, challenges, opportunities, or sub-region peculiarities.
- Practice (rehearse) data collection under close to real conditions, even though the nature of the small rehearsal sample made real conditions impossible to fully replicate.
- Estimate participation rates and productivity levels, as well as patterns of internal variation in the various stages of participation and across the sociodemographically diverse sites included in the rehearsal.
- Secure qualitative feedback from households about the experience of participation and the reasons for not participating so that a system of continuous learning about respondents could be in place during the full survey.
- Test the ability to perform continuous data flow, taking into consideration the ambitious and groundbreaking standards that characterized this data collection and processing model.

To obtain these objectives, the design of the rehearsal called for five sites, generally representative of the 28-county study area, and expected to provide distinct challenges and barriers, as well as the survey participation diversity of the region. The areas selected were a low income, half African American / half Hispanic zip code in the Bronx, a portion of the City of Mineola in Nassau County, the general area of the East Village in Manhattan, a very affluent portion of the City of Scarsdale in Westchester County, and a more middle class suburban town of Paramus in Bergen County, New Jersey. The goal was to collect retrieved travel data from 250 households across these five sites.

The first rehearsal was conducted in October 1996 using the Mineola site. Travel data were collected from a total of 33 households. An analysis of the rehearsal results led to several procedural modifications, including minor changes to the instruments, more detailed training for the interviewers, and further testing of mailing procedures. These modifications were then tested further in a second rehearsal that covered the remaining four sites (Bronx, Manhattan, Paramus, and Scarsdale).

NuStats conducted the second rehearsal from December 1996 through February 1997, in which a total of 182 households reported travel data. The objectives of this rehearsal were to test key procedures and identify areas of improvement or modification for survey administration, instrument design and appearance, CATI programming and scripting, edit checking algorithms, and geocoding procedures. In addition, the majority of respondents were debriefed about their experiences. The rehearsals were beneficial and successful, which, in combination, supported NuStats' conclusion that the time was right to start the full study. The three "benefit" areas of the rehearsals were:

- Household participation rates achieved were high and retrieval rates for most areas were surprisingly higher than expected. Just as importantly, differences among various sociodemographic settings in participation at the several stages of the survey were identified (mostly without surprise), providing valuable insights about how to react to local trends during the full survey.
- Data collection instruments and respondent materials were well received and produced acceptable levels of respondent burden. Feedback from respondents, interviewers, supervisors, and monitors indicate a broad consensus that the field tools for the study worked well.
- With two exceptions, the ambitious standards for continuous data flow appeared to be achievable. The two exceptions (full batch geocoding instead of continuous geocoding and delayed programming of a data structure modification program) were clearly documented and corrected prior to the start of data collection.

1997/98 HIS Data Collection. As its principal feature, the survey was a one-day, place-based diary, collected from household members as defined below, with virtually all the data to be captured by telephone interviewing. The household recruitment was supported by a custom-programmed Computer Assisted Telephone Interviewing (CATI) system. With some modification and refinement, the scope and content of the set of household, person, and activity/trip data items collected were the same as that collected during the dress rehearsals. These resulted in an improved study from that originally proposed and tested in 1995. The improved HIS included:

- customized (to individual home address level) advance letters and mail-out materials, as well as simplified and shortened forms (diaries and instructions) sent to recruited households.
- revamped flow and methods for initial household contact, recruitment, mailing and telephone interactions.
- accommodation for non-English interviewing (Spanish, Mandarin, and Cantonese) through the use of NuStats' bilingual interviewers as well as bilingual interviewers at Ebony Marketing. Bilingual interviewers were provided with a "key terms" sheet to ensure accurate translation of transportation terms. (Note: the majority of interviews took place in English and Spanish, with a small percentage in Chinese).
- Representation of non-telephone households through the use of proxies and a statistical weighting technique.
- avoidance of proxy reporting where possible, with attempted interviews for each adult member for the reporting of the activity portion of the survey.

Data collection took place over 16 months, from February 1997 to May 1998 and required over 50,000 man-hours. More than 250 staff worked on the project (including subcontractor staff). Due to the increasing occurrence of telephone scams in society, concerns about the validity of the project were reflected in calls received from respondents, local government officials, and police departments within the study area.

A toll-free number was maintained for the life of the project, as well as a project email address. Both mechanisms were used by respondents to ask questions about the project, schedule data collection appointments, confirm diary contents, and respond to data correction calls. The concept of scheduling data retrieval appointments worked extremely well, as evidenced by the handful of calls received when appointments were inadvertently missed.

Notable Events. Obviously in a project of this scope and magnitude, many events occurred during the conduct of data collection. Those most worthy of mention include the following:

- **Schedule**. The original project schedule ambitiously showed data collection occurring over a period of four months. As the project got underway, the schedule was slowed down to allow for collection of quality data that would meet project quality standards. Since data collection was conducted over the course of an entire year, this change actually enhanced the seasonality of the data.
- **Weather Events.** Given the geographic location of the study area, a policy concerning weather events was developed and used for this study. Specifically, when extreme bad weather arose, households were re-scheduled to the same day of the following week.
- **Role of Subcontractors**. During the course of the project, NuStats used three firms as subcontractors. Ebony Marketing of the Bronx assisted in early Spring of 1997 with mailing letters and packets to respondents. Due to time and cost considerations, NuStats re-assigned these tasks to DBM of Austin and later assumed the task internally (for Fall 1997 and 1998 phases). NuStats was also assisted in data retrieval by Macro International of Manhattan.
- **Change in Sample Goals**. The sample goals were implemented by monitoring progress on the total column (for each mode leadership density) and the total row (for each county). The ability to effectively conduct a study by meeting the individual sample cell goals was too costly. During the course of the study, oversampling goals were adjusted downward to reflect the small incidence of households in particular cells. The overall sample goal of 11,199 households was not changed.
- **Continuous Data Flow**. In order to accommodate the complexities of collecting a large volume of time-sensitive data using an extremely complex sampling plan, NuStats developed a continuous data flow (CDF) system. This allowed for the movement of data to be tracked by travel day cohort, county, and mode leadership density for all stages of data collection (from sample generation to data delivery). The system was developed and implemented in stages, became fully functional near the conclusion of data collection, and has been successfully modified for several other large-scale data collection efforts across the nation. The benefit of continuous data flow was the tracking and reporting mechanisms, which allowed for real-time identification of problem areas as well as field performance on any given night. It provided a much cleaner method of managing the HIS data collection effort than ever employed in the past.

  The CDF system worked extremely well with the computerized aspects of the study (computer-aided telephone interviewing on advance calls and recruitment, data entry,

geocoding, etc). However, the retrieval interview was conducted using paper-and-pencil and took longer to integrate into the system, particularly considering the time delays involved in conveying sample status and completed interview statistics from subcontractors located in New York City.

- **Use of Edit Check Program**. Parsons Brinckerhoff developed an extensive edit check program that automated the standard data checks for completeness and accuracy of information, as well as more customized approaches to logic checks. Edit check program details are contained in Appendix E. The program also included a speed check element, which used reported travel times and calculated distances between reported origins and destinations (factored to account for curvature of the earth) to evaluate geocoding accuracy. In doing so, this part of the edit check program also uncovered human errors. These included misreported times, missing trips, incorrect modes, geocoding errors, and other problems. These problems were addressed in subsequent data correction efforts.

Survey Process and Procedures

The HIS was conducted using the instruments contained in Appendices A through D, following the procedures summarized below. In general, the project followed an eight-stage process for the conduct of data collection.

Advance Calls. The purpose of the advance calls was to obtain or confirm mailing addresses and briefly introduce potential respondents to the study. As background, the generated sample was either "listed" (a completed address was available) or "unlisted (either the address was incomplete or unavailable). Procedurally, the listed sample was geocoded and the household progressed to the next stage (advance letters). Advance calls were made to the unlisted sample using a carefully scripted message that explained (briefly) the purpose of the study and requested a mailing address in order to mail project information.

The advance call task reassured the respondent of project legitimacy, courteously persuaded respondents to provide initial information, and provided answers to initial questions or concerns. Thus, the interviewers assigned to these calls were briefed more thoroughly on the study purpose and background and were selected for this task based on persuasive qualities, as well as listening and question answering skills.

Advance Notification Mailing. All households were mailed an advance notification letter that explained the study, introduced the sponsors and the firms comprising the research team, and delivered an appeal to participate by emphasizing civic value, individual household importance, and selected intrinsic features of participation. The letter advised the recipient that a professional survey specialist (interviewer) would be calling within a few days to secure the household's participation and to answer questions about the study.

A small, tightly focused brochure was also included in the mailing to provide further details that could not be incorporated into a single page letter. The brochure also provided more detailed information about the team of consultants that were conducting the study, as well as about NYMTC and NJTPA.

The letters were personalized to the household and printed on original-looking letterhead (incorporated into the mail merge master document) that was created specifically for the project. The letter included a scanned signature and was mailed in a windowed envelope. The purpose of the windowed envelope, the design and color of the paper stock, and the use of attractive first class commemorative stamps was to provide an attention-getting effect to maximize the recipient's willingness to open the envelope and read the full letter and brochure. The feedback from respondents in the rehearsal surveys suggested that this perception was clearly achieved. Another criterion followed in the advance mailing package was to not look too extravagant so as to avoid any perceptions of wasteful public spending. This was also achieved, as indicated by respondents who participated in the rehearsals. The advance letter was mailed approximately five days prior to the scheduled recruitment call.

Recruitment Interview. Recruitment calls began in February 1997 and continued through May 1998, with breaks for the summer months and Thanksgiving and Christmas holiday periods. In general, while schools were in session, data collection took place. On average, the recruitment interview lasted 12 minutes.

The purpose of the recruitment interview was to secure participation from the household and to collect baseline demographics and habitual work and school locations. The interview was conducted using computer-aided telephone interviewing (CATI) technology. This provided the interviewer with the appropriate questions to ask, based on responses provided by the person being interviewed. The questionnaire gathered data in three areas: household demographics, person demographics (for all members of the household), and vehicle information.

Placement of Materials. The day following recruitment, the demographic information was used to prepare personalized diaries to send to each member of the household. A personalized cover letter was also prepared and included in the packet, along with an example of how to complete the diary.

Reminder Call. The night prior to the assigned travel day, a reminder call was made to each household to confirm receipt of the packet and answer any last minute questions. At this time, an appointment was made with each household to collect their travel information after their 24-hour diary period ended. If a household had not yet received the packet, the address was confirmed and the household was re-assigned to a later date and a new packet mailed.

Data Retrieval Interview. The day following the travel day (or at the specified callback time), the first attempt to retrieve the travel data was made. Up to six attempts were made to collect travel information for a recruited household. On average, the retrieval interview lasted 35 minutes. There were three parts to the retrieval call: introduction, administration, and data retrieval.

Introduction. During this part of the interview, the survey specialist contacted the household and asked to speak with the household contact person. If not available, the data retrieval began with another available household member.

Administration. This section contained questions that verified important household characteristics, including address, household members, household vehicles, and income. In essence, this section validated the recruitment interview. If household income was refused during the recruitment interview, the interviewer again requested that information during the retrieval interview.

Travel Data retrieval. Starting with the person on the phone, the survey specialist retrieved the household's travel information. All places visited, activities done at those places, and trips made during the 24-hour period were to have been recorded in specially prepared diaries. The interview began by asking "Where were you at 3 a.m. on the travel day?" followed by "And what did you do there?" The next series of questions begin with "Where did you go next?" and "What time did you arrive there?"

Once all information was gathered for the first household member, the interview then focused on the next person. This continued until all data was collected for all household members. If proxy reporting occurred (i.e. one household member reporting diary information for another), the interviewer recorded a "P" to the left of the person's name on the data retrieval form, which was later recorded in the data file.

Once all data was collected for a household, the survey specialist reviewed his/her work. Interviewers were required to complete an Interview Completion Form of key logic checks to certify that they asked the pertinent questions or conducted the necessary logic checks. The survey specialist turned the completed survey in to the supervisor, who reviewed the survey and performed a quality control check. The supervisor certified that the survey was a valid complete and performed any necessary coding. The process worked fairly well, although some interviewers felt that the use of the form slowed them down in the retrieval process. Project management worked closely with supervisors to make sure interviewers consistently and accurately completed the form.

Any errors or inconsistencies noted in the quality check were marked and the survey specialist made a correction call to the household to obtain the correct information. Correction calls were made to approximately one-third of all households and were more prevalent at the start of each data collection stage when interviewers were re-acclimating to the project requirements. Most correction calls were made the same evening as the data retrieval interview. However, as discussed in the geocoding section, some address correction calls were made at a later time.

Data Entry and Processing. All surveys completed in a particular evening were typically entered the following day. (Those completed by the subcontractor were overnighted to NuStats where they underwent a second edit prior to data entry). Data processing was conducted daily. The following are the procedures followed by the data entry and processing staff.

Sample Management Procedures**.** There were two sample files in continuous use throughout the life of the project. The first was on the CATI system. This tracked the outcomes for the nine contact attempts made on each piece of the sample during the advance call and recruitment stages. It was in a file format that was unique to the CATI system and difficult for the project staff to use. It also excluded the retrieval sample, which was on paper. Therefore, a master sample file was kept in a format that can be easily accessed and manipulated by project staff. To keep the master file up to date, the data processing staff ran a program at the end of each recruitment shift that took the CATI dispositions and updated the master sample file. They also manually entered retrieval sample dispositions. At the end of each day, data processing staff collected all retrieval sample and updated the dispositions in the master file. (Note: for the sample under the control of the subcontractor, the only sample updates made were when the completed surveys were received).

Recruitment Data Processing**.** The CATI software stored the data from each completed recruitment interview in a data file, referred to as the "daily" file. Each night after recruitment ended, a program was run to divide the data into three files: Household, Person, and Vehicle. These three "daily" files were used to prepare mailouts and retrieval forms, as well as to geocode frequent locations.

PC Corrections. Sometimes during the recruitment interview, a respondent changed an answer to a particular question. Depending on the stage of the interview, it was not always possible to back up and change the response. In those cases, survey specialists recorded the question, initial response, and correct response on a form. These forms were routed to the data processing staff who updated the database. The data processing staff noted the specific changes made and kept all forms for backup documentation.

Once the above three steps were completed, a program was run to append the daily data to the appropriate master files. (The daily household data were appended to the master household file, the daily person data to the master person file, and the daily vehicle data to the master vehicle file.)

Retrieval Data Processing. Upon completion of the retrieval interview, the data were subjected to two edit checks. The first took place immediately after the interview was completed, using the Interview Completion Form. Once completed, the forms were routed to data entry for processing. Data entry took place using a computer-aided data entry program. The data entry was stored in a daily entry file. At the end of the day, a program was run to pull the address information for a geocoding file. This was sent to the geocoding technician for processing according to geocoding procedures. The data were then subjected to the second stage edit using an edit check program developed by Parsons Brinckerhoff. As documented in Appendix E, this program checked for the following:

Data Edit Checks

Across All Files:

- Range of values for each data item is valid, including values for non-response (logic: responses cannot be outside range).

Household File:

- Compare number of persons in household with number of person records in person file for that household.
- Compare number of vehicles in household with number of vehicle records in vehicle file for that household
- Sum number of trips in trip file for each household record.

Person File:

- Verify that the number of places recorded for each person is at least as many as the number of places the respondent indicates visiting (at start of retrieval interview).
- Check to see if workers went to work on travel day. If not, reason must be provided.
- Check to see if student went to school on travel day. If not, reason must be provided.

Vehicle File

- Check year of vehicle. Flag anything older than 1960 to verify.
- Check body type for entries. Flag if blank.

Place/Trip File:

- Verify that place records exist for each person.
- Verify that household and person records exist for each sample number in the place/trip file.
- Check the travel times: 1. Arrival at place (n) must be before departure from place (n); 2. Arrival at place (n+1) must be after departure from place (n).
- Flag and inspect trips with unusually large implied travel times (e.g. trip to grocery store that takes 6 hours).
- Place numbers must be sequential and inclusive (if the last place number is 5, the file must contain records for places 1, 2, 3, 4, and 5).
- Check to see if the person returned home with their last trip. If not, flag - may have missed a trip.
- Verify that each new place has travel data attached.
- If place is HOME, activity must be a home activity (i.e. not “other activities not-at-home” or “work at other place”)
- If activity is “work at home” or “other activities at home”, place must be HOME.
- If activity is “work at regular jobsite” and place is HOME, verify that the regular workplace is home (refer to person file employment data).

Any discrepancies were flagged and output into a file for corrections or verification. Each day, project staff worked with the file and corrected or verified data as needed.

The process worked fairly well, although it was negatively affected by the time delays in receiving completed surveys from the subcontractor (a major drawback to data retrieval using paper and pencil mode). In addition, the edit check program was not in place at NuStats until after the first phase of data collection ended. Once in place, however, edit checks ran quicker and smoother.

Geocoding. Electronic geographic coding (geocoding) converted written address information into x/y coordinates (latitude/longitude) and attached zonal information (census tracts) for mapping, modeling, and planning purposes. Geocoding was a large component of the Regional Travel - Household Interview Survey, and this section describes the many steps in the

geocoding process. Geocoding occurred at three distinct stages in the survey, after: advance calls, recruitment and retrieval. The following section describes the generic geocoding process.

Geocoding Generally**.** Prior to geocoding, electronic geographic coverage files were prepared in Environmental Systems Research Institute's ArcView GIS Software. This was a two step process, and both of these steps occurred at the beginning of the project only.

1. Obtain Coverage Files. NuStats reviewed many geographic coverage files including Geographic Data Technology's 1992 New York Enhanced Street Network and Caliper's 1995 US Streets (from TIGER). The best coverage files (most comprehensive, complete, and up-to-date) were identified as the NYCPD's 1995 LION files for the City of New York, and Business Location Research's New York Consolidated Metropolitan Statistical Area Street Network 6.0 with Enhanced Address Layers for the remainder of the study area. Both of these files were obtained in MapInfo format and translated into ArcView's proprietary ShapeFile format to ensure seamless coverage for the 28-county study area.
2. Set Up Coverage Files. To make the coverage themes matchable, the files were set up within ArcView. This step included joining county files together, setting the properties for matching, and indexing the files on each computer.

The basic geocoding process consisted of five steps. These steps were performed each time addresses were matched to the geographic coverages.

1. Set Up Event Table. As addresses were submitted for geocoding, an event table of address information was created in dBase format with a field containing concatenated address data. This table was imported into ArcView prior to geocoding.
2. Geocoding. Batch and/or interactive geocoding was performed on all addresses in the files. This included all three address-types described below. Batch runs were automated processes, and interactive sessions found address matches one at a time.
3. Attach coordinates. During geocoding sessions, when an address was geocoded, ArcView calculated and pulled x/y (latitude/longitude) coordinates for the matched cases. The sessions were then saved and exported to a tabular data file that was used to update a master data file. The unmatched cases were exported to a separate data file and manual address research efforts were performed.
4. Address Research. Addresses that did not match were researched and checked against a large array of materials, obtained from Parsons Brinckerhoff, NYMTC, other public agencies, and commercial vendors. The following list categorizes these address research resources.

   A. Electronic Directories
   - Street Atlas USA 3.0 (Delorme)
   - Select Phone 1997 (ProCD)
   - National Database of US Addresses 1995 (Semaphore)
   - "Alias tables" match place names with street addresses; for example, these tables can translate the destination "Radio City Music Hall" into 1260 Avenue of the Americas (or 6th Avenue) which is then assigned a corresponding latitude/longitude coordinate (various)
   - National Research Bureau's Shopping Center Directory on CD-ROM (1997 edition)

   B. Maps, Atlases, Gazetteers, and Street Finders

C. Special Lists
- Major Employers—100+ employers—in Nassau County, Putnam County, Westchester County, Long Island
- School Names/Locations
- Police/Fire Station Addresses
- Buildings/Landmarks/Place names with associated addresses

D. Transit Maps and Schedules

E. Telephone Directories covering 28-county area

Due to the extent and diversity of these holdings, obviously not every resource was relevant in every situation. Each resource was used where it was most appropriate. For example, an alias table was not appropriate for a business with a location given as Rockefeller Center, because it was a multi-block complex; instead the specific business name would be researched in a business database with pre-geocoded locations such as SelectPhone. The research was guided by logically applied techniques to result in higher geocoding "hit rates."

5. Re-geocode. An on-screen, interactive session was run on the unmatched cases once research was completed to determine if the locations could be matched with the updated information.

Steps 2 through 5 were repeated until the desired percentage of addresses are geocoded. In sum, 100% of all home addresses, 95% of all habitual addresses (work or school), and 91% of all remaining trip locations were successfully matched using this process. In addition, the remaining cases were "imputed" to logical points (and flagged appropriately). This resulted in 100% of locations having latitude and longitude points associated with them.

Significant client research supplemented the geocoding effort. This included manual review of records, particularly records associated with transit trips, out of area locations, and those generating speeds higher than what would be typically considered as "normal."

Quality Control Measures and Standards

As part of the contract process, a set of standards or definition criteria for the project were developed. These quality standards included the following:

- *Definition of complete trip/activity information:* All O/D geocodable, all start times and durations passed logic edit check, other data elements complete or inferable in a systematic manner, passed edit check for accounting of activity flow (sequence) using a "tour" approach, and passed edit check for missed-reporting of trips/activities.
- *Definition of complete person information:* Data record identification number verified and validated (connected uniquely to a household), information on work and/or school locations and characteristics.
- *Definition of complete household record:* Completed records for all household members.
- *Definition of acceptable partial record:* Household, person, vehicle, and trip/activity information for all (n) household members who were employed, in school or day care, and complete activity for (n-1) members. The purpose of this definition was to provide a mechanism for retaining data from larger households in which a single person may not report travel/activity data. (Note: while partial households were allowed according to the contract, none were included in the data file.)

- *Tolerance for proxy person reports:* Acceptable if reported by an adult for a minor, or for an adult that completed and/or returned a written diary.
- *Time tolerances for achieving a compiled record in final, edited electronic format:* Identification of households that required call-backs for data clarification mush have been identified within 48 hours of data retrieval (or receipt of hard copy survey from subcontractor), and final cleaned data must have been available within one week of data retrieval (or receipt of hard copy survey). This provided a period for correcting or verifying illogical, incomplete data from respondents and errors from survey workers and assumed that respondents could be reached within that one-week period. In most cases (90%), the respondents were reached successfully within that time period.
- *Tolerance for home address geocoding:* Must have been successfully geocoded to x/y coordinates 100% of the time prior to sending out diary materials.
- *Tolerance for workplace and school geocoding:* Must have been successfully geocoded to x/y coordinates 95% of the time to constitute complete information, with the remaining records imputed to a reasonable location given the context of the available travel information.
- *Tolerance for other trip geocoding:* Must have been successfully geocoded to x/y coordinates 91% of the time, with the remaining records imputed to a reasonable location given the context of the available travel information.

Assessment and Reliability for Modeling

The assessment of data reliability is based on an evaluation of item non-response. Specifically, for key variables to the modeling process, it answers the question of to what extent does the data set contain valid, usable responses. According to the professional guidance developed in conjunction with the development of the NYMTC Best Practices Model, the following variables are critical to fulfilling model specifications:

Household	Person	Trip
Income	Adult or Child	Place type
# vehicles	Worker status	Reported activities
# workers	Work location (primary)	Reported modes
Presence of children	Work location (secondary)	Geocoded trip ends
	Industry Group	Time of departure
	School location	Transit access mode
		Transit egress mode
		Transit boarding station
		Transit exit station

Household Level Variables. In the household file, the key variables are income, number of workers, number of household vehicles, and the presence of children in the household. The determination of item non-response for income and number of household vehicles is straightforward: how many valid answers were provided as compared to answers of "don't know" or "refused". As shown in Table 20, income had a fairly high item non-response rate of 23.6%.

Table 20
Reliability of Household Variables

Household File Variable	Valid Responses	Non-response
Income	76.4%	23.6%
# of vehicles	100.0%	0.0%
# of workers	98.0%	2.0%
Presence of children	99.5%	0.5%

Source: HIS weekday households (weighted).

The number of workers per household and presence of children are variables derived from responses to person level variables. Therefore, it is not possible to have a straightforward determination of non-response. The method used to determine non-response to the household worker summary level variable was three-fold. First, a count of the number of workers within each household was done using a simple Access query followed by a count of refusals to the employment question by household was also done. Next, these responses were combined to determine that 8,715 households reported at least one worker while 182 households refused to report employment status for at least one household member. Finally, the item non-response was calculated as 182 / (8715 + 182) or 2%.

The presence of children in the household was derived by summing the number of respondents under the age of 18 within each household, followed by the number of households that refused age and relationship for at least one household member. Next, these responses were combined to determine that 60 of the 11,264 households had refused age and relationship for at least one household member. This made the item non-response 60 / 11264 or 0.5%.

Income Non-Response. Many recent travel studies have experienced a similar level of income non-response, despite similar efforts to minimize the bias. The methods for compensating for this item non-response are not widely documented. However, some recent sources may provide useful information to modelers in addressing this issue during the modeling phase. Two options appear to be viable: exclude non-responding households from the analysis or impute a household income value using an acceptable method. Examples of each are summarized below and in no way should be accepted at face value. The ultimate decision of how to handle the income non-response should only be made after careful consideration, in conjunction with consultation with the peer review panel and other modeling experts.

In Portland, modelers attempted to impute household income as a function of the value of the residence but could not find a direct correlation. As a result, they treated households that did not provide income as a group (similar to low- or high-income households). When income was an essential element, non-responding households were excluded from the sample.

Table 21 is a reproduction of a table within a 1987 paper on "Issues in the Pre-Analysis of Panel Data" by David Hensher[2] that outlines several methods for data imputation. In essence, Hensher presents two methods: delete missing cases or imputation. He presents seven methods for imputation.

[2] Hensher, David. Issues in the Pre-Analysis of Panel Data. Transportation Research – A, Vol. 21A, No. 4/5, pp. 265-285, 1987.

Table 21
Ad hoc partial ways of unit correction

A	DELETE MISSING CASES
B	FILL IN MISSING CASES – IMPUTATION
	a. *Deductive* – deduce answer from information given from other questions. This is an appealing facility not to be viewed as a default option.
	b. *Grand sample mean* – give average value of total sample. Makes no use of information obtained from sample.
	c. *Class mean* – attempts to take variance in variables being estimated into consideration. It distorts the distribution of a variable, creating spikes at the class mean, attenuating the variance of the distribution (and hence correlation).
	d. *Hot-decking (traditional)* – assign for each variable non-response the variable responses in the same class that the previous (sequential) respondent had given. This is not random assignment. A major problem is that a single response may be denoted to several non-responses when within a class an observation with a missing value is followed by one or more observations with missing values. This attempts to retain the distribution.
	e. *Modified hot-decking*. Sorts out observations into classes and matches responses and non-responses so as to minimize the multiple use of responses. For d and e, we must keep the number of variables used to define groups small in order to avoid introduction of sampling variance by making groups too small.
	f. *Random imputation.* Draws at random a respondent and assigns the non-respondent the selected respondent's level of the variable. This can be random overall or within a class.
	g. *Regression equation*. To predict missing values, using the responses to other variables on the survey as predictor variables and determining the regression coefficients from the respondent sample. Data available for respondents to subsequent waves are used to estimate parameters of a model that predicts variables measured during subsequent waves from variables measured during earlier waves. Then estimated model and data available for non-responders on variables measured during earlier waves are used to obtain estimates of missing values for non-responders on the less observed variables. The approach assumes that the missing data are missing at random, i.e., once differences between responders and non-responders on values of explanatory variables in the model are allowed for, there are no other systematic differences between the responders and non-responders. This approach assumes no error in prediction. In reality, there is error. Unbiased estimates of the mean can be obtained as long as the assumption of similarity of relationships among variables for responders and non-responders are met. Unbiased estimates of variance is not possible, the variance is underestimated, and measures that depend on the variance are inflated.

Source: Hensher article, page 268, Table 2 reproduced in full.

Person Level Variables. The primary modeling variables that come from the person file are adult or child status, worker status, primary and secondary work locations, industry group, and school location. The only calculated variable in this group is the adult or child status. The item non-response for the other variables can be derived by comparing the number of known to unknown responses. Since the adult/child status variable is derived strictly from reported age, item non-response for the age variable was used in Table 22. As shown in Table 22, item non-response is reasonable for all variables except the secondary work location.

Table 22
Reliability of Person Variables

Person File Variable	Valid Responses	Non-response
Adult or Child	96.3%	3.7%
Worker Status	98.8%	1.2%
Primary Work Location	93.6%	6.4%
Secondary Work Location	82.0%	18.0%
Industry Group	96.4%	3.6%
School Location	98.4%	1.6%

Source: Members of HIS households (unweighted).

Trip Level Variables. The most important variables for modeling purposes that are related to trip-making include: place type, reported activities, reported modes, geocoded trip ends, departure time, transit access and egress modes, and transit boarding and exit stations. The item non-response for these variables is shown in Table 23.

Table 23
Reliability of Trip Variables

Trip File Variable	Valid Responses	Non-response
Place Type	100.0%	0.0%
Reported Activities	100.0%	0.0%
Reported Modes	100.0%	0.0%
Geocoded Trip Ends	96.0%	4.0%
Departure Time	100.0%	0.0%
Transit Access Modes	97.1%	2.9%
Transit Egress Modes	97.1%	2.9%
Transit Boarding Stations	99.4%	0.6%
Transit Exit Stations	99.4%	0.6%

Source: Reported trips by HIS households (unweighted).

Place type was reported by respondents and all trip locations have a place type associated with them. The valid responses are home, work, school, and other. Item non-response for reported activities, travel modes, and departure time was determined through direct responses to those variables. All place locations were geocoded; however, those that were “imputed” were considered to be non-response (as the respondent did not provide NuStats with sufficient information to properly geocode the location visited).

Transit access and egress modes were collected as part of the mode reporting sequence. Non-response to these items is defined as those trips that contain only the transit modes and nothing else (i.e., no auto, walk or other mode before or after the transit mode). In the MODE1 variable, there are 2,632 reported trips by transit and thus no reported access mode. Calculation of the egress non-response is more complicated but results in the same non-response rate. Item non-response for the transit boarding and exit stations comes directly from FLAG5 (transit information missing). Of the total transit trips, 92 were missing a boarding station and 89 were missing the exit station.

CONCLUSION

This survey represents a tremendous effort and valuable resource for the transportation planning community in the New York-New Jersey-Connecticut metropolitan area. The scope of the project was such that groundbreaking uses of computer-aided data flow and editing processes were developed, and unprecedented regional cooperation occurred during all phases of the project. Careful survey design and execution have yielded a detailed database of travel information with many applications for years to come.

Appendix A – Advance Mailing Materials

February 3, 1997

«FIRSTNAME» «LASTNAME»
«HOUSE» «STREET» «APARTMENT»
«CITY», «STATE» «ZIP»

Dear «LASTNAME» Family:

Can traffic congestion in «COUNTY» be reduced? Can <<MODE1>> and <<MODE2>> better provide just what «COUNTY» residents need? What do we need most to make the transportation system serve you better in the future? The New York Metropolitan Transportation Council and other participating agencies are conducting the Transportation Futures Project to answer these and other important questions about the future of transportation in the New York metropolitan area. And we need your help! Only by knowing the travel needs of our residents can we make better choices about the future of transportation in our region.

Yours is one of a limited number of households in a scientifically selected sample chosen to represent all of the residents of the metropolitan area. We are asking you to help by telling us about your travel needs, the kinds of trips that you make, and the ways that you make these trips. Your help is vital to the success of the Project because your household, together with a few other families in the «ZIP» ZIP code, will provide the snapshot of travel from your neighborhood. You are essential to our being able to produce a complete and accurate picture of the region.

The way the project works is quite simple. We will ask you about the vehicles and transit services your family uses, the places you go to (working, going to school, shopping, entertainment, etc.) that could require transportation, and we will give each person in your household a diary for recording travel activities for a single day. Participating in this project is interesting because it helps you realize how important transportation is for your everyday activities. And you will know that you are helping us to understand your travel needs and choices.

The information you provide will be used only as part of a scientific sample of households to describe general travel needs. You have my promise that we will protect your privacy and that none of the information about your individual household will be used for any other purpose or provided to any other agency or business.

To complete the project, we have enlisted the help of several private companies, including Parsons Brinckerhoff, NuStats International, and Ebony Marketing Research. The survey specialists from NuStats and Ebony that will call you in the next few days to confirm your participation and to answer any questions that you might have are working strictly within our standards of privacy and confidentiality. Thank you for the 5 to 15 minutes (depending on your family size) we need.

If you have any other questions or concerns about the Project, please call Dr. Floyd Lapp, Director of the Transportation Division, New York City Department of City Planning, at (212) 442-4630. We look forward to having you join us in the Transportation Futures Project.

Sincerely,

Director

What is in it for you?

Security. We promise that your personal information will only be used as part of a group of statistics, *without your name, address or telephone number*. We will respect and protect your privacy.

Awareness. Families that participate in travel surveys become very aware of how they manage their travel and think of ways to manage their transportation time better.

Enjoyment. We will try to make your participation an enjoyable experience by making sure that the staff that talk to you on the phone are well-trained and courteous.

Satisfaction and Thanks. You will contribute to a useful study that will assist in using your tax dollars wisely.

On behalf of the many workers that are involved in this project at the research companies below, we sincerely thank you for your trust, patience, and time.

Participating Agencies:

Parsons Brinckerhoff (PB): New York City-based engineering and planning consulting firm, retained as the primary consultant for the Transportation Futures Project.

NuStats International: Texas-based research consulting company, hired as the sub-consultant for the Transportation Futures Project. With nationally-recognized expertise in the design and conduct of this type of travel survey, NuStats is responsible for survey administration and data collection.

Ebony Marketing Research: Bronx-based marketing research company, working with NuStats to provide assistance on survey administration and local knowledge.

TRANSPORTATION FUTURES PROJECT

WHAT
IT IS

HOW
YOU WERE SELECTED

WHY
YOU SHOULD PARTICIPATE

The principal sponsors of the Transportation Futures Project are public agencies responsible for transportation planning and coordination in their respective jurisdictions. They are the New York Metropolitan Transportation Commission (NYMTC) and the North Jersey Transportation Planning Authority. These agencies act in partnership with 28 other local, regional and state agencies.

What is the Transportation Futures Project?

Preparing for the future and planning the transportation needs of the 21st century require an accurate picture of how people are traveling today. To do this, we ask people

questions about their travel and then use their answers to build a regional information bank that many agencies use when making decisions about transportation.

Every 10 to 15 years, we update this data bank by conducting a regional study.

This is it.

There are many benefits of the Transportation Futures Project for you, your neighbors, and the more than 7 million families in the New York metropolitan region. For example, it will:

Pinpoint how and where highway improvements can reduce congestion

Guide the commuter railroads (Metro North, LIRR, NJTransit) in decisions to expand service

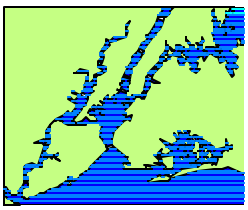
Help decide what subway stations and services need improvement

Determine where and when bus routes need to change to meet people's needs

Identify areas where bike and pedestrian friendly paths can make a nicer future

How (and Why) Your Household Was Selected

About one out of every 550 families or households in the 26 counties of New York,



New Jersey and Connecticut that make up the New York metropolitan region will be invited to participate.

The selection of these households was done by a carefully designed scientific process.

Randomly chosen telephone numbers, like yours, will be contacted by us and invited to participate in the study. Some of the phone numbers have a known or listed addresses, which allows us to contact that household by mail in advance of our phone call. Those households for which no address is available will be contacted first by phone. In either case, we depend on the goodwill of people like you to make this project a success.

You cannot be substituted.

If a selected family does not or cannot participate, we are left with gaps or blanks in the information. We cannot simply call someone else as a replacement. Because each household represents 550 other households, it is very important that you be included.

It *does not* matter if you travel a little or a lot, if you are young or old, or if you are too busy.

YOU are part of the total picture.

Appendix B – Recruitment Interview

Section 1: Introductory Script
Household will have received an advance letter.

A "Hello, my name is [NAME] with the Transportation Futures Project. A few days ago we sent a letter to your home to tell you about this very important project. It is sponsored by the New York Metropolitan Transportation Council. NYMTC is the agency responsible for planning and improving transportation in the region. Did you receive the letter?

1 YES
2 NO
8 DON'T KNOW
9 REFUSED

B As the letter (would have - *if answer to Q.A is anything other than 1*) indicated, we are doing a survey about people's travel patterns and needs. This type of study is done only once every 15 or 20 years; many agencies will use the information I am gathering to make decisions about how to improve the highway and transit systems over the next 20 years.

May I please speak with an adult?

1 HAVE RESPONDENT **Þ SKIP TO D**
2 RESPONDENT NOT AVAILABLE

C When would be a better time to call her/him?

1 YES, ARRANGE CALLBACK **Þ FILL OUT CALLBACK CARD**
2 NO, RESPONDENT NOT AVAILABLE ⇒ **TERMINATE, AUTOMATIC CALLBACK SCHEDULED**

D RESPONDENT ON LINE. I'd like to ask you a few questions. Your answers will remain completely confidential. This will take about 10 minutes. All households that participate in this study have an opportunity to win a pair of airline tickets to any continental U.S. destination. These tickets contributed by a private company, are offered as a token of our appreciation for your time.

1 OK, CONTINUE **Þ SKIP TO E**
REFUSAL:
2 HARD REFUSAL ⇒ **THANK AND TERMINATE**
3 SOFT REFUSAL ⇒ **TERMINATE, AUTOMATIC CALLBACK SCHEDULED**
4 SPECIFIC CALLBACK TIME ARRANGED **Þ FILL OUT CALLBACK CARD**
5 LANGUAGE BARRIER ⇒ **CALLED BACK BY SPECIFIC INTERVIEWER**
6 LANGUAGE BARRIER-OTHER ⇒ **CALLED BACK BY SPECIFIC INTERVIEWER**

E Have I reached you at your home?

1 YES **Þ SKIP TO G**
2 NO, I DON'T LIVE HERE
3 NO, THIS IS NOT A RESIDENCE **Þ THANK AND TERMINATE**

F Can I speak to someone who lives there?

1 YES: QUALIFIED PERSON AVAILABLE **Þ GO BACK TO A**
2 YES: QUALIFIED PERSON NOT AVAILABLE **Þ GO BACK TO B**
3 NO SUCH PERSON **Þ THANK AND TERMINATE**
4 REFUSAL **Þ THANK AND TERMINATE**

G Are you 18 or older?
1 YES Þ **SKIP TO Q1**
2 NO

H May I speak with someone in your household who is 18 or older?
1 ADULT AVAILABLE Þ **GO BACK TO A**
2 ADULT NOT HOME Þ **GO BACK TO B**
3 REFUSED Þ **THANK AND TERMINATE**

Initial questions will introduce project, promote participation, and confirm that respondent is an adult and that residence is in an eligible location.

Q1 Including all cars, trucks, vans, motorcycles and recreational vehicles, whether owned or leased or provided by an employer, how many vehicles are presently available to the members of your household?
00 ZERO Þ **SKIP TO Q6**
01 ONE
02 TWO
03 THREE
04 FOUR
05 FIVE
06 SIX
07 SEVEN
08 EIGHT
09 MORE THAN EIGHT (ENTER EXACT NUMBER _____)
98 DON'T KNOW Þ **THANK AND TERMINATE**
99 REFUSED Þ **THANK AND TERMINATE**

Now I need to get some information about your vehicle(s).

Q2 What's the year of your vehicle? IF TWO OR MORE: "What's the year of vehicle number one, that is, the one used the most", "vehicle number two" and so on.
ENTER LAST 2 DIGITS OF YEAR OF VEHICLE: 19 _____
98 DON'T KNOW
99 REFUSED

Q3 What's the body type? IF TWO OR MORE: "What's the body type of vehicle number one, that is, the one used the most", "vehicle number two" and so on.
01 AUTO SEDAN
02 AUTO 2-SEAT
03 VAN
04 RECREATIONAL VEHICLE
05 UTILITY VEHICLE
06 STATION WAGON
07 PICK-UP TRUCK
08 MOTORCYCLE
09 MOPED
10 OTHER (SPECIFY _____)
98 DON'T KNOW
99 REFUSED

Q4 Is it owned or leased by a household member, an employer, or is it a rental car?

1 HOUSEHOLD OWNED/LEASED
2 EMPLOYER PROVIDED
3 RENTAL CAR
4 BORROWED FROM FRIEND OR RELATIVE
5 OTHER
8 DON'T KNOW
9 REFUSED

Q2 to Q4 to be repeated for each vehicle, up to eight vehicles

Q5 Do you live in a ...

1 SINGLE-FAMILY HOUSE DETACHED FROM ANY OTHER HOUSE
2 SINGLE-FAMILY HOUSE ATTACHED TO ONE OR MORE HOUSES (TOWNHOUSE)
3 BUILDING WITH AT LEAST 2 APARTMENTS (SPECIFY # OF UNITS_____)
4 HOTEL/MOTEL
5 MOBILE HOME OR TRAILER
6 DORMITORY/GROUP QUARTERS/BARRACKS
7 OTHER (SPECIFY) _____
98 DON'T KNOW
99 REFUSED

Q6 What year did you move into this home?

ENTER TWO DIGITS FOR THE YEAR: 19_____
98 DON'T KNOW
99 REFUSED

Q7 Do you own or rent your home?

1 RENT
2 OWN/BUYING (PAYING OFF MORTGAGE)
3 OTHER (SPECIFY) _____
8 DON'T KNOW
9 REFUSED

Section 4: Confirm Participation and Home Address verification Questions 8A to 8F are asked after completing Question 8.

8A For this Transportation Futures Study, we need everyone in your household to write down what they do and where they go for a 24-hour period. We'll send a diary for each person. After the assigned recording time, we'll call again to collect the information.

1 WILLING TO PARTICIPATE

REFUSAL:

1 NOT INTERESTED **Þ THANK AND TERMINATE**
2 NEED TO CHECK WITH OTHER MEMBERS **Þ FILL OUT CALLBACK CARD**
3 INTRUSION OF PRIVACY **Þ THANK AND TERMINATE**
4 GOING OUT OF TOWN **Þ THANK AND TERMINATE**
5 DID NOT RECEIVE LETTER **Þ FILL OUT CALLBACK CARD**
6 TOO BUSY/ NO TIME **Þ THANK AND TERMINATE**
7 ILLNESS IN THE FAMILY **Þ THANK AND TERMINATE**
8 DON'T KNOW / REFUSED **Þ THANK AND TERMINATE**
9 OTHER_____

8B To send the diaries, I need to verify your address {*Computer shows the address*}. I have it as:
{St. Number}
{St. Direction}
{St. Name}
{St. Type}
{Apt. Number}
{City}
{State}
{Zip}

8C Is this correct?
1 YES
2 NO **Þ GO BACK TO 8B**

8D Where would you like to receive your diaries?
1 AT HOME **Þ SKIP TO Q9**
2 P.O. BOX
3 ANOTHER ADDRESS **Þ SKIP TO 8F**
8 DON'T KNOW **Þ THANK AND TERMINATE**
9 REFUSED **Þ THANK AND TERMINATE**

8E P.O. Box Number _____
City _____
State _____
Zip _____ **Þ SKIP TO Q9**

8F ST. NUMBER _____
ST. DIRECTION _____
ST. NAME _____
ST. SUFFIX _____
APT. NUMBER _____
CITY _____
STATE _____
ZIP _____

Q9 Is there anyone in your household who does not understand English?
1 YES
2 NO **Þ SKIP TO Q14**
8 DON'T KNOW **Þ SKIP TO Q14**
9 REFUSED **Þ SKIP TO Q14**

Q10 Will you or anyone else in your household be able to help them fill out the diaries?
1 YES **Þ SKIP TO Q14**
2 NO
8 DON'T KNOW
9 REFUSED

Q11 What is the language[1] they understand?

01 SPANISH
02 FRENCH **Þ SKIP TO Q13**
03 GERMAN **Þ SKIP TO Q13**
04 CHINESE
05 ITALIAN **Þ SKIP TO Q13**
06 TAGALOG **Þ SKIP TO Q13**
07 POLISH **Þ SKIP TO Q13**
08 KOREAN **Þ SKIP TO Q13**
09 INDIC **Þ SKIP TO Q13**
10 VIETNAMESE **Þ SKIP TO Q13**
11 OTHER (SPECIFY _____) **Þ SKIP TO Q13**
98 DON'T KNOW **Þ SKIP TO Q13**
99 REFUSED

Q12 We have instructions for completing the survey in English and {*if response to Q11 is 1*, "Spanish", *if it is 4* "Chinese Mandarin or Cantonese"}. In what language would you like the instructions?

1 ENGLISH
2 CHINESE - MANDARIN
3 CHINESE - CANTONESE
4 SPANISH

Q13 Is there anyone else, a friend or a neighbor, who can help this person fill out the diary?

1 YES
2 NO **Þ THANK AND TERMINATE**
8 DON'T KNOW **Þ THANK AND TERMINATE**
9 REFUSED **Þ THANK AND TERMINATE**

Q14 How many household members, including yourself, all infants and live-in domestic help live in your household?

ENTER THE NUMBER OF MEMBERS: _____
98 DON'T KNOW **Þ THANK AND TERMINATE**
99 REFUSED **Þ THANK AND TERMINATE**

Q15 We need some information about each person in your household, so we can prepare individual diaries. Again, I want to assure you that this information is for research purposes only and will be kept strictly confidential. Earlier, you indicated there were { # } persons in your household.

IF 3 OR MORE PERSONS IN HOUSEHOLD, ASK:
Excluding yourself what is the first name of youngest person in the household?
THEN ASK:
What's the first name of the next youngest person in the household? REPEAT THIS QUESTION UNTIL YOU HAVE NAMES FOR ALL THE OTHER HOUSEHOLD MEMBERS.
FOR THE RESPONDENT ASK:
What is your first name?

IF ONLY 2 PERSONS IN THE HOUSEHOLD, ASK: What is the other person's first name? THEN ASK: What is your first name?

Q15A. What is your last name?
ENTER THE LAST NAME:_____

[1] Source: U.S. Department of Commerce, Bureau of Census, Ethnic and Hispanic Branch, 1990 Census Special Tabulations

Q16 to Q70 are asked for each household member. Respondent's information is retrieved last.

Q16 And what is { NAME }'s gender? ASK THIS QUESTION ONLY FOR OTHER HOUSEHOLD MEMBERS
- 1 MALE
- 2 FEMALE
- 8 DON'T KNOW
- 9 REFUSED

Q17 What is {his/her/your} age in years?
ENTER AGE: _____
- 98 DON'T KNOW
- 99 REFUSED

Q18 {Does/Do} {he/she/you} have a valid driver's license? ASK ONLY IF Q17>15
- 1 YES
- 2 NO
- 8 DON'T KNOW
- 9 REFUSED

Q19 What is {his/her} relationship to you? SKIP FOR PERSON ANSWERING THE TELEPHONE
- 01 SELF
- 02 SPOUSE
- 03 SON/DAUGHTER
- 04 FATHER/MOTHER
- 05 BROTHER/SISTER
- 06 GRANDPARENT
- 07 GRANDCHILD
- 08 LIVE-IN HELP
- 09 ROOM MATE/OTHER NON-RELATED
- 10 OTHER RELATED
- 99 DON'T KNOW/ REFUSED

Q20 {Does/Do} {he/she/you} have a disability that limits the type of transportation {he/she/you} can use?
- 1 YES
- 2 NO Þ **SKIP TO Q22**
- 8 DON'T KNOW Þ **SKIP TO Q22**
- 9 REFUSED Þ **SKIP TO Q22**

Q21 What type of disability? MAXIMUM OF THREE RESPONSES ALLOWED
- 1 VISUAL OR BLIND
- 2 HEARING IMPAIRED OR DEAF
- 3 CANE OR WALKER
- 4 WHEELCHAIR NON-TRANSFERABLE
- 5 WHEELCHAIR TRANSFERABLE
- 6 COGNITIVELY CHALLENGED
- 7 OTHER
- 98 DON'T KNOW
- 99 REFUSED

Q22 {Is/Are} {he/she/you} enrolled in any level of school {or daycare}? ASK "OR DAYCARE" ONLY IF AGE<6.

1 YES
2 NO **Þ SKIP TO Q29 IF AGE >15 ELSE TO Q16**
8 DON'T KNOW **Þ SKIP TO Q29 IF AGE >15 ELSE TO Q16**
9 REFUSED **Þ SKIP TO Q29 IF AGE >15 ELSE TO Q16**

Q23 What type of school {is/are} {he/she/you} enrolled in?

1 DAYCARE
2 PRE-SCHOOL
3 KINDERGARTEN TO ELEMENTARY (GRADES K-6)
4 SECONDARY SCHOOL (GRADES 7-12)
5 VOCATIONAL/TECHNICAL SCHOOL
6 COLLEGE OR UNIVERSITY
7 ADULT SCHOOL
8 DON'T KNOW
9 REFUSED

Q24 What is the name of the school {he/she/you} {is/are} enrolled in?

1 NAME GIVEN: _____
98 DON'T KNOW
99 REFUSED

Q25 What is the address?

1 COMPLETE STREET ADDRESS KNOWN/GIVEN
2 CROSS STREETS KNOWN/GIVEN
98 DON'T KNOW
99 REFUSED

If complete address:
- ST NUMBER
- ST DIRECTION
- ST NAME
- ST TYPE
- APT/STE
- CITY
- STATE
- ZIP

If cross streets
- ST#1 DIRECTION
- ST#1 NAME
- ST#1 TYPE
- ST#2 DIRECTION
- ST#2 NAME
- ST#2 TYPE
- CITY
- STATE
- ZIP

Q26 How many days a week {does/do} {he/she/you} go to school?

1 1
2 2
3 3
4 4
5 5
6 6
7 7
8 DON'T KNOW
9 REFUSED

Q27 On one typical day how {does/do} {he/she/you} get to school? MULTIPLE RESPONSES ALLOWED BUT NOT EXPLICITLY REQUESTED

11 WALK
12 WHEELCHAIR
13 IN-LINE SKATES, ROLLER-SKATES
14 BICYCLE
21 AUTO DRIVER
22 AUTO PASSENGER
23 MOTORCYCLE/MOPED
31 GROUP RIDE (CARPOOL, VANPOOL, ETC.)
41 STANDARD LOCAL BUS
42 SCHOOL BUS
43 COMMUTER VAN/SHUTTLE BUS: FROM EMPLOYER OR GRP CONTRACT
44 COMMUTER VAN OR JITNEY, DIAL-A-BUS (PAY FARE)
45 EXPRESS BUS
46 CHARTER BUS
47 AIRPORT LINE
51 AMTRAK, GREYHOUND, AIRLINE, HELICOPTER
61 SUBWAY (INCLUDES NYCMTA)
62 PATH
63 NEWARK CITY SUBWAY
71 FERRY (INCLUDING ROOSEVELT ISLAND TRAM)
81 COMMUTER RAILROAD (LIRR, METRO NORTH, NJTRANSIT)
91 YELLOW/MEDALLION CAB
92 FOR HIRE VAN/JITNEY
93 CAR SERVICE (BLACK CAR)
94 GYPSY CAB
97 OTHER
98 DON'T KNOW
99 REFUSED

Q28 How much does it cost to park at or near the school?
ENTER THE AMOUNT AND THEN THE UNIT OF PAYMENT. ENTER $0.00 IF FREE
AMOUNT:
$ ___ ___ . ___ ____
999998 Don't know
999999 Refused

SELECT UNIT OF PAYMENT:

0 FREE
1 PER HOUR
2 PER DAY
3 PER WEEK
4 PER MONTH
5 PER QUARTER
6 PER SEMESTER
7 PER SCHOOL YEAR
8 DON'T KNOW
9 REFUSED

If age is 15 or under skip to Q16 for the next household member

Q29 {Is/Are} {he/she/you} employed?
1 YES Þ **SKIP TO Q31**
2 NO
8 DON'T KNOW
9 REFUSED

Q30 {Is/Are} {he/she/you} ...
1 RETIRED Þ **SKIP TO Q16 FOR NEXT HOUSEHOLD MEMBER**
2 HOMEMAKER Þ **SKIP TO Q16 FOR NEXT HOUSEHOLD MEMBER**
3 UNEMPLOYED BUT LOOKING FOR WORK Þ **SKIP TO Q16 FOR NEXT HOUSEHOLD MEMBER**
4 UNEMPLOYED AND NOT SEEKING EMPLOYMENT Þ **SKIP TO Q16 FOR NEXT HOUSEHOLD MEMBER**
5 STUDENT (PART TIME OR FULL TIME) Þ **SKIP TO Q16 FOR NEXT HOUSEHOLD MEMBER**
8 DON'T KNOW Þ **SKIP TO Q16 FOR NEXT HOUSEHOLD MEMBER**
9 REFUSED Þ **SKIP TO Q16 FOR NEXT HOUSEHOLD MEMBER**

Q31 {Does/Do} {he/she/you} have more than one job?
1 YES
2 NO
8 DON'T KNOW
9 REFUSED

I am going to ask some questions about {his/her/your} {main, *only if Q31 is 1}* job.

Q32 Is {his/her/your} employer . . .
1 A PRIVATE COMPANY,
2 GOVERNMENT,
3 SELF-EMPLOYED
4 OR, SOMETHING ELSE (SPECIFY _____)
98 DON'T KNOW
99 REFUSED

Q33 What activity best describes {his/her/your} job?
01 AGRICULTURE, FORESTRY, FISHERIES
02 MINING
03 CONSTRUCTION
04 MANUFACTURING - NONDURABLE GOODS
05 MANUFACTURING - DURABLE GOODS
06 TRANSPORTATION
07 COMMUNICATIONS, OTHER PUBLIC UTILITIES
08 WHOLESALE TRADE
09 RETAIL TRADE
10 FINANCE, INSURANCE, OR REAL ESTATE
11 BUSINESS AND REPAIR SERVICES
12 PERSONAL SERVICES
13 ENTERTAINMENT, OR RECREATION SERVICES
14 HEALTH SERVICES
15 EDUCATIONAL SERVICES
16 OTHER PROFESSIONAL AND RELATED SERVICES
17 PUBLIC ADMINISTRATION
97 OTHER (SPECIFY _____)
98 DON'T KNOW
99 REFUSED

Q34 How would you describe {his/her/your} occupation?

01 EXECUTIVE, ADMINISTRATIVE, OR MANAGERIAL
02 PROFESSIONAL SPECIALTY
03 TECHNICIAN AND RELATED SUPPORT
04 SALES
05 ADMINISTRATIVE SUPPORT, CLERICAL
06 PRIVATE HOUSEHOLD
07 PROTECTIVE SERVICE
08 SERVICE, EXCEPT PROTECTIVE AND HOUSEHOLD
09 FARMING, FORESTRY, OR FISHING
10 PRECISION, PRODUCTION, CRAFT, OR REPAIR
11 MACHINE OPERATOR, ASSEMBLER, OR INSPECTOR
12 TRANSPORTATION, OR MATERIAL MOVING
13 HANDLER, EQUIPMENT CLEANER, HELPER, OR LABORER
97 OTHER (SPECIFY _____)
98 DON'T KNOW
99 REFUSED

Q35 How long {has/have} {he/she/you} been working at this job?

ENTER THE NUMBER OF YEARS: _____ (00=LESS THAN 1 YEAR)
98 DON'T KNOW
99 REFUSED

Q36 On average, how many days per week {does/do} {he/she/you} work at {his,her,your} job regardless of location?

1 1
2 2
3 3
4 4
5 5
6 6
7 7
8 DON'T KNOW
9 REFUSED

Q37 On average, how many days per week {does/do} {he/she/you} work at home for {his,her,your} job instead of going to {his/her/your} workplace? Sometimes this is called telecommuting.

00 NONE/NEVER
01 1
02 2
03 3
04 4
05 5
06 6
07 7
97 OTHER (SPECIFY _____) (THIS INCLUDES ONCE A MONTH)
98 DON'T KNOW
99 REFUSED

Q38 {Does/Do} {he/she/you} work a compressed work week, such as 80 hours in 9 days, or 40 hours in 4 days?

1 YES
2 NO Þ **SKIP TO Q40**
8 DON'T KNOW Þ **SKIP TO Q40**
9 REFUSED Þ **SKIP TO Q40**

Q39 {Does/Do} {he/she/you} work four days per week (4/40) or nine days per two weeks (9/80)?
1 9/80
2 4/40
3 OTHER (SPECIFY _____)
8 DON'T KNOW
9 REFUSED

Q40 {Does/Do} {he/she/you} regularly work weekends?
1 YES
2 NO Þ **SKIP TO Q42**
8 DON'T KNOW Þ **SKIP TO Q42**
9 REFUSED Þ **SKIP TO Q42**

Q41 When in the weekend {does/do} {he/she/you} work? MULTIPLE RESPONSES ALLOWED
1 SATURDAY AM
2 SATURDAY PM
3 SUNDAY AM
4 SUNDAY PM
5 OTHER (SPECIFY _____)
8 DON'T KNOW
9 REFUSED

Q42 What is the name of {his/her/your} employer?
1 MAIN JOB NAME: _____
98 DON'T KNOW
99 REFUSED

Q43 What is the address of this workplace?
1 HOME Þ **SKIP TO Q46**
2 COMPLETE STREET ADDRESS KNOWN/GIVEN
3 CROSS STREETS KNOWN/GIVEN
8 DON'T KNOW
9 REFUSED

If complete address:
ST NUMBER
ST DIRECTION
ST NAME
ST TYPE
APT/STE
CITY
STATE
ZIP

If cross streets:
ST#1 DIRECTION
ST#1 NAME
ST#1 TYPE
ST#2 DIRECTION
ST#2 NAME
ST#2 TYPE
CITY
STATE
ZIP

Q44 What {does/do} {he/she/you} use most often to get to work? MULTIPLE RESPONSES ALLOWED BUT NOT EXPLICITLY REQUESTED

1 WALK
2 WHEELCHAIR
3 IN-LINE SKATES, ROLLER-SKATES
4 BICYCLE
5 AUTO DRIVER
6 AUTO PASSENGER
7 MOTORCYCLE/MOPED
8 GROUP RIDE (CARPOOL, VANPOOL, ETC.)
9 STANDARD LOCAL BUS
10 SCHOOL BUS
11 COMMUTER VAN/SHUTTLE BUS: FROM EMPLOYER OR GRP CONTRACT
12 COMMUTER VAN OR JITNEY, DIAL-A-BUS (PAY FARE)
13 EXPRESS BUS
14 CHARTER BUS
15 AIRPORT LINE
16 AMTRAK, GREYHOUND, AIRLINE, HELICOPTER
17 SUBWAY (INCLUDES NYCMTA)
18 PATH
19 NEWARK CITY SUBWAY
20 FERRY (INCLUDING ROOSEVELT ISLAND TRAM)
21 COMMUTER RAILROAD (LIRR, METRO NORTH, NJTRANSIT)
22 YELLOW/MEDALLION CAB
23 FOR HIRE VAN/JITNEY
24 CAR SERVICE (BLACK CAR)
25 GYPSY CAB
97 OTHER
98 DON'T KNOW
99 REFUSED

Q45 [IF Q44=21,22 OR 31] How many other people travel with {him/her/you} to work, excluding himself/herself/yourself?

00 NONE
01 1
02 2
03 3
04 4
05 5
06 6
07 7
08 8
10 OTHER (SPECIFY _____)
98 DON'T KNOW
99 REFUSED

Q46 {Does/Do} {he/she/you} usually need a vehicle at work for business purposes? (For example, sales calls or client meetings)

1 YES
2 NO
8 DON'T KNOW
9 REFUSED

Q47 How much does it cost to park at work (home)? If {he/she/you} {doesn't/don't} drive, please estimate how much parking would cost.
ENTER THE AMOUNT AND THEN THE UNIT OF PAYMENT. ENTER $0.00 IF FREE
ENTER AMOUNT:
$ ___ ___ . ___ ____
999998 DON'T KNOW
999999 REFUSED

SELECT UNIT OF PAYMENT:
0 FREE
1 PER HOUR
2 PER DAY
3 PER WEEK
4 PER MONTH
5 PER QUARTER
6 PER SEMESTER
7 PER SCHOOL YEAR
8 DON'T KNOW
9 REFUSED

Q48 Does {his/her/your} employer offer to pay for all or part of the cost of parking at work? [SKIP IF Q32 = 3]
1 YES
2 NO
8 DON'T KNOW
9 REFUSED

Q49 [IF Q44=21, 31] How much {does/do} it cost {him/her/you} personally to park at work? If {he/she/you} {doesn't/don't} drive, please estimate how much parking would cost.
[SKIP IF Q32 = 3]
ENTER THE AMOUNT AND THEN THE UNIT OF PAYMENT. ENTER $0.00 IF FREE
ENTER AMOUNT:
$ ___ ___ . ___ ____
999998 DON'T KNOW
999999 REFUSED
SELECT UNIT OF PAYMENT:
0 FREE
1 PER HOUR
2 PER DAY
3 PER WEEK
4 PER MONTH
5 PER QUARTER
6 PER SEMESTER
7 PER SCHOOL YEAR
8 DON'T KNOW
9 REFUSED

Q50 What kind of parking is available at or close to work/home?
1 IN A PARKING LOT OR GARAGE AT WORK
2 IN A PARKING LOT OR GARAGE OFF-SITE
3 ON THE STREET
4 IN A PARKING LOT OR GARAGE AT HOME **Þ SKIP TO Q52**
8 DON'T KNOW
9 REFUSED

Q51 How long in minutes does {he/she/you} or would {he/she/you} walk from this parking area to work?
ENTER THE MINUTES: _____
98 REFUSED
99 DON'T KNOW

Q52 Does {his/her/your} employer offer TransitChek or some other way to pay for all or part of the cost of using transit? [SKIP IF Q44 = 21 22 23]
1 YES, ALL OR PART
2 NO Þ **SKIP TO Q54**
8 DON'T KNOW Þ **SKIP TO Q54**
9 REFUSED Þ **SKIP TO Q54**

Q53 {Does/Do} {he/she/you} take advantage of it? [SKIP IF Q44 = 21 22 23]
1 YES
2 NO
8 DON'T KNOW
9 REFUSED

Q54 What does it personally cost {him/her/you} to buy a bus/rail pass? [SKIP IF Q44 = 21 22 23]. ENTER THE AMOUNT AND THEN SELECT THE UNIT. [ENTER $0.00 IF FREE]
ENTER THE AMOUNT:
$ ___ ___ . ___ ____
999998 DON'T KNOW
999999 REFUSED

SELECT THE UNIT OF PAYMENT:
0 FREE
1 PER DAY
2 PER WEEK
3 PER MONTH
4 PER YEAR
5 _____
8 DON'T KNOW
9 REFUSED

Q55 At {his/her/your} regular job, does {he/she/you} work a schedule or shift that changes on a regular basis?
1 YES
2 NO Þ **SKIP TO Q57**
8 DON'T KNOW Þ **SKIP TO Q57**
9 REFUSED Þ **SKIP TO Q57**

Q56 How often does the shift change?
1 EVERY DAY
2 EVERY WEEK
3 EVERY MONTH
4 EVERY QUARTER
5 OR SOMETHING ELSE (SPECIFY _____)
98 DON'T KNOW
99 REFUSED

Q57 What time does {he/she/you} typically start work at {his/her/your} job?
___ ___ : ___ ___ [ENTER THE TIME]

Is this A.M. or P.M.?
1 A.M.
2 P.M.
98 DON'T KNOW
99 REFUSED

Q58 What time does {he/she/you} typically end work at {his/her/your} job?
___ ___ : ___ ___ [ENTER THE TIME]
Is this A.M. or P.M.?
1 A.M.
2 P.M.
98 DON'T KNOW
99 REFUSED

Q59 Are {his/her/your} start and end times at this job about the same every day?
1 YES **Þ SKIP TO Q62**
2 NO
8 DON'T KNOW **Þ SKIP TO Q62**
9 REFUSED **Þ SKIP TO Q62**

Q60 How much can {his/her/your} job's start times vary from the usual start time?
1 START TIME CANNOT VARY
2 WITHIN 15 MINUTES OR LESS
3 16 TO 30 MINUTES
4 31 TO 60 MINUTES
5 MORE THAN 1 HOUR TO 2 HOURS
6 OR, SOMETHING ELSE (SPECIFY _____)
8 DON'T KNOW
9 REFUSED

Q61 How much can {his/her/your} job's end times vary from the usual end time?
1 END TIME CANNOT VARY
2 WITHIN 15 MINUTES OR LESS
3 16 TO 30 MINUTES
4 31 TO 60 MINUTES
5 MORE THAN 1 HOUR TO 2 HOURS
6 OR, SOMETHING ELSE (SPECIFY _____)
8 DON'T KNOW
9 REFUSED

The following questions are asked only if response to Q31 is 1. Otherwise go to next household member.

Q62 What is the name of {his/her/your} second employer?
1 SECOND JOB NAME: _____
98 DON'T KNOW
99 REFUSED

Q63 Is {his/her/your} second employer ...
1 A PRIVATE COMPANY
2 GOVERNMENT
3 HIMSELF/HERSELF (SELF-EMPLOYED)
7 OR, SOMETHING ELSE (SPECIFY _____)
98 DON'T KNOW
99 REFUSED

Q64 What is the address of {his/her/your} second workplace?

1 COMPLETE STREET ADDRESS KNOWN/GIVEN
2 CROSS STREETS KNOWN/GIVEN
8 DON'T KNOW
9 REFUSED

IF COMPLETE ADDRESS:

ST NUMBER
ST DIRECTION
ST NAME
ST TYPE
APT/STE
CITY
STATE
ZIP

IF CROSS STREETS:

ST#1 DIRECTION
ST#1 NAME
ST#1 TYPE
ST#2 DIRECTION
ST#2 NAME
ST#2 TYPE
CITY
STATE
ZIP

Q65 What activity best describes {his/her/your} second job?

01 AGRICULTURE, FORESTRY, FISHERIES
02 MINING
03 CONSTRUCTION
04 MANUFACTURING - NONDURABLE GOODS
05 MANUFACTURING - DURABLE GOODS
06 TRANSPORTATION
07 COMMUNICATIONS, OTHER PUBLIC UTILITIES
08 WHOLESALE TRADE
09 RETAIL TRADE
10 FINANCE, INSURANCE, OR REAL ESTATE
11 BUSINESS AND REPAIR SERVICES
12 PERSONAL SERVICES
13 ENTERTAINMENT, OR RECREATION SERVICES
14 HEALTH SERVICES
15 EDUCATIONAL SERVICES
16 OTHER PROFESSIONAL AND RELATED SERVICES
17 PUBLIC ADMINISTRATION
97 OTHER (SPECIFY _____)
98 DON'T KNOW
99 REFUSED

Q66 How would you describe {his/her/your} occupation at {his/her/your} second job?

01 EXECUTIVE, ADMINISTRATIVE, OR MANAGERIAL
02 PROFESSIONAL SPECIALTY
03 TECHNICIAN AND RELATED SUPPORT
04 SALES
05 ADMINISTRATIVE SUPPORT, CLERICAL
06 PRIVATE HOUSEHOLD
07 PROTECTIVE SERVICE
08 SERVICE, EXCEPT PROTECTIVE AND HOUSEHOLD
09 FARMING, FORESTRY, OR FISHING
10 PRECISION, PRODUCTION, CRAFT, OR REPAIR
11 MACHINE OPERATOR, ASSEMBLER, OR INSPECTOR
12 TRANSPORTATION, OR MATERIAL MOVING
13 HANDLER, EQUIPMENT CLEANER, HELPER, OR LABORER
14 OTHER (SPECIFY _____)
98 DON'T KNOW
99 REFUSED

Q67 On average, how many days per week does {he/she/you} work at {his/her/your} second job?

1 1
2 2
3 3
4 4
5 5
6 6
7 7
8 DON'T KNOW
9 REFUSED

Q68 On average, how many days per week does {he/she/you} work at home for {his/her/your} second job instead of going to {his/her/your} workplace? Sometimes this is called telecommuting.

00 NONE/NEVER
01 1
02 2
03 3
04 4
05 5
06 6
07 7
97 OTHER (SPECIFY _____) (THIS INCLUDES ONCE A MONTH)
98 DON'T KNOW
99 REFUSED

Q69 What time does {he/she/you} typically start work at {his/her/your} second job?

___ ___ : ___ ___ [ENTER THE TIME]

Is this a.m. or p.m.?

1 A.M.
2 P.M.
8 DON'T KNOW
9 REFUSED

Q70 What time does {he/she/you} typically end work at {his/her/your} second job?

___ ___ : ___ ___ [ENTER THE TIME]

Is this a.m. or p.m.?

1 A.M.
2 P.M.
8 DON'T KNOW
9 REFUSED

Q16 to Q70 are repeated for each of the other household members in ascending age order; the sequence is then asked (in the second person) for the Household Informant that is being interviewed.

Q71 As I said earlier, we'll send you a diary for each household member to complete. Now I just have a few more questions about your household.

Q72 How many separate telephone numbers are there to your current home?

_____ (IF 1 Þ **SKIP TO Q74**)

98 DON'T KNOW
99 REFUSED

Q73 How many of these telephone numbers, if any, are dedicated to a FAX machine or modem?

_____

98 DON'T KNOW
99 REFUSED

Q74 In the past 12 months, have there been times, even for a few days, when you did not have phone service at your home?

1 YES
2 NO **Þ SKIP TO Q76**
8 DON'T KNOW **Þ SKIP TO Q76**
9 REFUSED **Þ SKIP TO Q76**

Q75 How long were you without a phone service?

1 LESS THAN 2 WEEKS
2 2 WEEKS TO LESS THAN 1 MONTH
3 1 MONTH TO LESS THAN 3 MONTHS
4 3 MONTHS TO LESS THAN 6 MONTHS
5 6 MONTHS TO LESS THAN 1 YEAR
8 DON'T KNOW
9 REFUSED

Q76 Does your household share a phone line with another household?

1 YES
2 NO **Þ SKIP TO Q78**
98 DON'T KNOW **Þ SKIP TO Q78**
99 REFUSED **Þ SKIP TO Q78**

Q77 How many households share a phone line with your household?

ENTER THE NUMBER OF HOUSEHOLDS: _____

98 DON'T KNOW
99 REFUSED

Q78 Which of the following best describes your ethnicity?

01 BLACK/AFRICAN AMERICAN, NON-HISPANIC
02 WHITE, NON-HISPANIC
03 ASIAN/PACIFIC ISLANDER
04 AMERICAN INDIAN
05 HISPANIC
06 OTHER (SPECIFY _____)
98 DON'T KNOW
99 REFUSED

Q79 What was your total annual household income last year from all sources before taxes, for all members of your household? I will read you a series of income ranges. Please stop me when I read the range that is closest to your household's.

01 less than $10,000
02 $10,000 to $14,999
03 $15,000 to $24,999
04 $25,000 to $34,999
05 $35,000 to $49,999
06 $50,000 to $74,999
07 $75,000 to $99,999
08 $100,000 to $124,999
09 $125,000 to $149,999
10 $150,000 or more
98 DON'T KNOW
99 REFUSED

Section 9: Travel Day determination
These questions are asked at the end of the interview, after the respondent has answered question 79.

79A Now let me give you the day on which we would like for everyone in your household to keep track of their activities.
The day is "[DAY OF THE WEEK AND DATE]." Is this day OK?
1 YES
2 NO Þ **FILL OUT CALLBACK CARD**
Enter Assignment Number _____

79B Are you expecting any out-of-town guests on that date?
1 YES Þ **REASSIGN TO DATE WHEN NO VISITORS**
2 NO
8 DON'T KNOW
9 REFUSED

79C I'd like to verify that I reached you at {PHONE NUMBER}. Is this correct?
1 NUMBER IS CORRECT
2 NUMBER IS INCORRECT (TYPE CORRECT NUMBER _____)

79D I'll call to collect your activity information the day following your travel day, which is next [day]. When I call, would you prefer to be called in the morning between 9:00 and noon., in the afternoon between noon and 5:00 p.m., or in the evening between 5:00 and 9:00 p.m.?"
1 MORNING (9:00 - noon.)
2 AFTERNOON (noon - 5:00 P.M.)
3 EVENING (5:00 - 9:00 P.M.)
4 NO BEST TIME TO CALL
9 DON'T KNOW/REFUSE

79E Is there a different phone number where you or another member of your household would prefer to be called when we collect your information?
1 YES
2 NONE Þ **SKIP TO 79F**
8 DON'T KNOW Þ **SKIP TO 79F**
9 REFUSED Þ **SKIP TO 79F**

79F What is that phone number?

ENTER THE PHONE NUMBER: _____

79G Thank you very much for helping us. We'll call you on the evening of [DAY] to make sure you received your diaries and to answer any questions. We also want you to know that by writing down complete and accurate answers in the diaries -- including full addresses for each place you visit during the diary day -- you'll help to make the transportation system better. If you have any questions or comments about the study, you can all the Transportation Futures Study at 1-800-619-3601. Thank you and have a nice evening/day.
Thank you for taking the time to talk to us today.
That completes the survey. On behalf ..... I'd like to thank you for your time and participation.

Appendix C – Survey Materials

Sample Packet Letter

TRANSPORTATION FUTURES PROJECT

NEW YORK METROPOLITAN TRANSPORTATION COUNCIL
1 World Trade Center, Suite 82 East
New York, NY 10048-0042

NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY, INC
One Newark Center, 17th Floor
Newark, NJ 07102-1982

PARSONS BRINCKERHOFF
One Penn Plaza
2nd Floor
New York, NY 10119-0061

NUSTATS INTERNATIONAL
3006 Bee Caves Road
Suite A-300
Austin, TX 78746

EBONY MARKETING RESEARCH
2100 Bartow Avenue
Suite 243
Baychester Bronx, NY 10475

March 1, 1997

«RESPFNAME» «RESPLNAME»
«STNUM» «STDIR» «STNAM» «STTYP» «SUITE»
«CITY» «STATE» «ZIP1»

Dear «RESPFNAME» «RESPLNAME»:

Thank you for agreeing to participate in the **Transportation Futures Project**. In addition to the information you have kindly provided, we need a record of one day of travel and activities from every person in the family. The enclosed materials are what you need for recording the information we will need. **The most important is the diary that should be used by each person.**

Please take a moment to check that the information below about your vehicles and household members. If we made a mistake, please let us know when we call you so we can correct it.

YOUR HOUSEHOLD:

Household Member Name	Age	Gender	Employed	Occupation	Industry
«FNAME1»	«AGE1»	«GENDER1»	«EMPLOY1»	«W1OCC1»	«W1IND1»
«FNAME2»	«AGE2»	«GENDER2»	«EMPLOY2»	«W1OCC2»	«W1IND2»
«FNAME3»	«AGE3»	«GENDER3»	«EMPLOY3»	«W1OCC3»	«W1IND3»

YOUR VEHICLES:
Please verify your vehicle information. Please record the information even if the vehicle is not used.

Year	Type
«VHYR1»	«VHTYP1»
«VHYR2»	«VHTYP2»

Your participation is important toward meeting these goals. **All information collected is strictly confidential and will be used for research purposes only.** The information your household records in the enclosed diaries will be combined with data from all other participating area residents.

We very much appreciate your taking the time to help with this worthwhile project. All households that participate in this study have an opportunity to win a pair of airline tickets to any continental U.S. destination. These tickets contributed by a private company, are offered as a token of our appreciation for your time. If you have any questions or comments, please call me at 1-800-619-3601.
Sincerely,
Stacey Bricka
Project Manager

Figure 2
Appreciation Notice

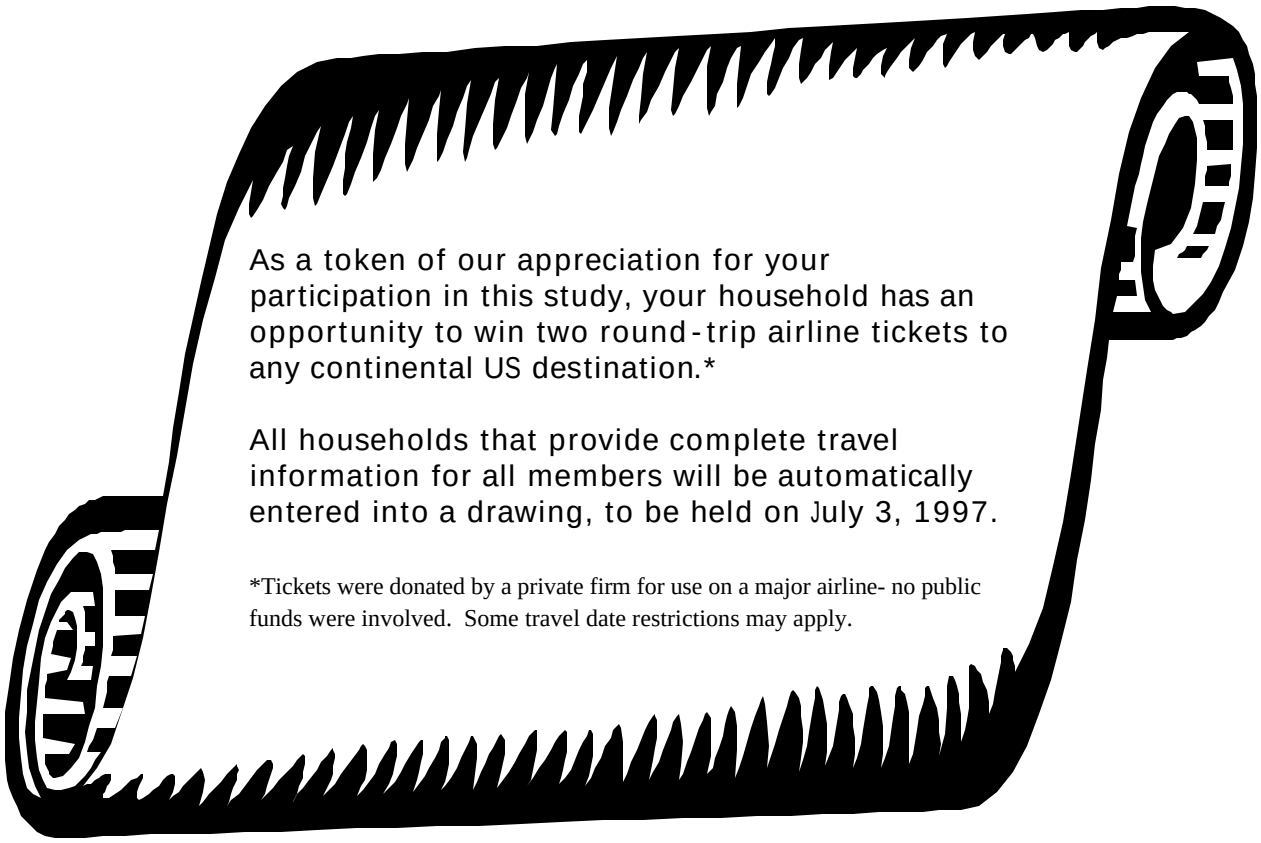


Figure 3
Refrigerator Magnet

S

Your Personal One-Day Travel Diary

Prepared Especially For:

TRANSPORTATION FUTURES PROJECT

This is your personal diary.

Each person needs to complete a 24-hour diary of **PLACES** visited (what and where they are) and **TRIPS** made (when and how you make these trips). We also ask what **ACTIVITIES** you do in each **PLACE**.

The main items you need to keep track of are:

- **PLACES** you go to, by name and/or address *as exact as possible*;
- **TIMES** you leave from and arrive at these places, *to the minute if possible*;
- **ACTIVITIES** you do at each place; and
- **MODES** or methods of travel you use to go from place to place. Frequently, it can be several, such as *walk* to bus stop, take *bus* to subway, take *subway* to midtown, *walk* from subway station to the workplace.

The day after your travel day, we will call you to collect all of the information by phone. We will help deal with any gaps and ask about parking, transit, tolls, and other details of how you travel.

For young children and for those who cannot complete a diary by themselves, we ask that a parent or other adult complete the diary for them.

Please note that specific and exact details are very important.

shown in the enclosed Example Diary (ivory colored), you should use one page for ch **PLACE** you go to during your 24-hour day.

hat is a PLACE? It is every different location (different building, different address) u travel to during the day. It can be a school where you stay seven hours, or a soline station you are at for only 5 minutes to get gas, or your son's school where you op for only 30 seconds to drop him off, or a restaurant where you have lunch. A **LACE** is any location you stop at, even if it's just on your way to work or to somewhere se.

ou start your 24-hour day at home, then **PLACE** #1 will be your home. After that, ch new **PLACE** you go to will have one new page in your diary. There are 12 pages **PLACES** and another page for an additional six. If you need more space, please e additional sheets of paper to record the extra information.

ew other important tips:

Any time you drop someone off or pick someone up, you should record that location as a **PLACE** in your diary.

Make sure you check off all **ACTIVITIES** you do at each **PLACE**.

If you make trips in the day as part of your work (as a mail carrier, or delivery person, or outside sales rep), record only your trip from home to your first work place and from your last work place to where you went after work.

Please call the Transportation Futures Hotline toll free at 1-800-619-3601 if you have any questions.

Thank you for helping the Transportation Futures Project!

TYPES OF TRANSPORTATION FOR:

"HOW did you get from Place to Place?"

WALK
WHEELCHAIR
IN-LINE OR ROLLER SKATES
BICYCLE
AUTO AS THE DRIVER
AUTO AS THE PASSENGER
MOTORCYCLE / MOPED
GROUP RIDE / (CARPOOL. ETC)
STANDARD LOCAL BUS
SCHOOL BUS
COMMUTER VAN/SHUTTLE BUS
COMMUTER VAN OR JITNEY
EXPRESS BUS
CHARTER BUS
AIRPORT BUS / SHUTTLE
AMTRAK,GREYHOUND,AIRLINE
SUBWAY(NYC, STATEN ISLAND RAIL)
PATH
NEWARK CITY SUBWAY
FERRY(ROOSEVELT ISLAND TRAM)
COMMUTER RAIL(LIRR,NJTRANSIT)
YELLOW/MEDALLION CAB
FOR HIRE VAN/JITNEY
BLACK CAB CAR SERVICE
GYPSY CAB

Place #

1

START HERE

For this diary, your day begins at 3:00 am. Most people are home asleep at 3:00 am. If this is the case, then check "My Home," make note of the exact time you left home for the first time on your diary day, and check all the activities you did before leaving home.

(Complete the information below if you have not already provided it)

I My Home
I My Regular Workplace
I My School
I Another Place ➔

Name of Place (if any)

Street Address

City State Zip

& Nearest Cross Streets

WHAT did you do here? *(Check all that apply)*

- ❑ Drop-off/ pick-up someone
- ❑ Visit friends/ relatives
- ❑ Eat meals
- ❑ Social/recreational/entertainment
- ❑ Shop
- ❑ Doctor/dentist/other professional
- ❑ Other family or personal business
- ❑ Religious or civic
- ❑ Other activities not-at-home (Specify):
- ❑ Work at home (job related)
- ❑ Work at regular jobsite
- ❑ Work activity at other place
- ❑ School at regular place
- ❑ School activity at other place
- ❑ Sleep
- ❑ Other activities at home

rom Place #1, did you o to another place uring your 24-hour ay?

NO- You stayed in one place all 24 hours.

Check here: ❑ **DONE**

YES- At what time did you leave Place #1 to go to Place #2?

: am/pm

NEXT PLACE #2

Place # 2

❑ My Home
❑ My Regular Workplace
❑ My School
❑ Other Place (address already provided)
❑ A New Place ➔

Name of Place (if any)
Street Address
City State Zip
& Nearest Cross Streets

At WHAT TIME did you ARRIVE at Place #2?

: am/pm

HOW did you get from Place #1 to Place #2?

Show ALL the methods of travel you used to make this trip.

1st → 2nd → 3rd → 4th → 5th

If you used TRANSIT (Bus, Rail, Subway, Ferry, Other)

Line #/ Service	Station Name (if Rail or Subway)
First board:	at:
1st transfer:	at:
2nd transfer:	at:
Last Station	at:

WHAT did you do at Place # 2? *(Check all that apply)*

❑ Drop-off/ pick-up someone
❑ Visit friends/ relatives
❑ Eat meals
❑ Social/recreational/entertainment
❑ Shop
❑ Doctor/dentist/other professional
❑ Other family or personal business
❑ Religious or civic
❑ Other activities not-at-home (Specify):
❑ Work at home (job related)
❑ Work at regular jobsite
❑ Work activity at other place
❑ School at regular place
❑ School activity at other place
❑ Sleep
❑ Other activities at home

From Place #2 did you go to another place during your 24-hour day?

NO- This was your LAST place for the 24-hour day.

Check here: ❑ **DONE**

YES- At what time did you leave Place #2 to go to Place #3?

: am/pm

NEXT PLACE #3

Place # 3

❑ My Home
❑ My Regular Workplace
❑ My School
❑ Other Place (address already provided)
❑ A New Place ➔

Name of Place (if any)
Street Address
City State Zip
& Nearest Cross Streets

At WHAT TIME did you ARRIVE at Place #3?

: am/pm

HOW did you get from Place #2 to Place #3?

Show ALL the methods of travel you used to make this trip.

1st → 2nd → 3rd → 4th → 5th

If you used TRANSIT (Bus, Rail, Subway, Ferry, Other)

Line #/ Service	Station Name (if Rail or Subway)
First board:	at:
1st transfer:	at:
2nd transfer:	at:
Last Station	at:

WHAT did you do at Place # 3? *(Check all that apply)*

❑ Drop-off/ pick-up someone
❑ Visit friends/ relatives
❑ Eat meals
❑ Social/recreational/entertainment
❑ Shop
❑ Doctor/dentist/other professional
❑ Other family or personal business
❑ Religious or civic
❑ Other activities not-at-home (Specify):
❑ Work at home (job related)
❑ Work at regular jobsite
❑ Work activity at other place
❑ School at regular place
❑ School activity at other place
❑ Sleep
❑ Other activities at home

From Place #3 did you go to another place during your 24-hour day?

NO- This was your LAST place for the 24-hour day.

Check here: ❑ **DONE**

YES- At what time did you leave Place #3 to go to Place #4?

: am/pm

NEXT PLACE #4

Appendix D – Retrieval Interview

Interview Completion Form for Project # 962011

This form must be completed and attached to the front of each completed survey. For a retrieval survey to be considered complete, you are required to verify each of the following items carefully. By initialing each item, you are certifying that you did the indicated task and that it is correct.

1. Does the # of people in the household equal the # you have data for? _____

2. Is the income level of the household indicated on the label or Q5 of the retrieval form? If not, did you ask for it? _____

3. Did you verify the demographic data? _____

4. Did you verify the vehicle information? _____

5. If the household members did not travel anywhere on their assigned travel day, please explain why on the lines below. _____
   Person#____ Why?_____
   Person#____ Why?_____
   Person#____ Why?_____
   Person#____ Why?_____

6. If a person did not have any work or school trips, please explain. _____
   Person#____ Why?_____
   Person#____ Why?_____
   Person#____ Why?_____
   Person#____ Why?_____

7a. If there are any shared/linked trips (for example: husband and wife going to the same location), are the complete addresses recorded in each trip's address blocks? _____
7b. Did both or all household members report each shared trip? _____

8. Does every trip for each household member have the best possible place name and address that you could obtain from the respondent? _____

9. Did each person return home on the last trip? If not, why not? _____
   Person#____ Why?_____
   Person#____ Why?_____
   Person#____ Why?_____
   Person#____ Why?_____

10. Is your writing throughout the survey legible enough that our data entry staff will be able to enter all of the information on your survey? _____

11. Does it appear that you have appropriately circled responses, on each of the items that you were required to retrieve, for each respondent _____

For verification purposes, retrieval surveys must be "spot-checked" by a supervisor and at least 3 of the items above randomly selected for verification. Supervisors must place their initials next to the items verified. Supervisors must also sign this form to certify that they verified the items above and consider this survey to be a valid complete.

Supervisor Signature: _____ Date: _____

Quest.#: «QUEST» Sample Number: «SAMPN» Telephone #: «S_TEL» Preferred time: «Q131»

Section A

Hello, my name is [YOUR NAME] and I'm calling on behalf of the Transportation Futures Project sponsored by New York Metropolitan Transportation Council about the survey your household recently completed. May I please speak with «RESPFNAME» «RESPLNAME» ?

«Respfname» «RESPLNAME»
«ADDRESS»
«CITY», «STATE» «ZIP1»
Travel Day: «tday» Assignment #: «ASSIN»

[IF RESPONDENT NOT AVAILABLE, FILL UP CALL BACK INFO]
[IF RESPONDENT IS AVAILABLE ASK THE FOLLOWING QUESTIONS]

First I need to verify some information about your household, then I will begin collecting the activity information from the diaries we sent for each household member.

HOUSEHOLD MEMBER VERIFICATION

***Q1.** When we interviewed your household last week, we were told that there were «MLIVE» persons in your household and that their names and ages were:

«FNAME1»	«AGE1»	«GENDER1»	«FNAME4»	«AGE4»	«GENDER4»
«FNAME2»	«AGE2»	«GENDER2»	«FNAME5»	«AGE5»	«GENDER5»
«FNAME3»	«AGE3»	«GENDER3»	«FNAME6»	«AGE6»	«GENDER6»

Is this information correct? Yes [skip to Q2] No [ask: What corrections should I make?] [MAKE CORRECTIONS]

***Q2.** How many commercial vehicles arrived at your home to deliver packages, perform repairs, or provide other services during your assigned travel day (Exclude mailman)? _____

***Q3.** How many out-of-town visitors stayed at this residence during the travel day? _____

HOUSEHOLD VEHICLE INFORMATION

***Q4.** I show that your household has vehicles available for use including the following makes and models [READ/VERIFY THE YEAR, MAKE AND BODY TYPES ON THE LABEL -IF DK/RF OR OTHER IS SHOWN TRY TO OBTAIN IT]

«VHYR1» «VHTYP1»
«VHYR2» «VHTYP2»
«VHYR3» «VHTYP3»
«VHYR4» «VHTYP4»
«VHYR5» «VHTYP5»

Is this information correct? Yes [skip to Q5] No [ask: What corrections should I make?] [MAKE CORRECTIONS]

INCOME REFUSAL CONVERSION/VERIFICATION

***Q5 «ASKINC»** And the last piece of information I need to get is the total annual household income for last year, including all sources of combined income for the household. What would be the household income level?

[IF THEY ARE RELUCTANT TO SAY, READ:] Was it above or below $50,000? Above Below

Which range would it fall into? [Read the following categories]

[IF LESS THAT $50,000]		[IF MORE THAN $50,000]	
1	Less than $10,000	6	$50,000 to less than $75,000
2	$10,000 to less than $15,000	7	$75,000 to less than $100,000
3	$15,000 to less than $25,000	8	$100,000 to less than $125,000
4	$25,000 to less than $35,000	9	$125,000 to less than $150,000
5	$35,000 to less than $50,000	10	$150,000 or more
		98	[DON'T READ] Don't Know
		99	[DON'T READ] Refused

*Q6 Great, now I would like to collect the trip/activity information that your household recorded for _____. Let's begin with your information. Do you have your travel diaries handy?

[NEXT, BEGIN WITH THE FOLLOWING RETRIEVAL FORM AND COLLECT EACH ACTIVITY FOR EACH PERSON]

RESULT CODES

Eligibility Unknown	Eligible	Ineligible
1- No Answer	20- Completed	7- Disconnected
2- Busy	13- Partial Complete	8- Deaf/Language
3- Answering Machine	12- 2nd Refusal	9- Business/Govt
4- Call Back -respondent not reached		10- Computer/Fax
5- Call Back - specific		
6- First Refusal		

HOUSEHOLD CONTACT RECORD

Attempt	Date	Time	Int#/Initial	Result	Contact Notes
1					
2					
3					
4					

5					
6					

Sample No: _____

Person No: _____

Person Name: _____

Interviewed in Person 1.Yes 2.No ==> Complete PROXY ===>

PROXY Reporting

Did Person Use the Diary? 1.Yes 2.No

Who reported the data? Name _____

How many places did you visit during your diary day? _____

Person No. _____

[INTERVIEWER NOTE: DO NOT END INTERVIEW UNTIL ALL PLACES HAVE BEEN ACCOUNTED FOR]

Place 1

1. Where were you at 3:00 AM?

1 My Home
2 My Regular Workplace
3 My School
4 Another Place (Specify Below)

IF RESPONSE IS NOT HOME, CONFIRM LOCATION:
At 3:00 AM, you were at:
Place Name:
_____
Address:
_____
Nearest Cross-Street: _____
City: _____
County: _____
Zipcode: _____

2. What did you do here? (check all that apply)

1 Drop off/pick up someone
2 Visit friends/relatives
3 Eat meals
4 Social/recreation/entertainment
5 Shop
6 Doctor/dentist/other professional
7 Other family or personal business
8 Religious or civic
9 Work at home (job related)
10 Work at regular jobsite
11 Work activity at other place
12 School at regular place
13 School activity at other place
14 Sleep
15 Other activities at home
16 Other activities not-at-home (Specify):_____

(Double Check For Inconsistent Activities)

At what time did you leave place #1?: _____ am/pm

If did not leave home all day, ask
"This means you were home all day. Is that correct?"
Yes: ASK No: Continue unto new page
Did you go to work/school? If NO, explain

If OUT OF TOWN:
Where (City, State)
Did you stay at a (circle one)
Residence Hotel/Motel School Other _____

At what time did you leave this place?: _____ am/pm

Place #: _____

Time of Arrival: _____ am/pm

Did you make any stops along the way 1.Yes 2.No If YES: Insert new place

1. What type of place did you go to next?	**2. What did you do here?**	**3. How did you get here?**	**AUTO**	**If Auto Driver:**	**If TRANSIT (ANY):**	**If TRANSIT (ANY):**
1 My Home	1 Drop off/pick up someone	Please tell me in the order	4 Did you use any of your	8 If drove to destination, where did you park?	Is TRAIN = 1. Subway 2. Commuter Rail	**15. Payment Information:**
2 My Regular Workplace	2 Visit friends/relatives	of methods of travel used.	HH vehicles to get here?	1.Street 2.Garage 3.Parking Lot 4.Other _____	Is BUS = 3. Local 4. Express	A.1st Payment:How did you pay your fare?
3 My School	3 Eat meals	1)	1. Yes 2. No	COST: $_____ per 1.hour 2.day 3.week 4.month	12. Where did you board?	1.Cash 2.Token 3.Weekly Pass 4. Monthly Pass .Metrocard
4 Other Place - Already provided address	4 Social/recreation/entertainment		IF YES: Veh No.	5.Other (specify)	Station name: _____	6.Other _____
Habitual Address Code?	5 Shop	2)	5 Were you the 1. driver	9 Did you pay any toll?	Line #/ Service: _____	B.2nd Payment:How did you pay your fare?
5 A New Place (Specify Below)	6 Doctor/dentist/other professional		or 2. passenger	1. Yes 2. No	13. How many times did you transfer?	1.Cash 2.Token 3.Weekly Pass 4. Monthly Pass .Metrocard
(If other):What is name & address of the place?	7 Other family/personal business	3)	**FOR ALL TRIPS**	If yes, how much? $_____	0 1 2 3 4 5 > 5	6.Other _____
Place Name: _____	8 Religious or civic		6 How many people were	# Did you drop off or pick up	Line #/Service/Route Station	C.3rd Payment:How did you pay your fare?
Address: _____	9 Work at home (job related)	4)	traveling together, including	anyone? 1.Yes 2. No	1st transfer: _____	1.Cash 2.Token 3.Weekly Pass 4. Monthly Pass .Metrocard
Nearest Cross-Street: _____	1 Work at regular jobsite 0		yourself? _____	Was it a HH member? 1.Yes 2.No	2nd transfer: _____	6.Other _____
City: _____	1 Work activity at other place 1	5)	7 Of those, # HH: ____	If yes: which HH member(s)?	3rd transfer: _____	D.4th Payment:How did you pay your fare?
County/Borough: _____	1 School at regular place 2		Who? (Person #): _____		4th transfer: _____	1.Cash 2.Token 3.Weekly Pass 4. Monthly Pass .Metrocard
State: _____	1 School activity at other place 3	6)	_____	**If Auto Passenger:**	5th transfer _____	6.Other _____
Zipcode: _____	1 Sleep 4		_____	# Were you dropped off or picked up? 1.Yes 2.No By a HH member? 1.Yes 2.No	14. At which station did you exit? Station name: _____	E.5th Payment:How did you pay your fare?
	1 Other activities at home 5	NOTE: If CAB is used, you must indicate GYPSY, BLACK, OR YELLOW	# non-HH: _____			1.Cash 2.Token 3.Weekly Pass 4. Monthly Pass .Metrocard
	1 Other (Specify): 6 _____			If yes, who?		6.Other _____

(Double Check For Inconsistent Activities)

At what time did you leave this place?: _____ am/pm

Appendix E – Edit Check Program Detail

The edit check program developed by Parsons Brinckerhoff for use with the HIS data set is the most ambitious and comprehensive edit check program developed to date. The edit check program itself is written in FORTRAN, and used SPSS files as the main data input. The program checks for valid ranges and logical consistency both within and across the five data sets that comprise the HIS data set. These checks include the following:

All Files:
Verify that the values for each data item are valid (i.e., within the required range).

Household File
Number of vehicles indicated matches the number reported in the vehicle file.
Number of household members indicated matches the number reported in the person file.
Number of places indicated matches the number reported in the trip file.
Household location identifier is contained in the location file.

Person File
Person records exist for each household.
There are no person records for sample numbers that don't appear in the household file.
Number of places indicated matches the number reported in the trip file.
If student had no school activity on travel day, reason must be provided.
If worker has no work activity on travel day, reason must be provided.
If person has no travel on travel day, reason must be provided.
All reported locations exist in location file.

Vehicle File
Vehicle records exist for each household reporting at least one vehicle.
There are no vehicle records for sample numbers that don't appear in the household file.
Verify vehicles with model years before 1960.

Trip File
Records exist for all completed households.
There are no trip records for sample numbers that don't appear in the household file.
Travel mode is reported for all new places.
Place numbers are sequential and inclusive.
Travel times verified such that arrival time at place (n) must be before departure from place (n) AND arrival time at place (n+1) must be after departure from place (n)
Consistency between reported travel among household members for travel times, location, party size, and travel modes.
Consistency in reports of dropping off or picking up household members.
If reported location is HOME, activity must be a home activity.
If reported location is HOME, location number must match location number in household file.
If activity is WORK, reported location must be WORK (unless its verified that person works at home).
If activity is WORK, reported location must match work1 or work2 location in person file.
If activity is SCHOOL, reported location must match school location in person file.
If last location is not HOME, flag to confirm trips are not missing.

If reported mode is AUTO, all auto-related variables must be completed.
If reported mode is TRANSIT, all transit-related variables must be completed.
All reported locations exist in the location file.
Calculated distance and travel time for each mode must be consistent with specified maximum and minimum speeds.

Location File
All locations must have a geocode coordinate, census tract, and fips code.

The edit check program consists of three files: SPSS syntax to process and recode input files; control file to point to file locations, and executable program. The process for implementing the edit check program consists of five steps, as outlined below.

1. **File Management System**. The edit check program resides on the network, in a project specific sub-directory. An additional location is provided for the recoded files to ensure the edit check program uses the correct files.
2. **Prepare Deliverable Data Files.** The data files were prepared using the NuStats Continuous Data Flow program. All households identified as having complete travel information were included in the edit check process.
3. **Run SPSS Recode Syntax.** In order to execute PB's edit check program, the data must be recoded and exported as ASCII data. The SPSS syntax program performs the necessary data processing and exports the recoded files to the specified directory. Any warning messages that appear during the recoding could indicate that the data were improperly formatted. In the event this occurs, these must be addressed prior to executing the edit check program.
4. **Run Edit Check Program.** Once the recoded, ASCII formatted data files have been prepared, the edit check program can be executed. As the program runs, it will report the stage of data processing. The user is prompted to enter the maximum assignment number for households being edited. If no execution errors occur, the program will terminate normally and produce at least eight output files (depending on the number of output messages). These include:

List.out	program listing, which reports the contents of the control file and the contents of the household report file(s).
Hhfile01.rpt	Report file(s) containing output messages for all household data (i.e., household, person, vehicle, and trip/activity file discrepancies).
Loc.rpt	Report file containing output messages for location file data.
Auto.rpt	Report file containing speed check warning messages for auto trips.
Bike.rpt	Report file containing speed check warning messages for bike trips.
Rail.rpt	Report file containing speed check warning messages for rail trips.
Tran.rpt	Report file containing speed check warning messages for transit trips.
Walk.rpt	Report file containing speed check warning messages for walk trips.

5. **Edit and Clean Data**. The output files are imported into excel, combined, and assigned for editing and cleaning. Corrections are made directly into the master SPSS data files.

Once cleaning and editing is complete, the process is repeated until no error messages remain. Warning messages will remain, as they provide guidance to modelers in the use of the data.

Appendix F – Travel Days

Each household that agreed to participate in the project was assigned a specific day for recording their travel. The list below shows the specific days for which 11,264 households recorded their travel on this project. The information is listed in three columns:

- Assignment Number –the code that links the recorded data to the diary day.
- Travel Day –the calendar day on which travel was recorded.
- Households Reporting Data – the number of households recording travel on the travel day.

Assignment Number	Travel Day	Households Reporting Data
2	5/9/97	66
3	5/12/97	39
4	5/13/97	17
5	5/14/97	36
6	5/15/97	24
7	5/16/97	43
8	5/19/97	31
9	5/20/97	35
10	5/21/97	23
11	5/22/97	20
12	5/23/97	1
13	5/27/97	53
14	5/28/97	29
15	5/29/97	36
16	5/30/97	20
17	6/2/97	106
18	6/3/97	1
20	6/5/97	24
21	6/6/97	18
22	6/9/97	30
23	6/10/97	35
24	6/11/97	30
25	6/12/97	32
26	6/13/97	54
27	6/16/97	109
28	6/17/97	121
29	6/18/97	93
30	6/19/97	44
31	6/20/97	234
32	6/23/97	156
33	6/24/97	167
34	6/25/97	90
35	6/26/97	82
36	6/27/97	234
101	9/18/97	56
102	9/19/97	37
103	9/22/97	109

Assignment Number	Travel Day	Households Reporting Data
104	9/23/97	61
105	9/24/97	63
106	9/25/97	54
107	9/26/97	63
108	9/29/97	56
109	9/30/97	178
110	10/3/97	113
111	10/6/97	45
112	10/7/97	75
113	10/8/97	95
114	10/9/97	167
115	10/13/97	90
116	10/14/97	67
117	10/15/97	74
118	10/16/97	27
119	10/17/97	34
120	10/20/97	85
121	10/21/97	19
122	10/22/97	34
123	10/23/97	6
124	10/24/97	2
126	10/26/97	1
127	10/27/97	11
128	10/28/97	30
129	10/29/97	19
130	10/30/97	2
131	10/31/97	4
134	11/3/97	26
135	11/4/97	120
136	11/5/97	113
137	11/6/97	30
138	11/7/97	2
139	11/8/97	64
140	11/9/97	39
141	11/10/97	54
142	11/11/97	66
143	11/12/97	193
144	11/13/97	104
145	11/14/97	85
146	11/15/97	1
148	11/17/97	119
149	11/18/97	56
150	11/19/97	99
151	11/20/97	169
152	11/21/97	86
153	11/22/97	1
154	11/23/97	2
155	11/24/97	108
156	11/25/97	134
157	11/26/97	132
158	12/1/97	148
159	12/2/97	172

Assignment Number	Travel Day	Households Reporting Data
160	12/3/97	159
161	12/4/97	324
162	12/5/97	14
163	12/8/97	265
164	12/9/97	135
165	12/10/97	131
166	12/11/97	63
167	12/15/97	18
168	12/16/97	53
169	12/17/97	32
202	1/29/98	23
203	1/30/98	31
204	2/2/98	58
205	2/3/98	53
206	2/4/98	31
207	2/5/98	44
208	2/6/98	69
209	2/9/98	32
210	2/10/98	59
211	2/11/98	38
212	2/12/98	52
213	2/13/98	50
214	2/17/98	56
215	2/18/98	80
216	2/19/98	73
217	2/20/98	78
218	2/23/98	49
219	2/24/98	68
220	2/26/98	55
221	2/27/98	69
222	3/2/98	68
223	3/3/98	62
224	3/4/98	86
225	3/5/98	77
226	3/6/98	113
227	3/9/98	72
228	3/10/98	31
229	3/11/98	39
230	3/12/98	91
231	3/13/98	95
232	3/16/98	34
233	3/18/98	91
234	3/19/98	86
235	3/20/98	100
236	3/21/98	9
237	3/22/98	16
238	3/23/98	52
239	3/24/98	33
240	3/25/98	42
241	3/26/98	16
242	3/27/98	104

Assignment Number	Travel Day	Households Reporting Data
244	3/29/98	77
245	3/30/98	49
246	3/31/98	59
247	4/1/98	99
248	4/2/98	87
249	4/3/98	104
250	4/4/98	16
252	4/6/98	61
253	4/7/98	52
254	4/8/98	101
255	4/9/98	148
257	4/13/98	33
258	4/14/98	42
259	4/15/98	20
260	4/16/98	80
261	4/17/98	110
262	4/19/98	6
263	4/20/98	35
264	4/21/98	46
265	4/22/98	30
266	4/23/98	54
267	4/24/98	205
268	4/25/98	36
269	4/26/98	2
270	5/8/98	55
271	5/4/98	47
272	5/5/98	7
273	5/6/98	18
274	5/7/98	23
275	5/11/98	14
276	5/12/98	5
277	5/13/98	5
278	5/14/98	2
300	5/29/98	1

Appendix G – Statistical Reliability

The purpose of this appendix is to document the statistically significant ranges of specific survey results at the regional (95% confidence interval) and county (90% confidence interval) levels.

For purposes of the regional analysis, the data were divided into two groups: NY and NJ regions. The NJ region is comprised of all NJ households. The NY region is comprised of the NY and CT households. The county analysis relies on the county of residence. All analyses were conducted using unweighted data. All tables show the sampling error associated with the survey results. The variables included in this analysis were:

1. Household income (region and county) [Household file]
2. Household size (region and county) [Household file]
3. Travel mode to work (region and county) [Place file]
4. Travel time to work (region and county) [Place file]
5. Household vehicles (region and county) [Household file]
6. Total reported household trips (region and county) [Household file]
7. Number of work trips to Manhattan vs. non-Manhattan location (region and county) [Place file]

For **categorical** variables (household income, travel mode to work, and work location), binomial distributions were created in order to calculate the associated sampling errors. The sampling error for each binomial distribution is expressed as a percentage. In all cases, the sampling errors were manually calculated based upon the sample sizes and proportions within the respective binomial distributions. The binomial distribution for household income (set at the levels of under $50k and $50k+) was chosen based on a calculation of the mean category. In the case of travel mode to work, the distribution divides the modes into auto and non-auto travel. Work location was specified as Manhattan vs. non-Manhattan in the NJTPA instructions for preparing this memo.

For **continuous** variables (household size, travel time to work, household vehicles, and total household trips), the sampling error was calculated based on the unweighted mean. The corresponding tables in this memo reflect sample size, mean, sampling error, and confidence intervals for each variable.

The following is a summary of the results of the statistical analysis, both for the regional and county levels.

Table 1
Sampling Error of Household Income at the Regional Level (95% confidence level)

	Region	N	< $50k	$50k+	Sampling Error
	New York	4591	48.9%	51.1%	+/- 1.45%
	New Jersey	3691	44.4%	55.6%	+/- 1.60%

Base: All weekday households reporting income, unweighted.
Based on binomial distribution of incomes (<$50k and $50k+), expressed in percentages.
Note: The confidence interval is calculated by adding and subtracting the sampling error to the distribution.

Table 2
Sampling Error of Household Income at the County Level (90% confidence level)

FIPS Code	County	N	< $50k	$50k+	Sampling Error
9001	Fairfield, CT	192	34.4%	65.6%	+/- 5.66%
9009	New Haven, CT	136	50.0%	50.0%	+/- 7.07%
34003	Bergen, NJ	479	39.5%	60.5%	+/- 3.69%
34013	Essex, NJ	312	55.4%	44.6%	+/- 4.64%
34017	Hudson, NJ	354	62.4%	37.6%	+/- 4.25%
34019	Hunterdon, NJ	198	26.8%	73.2%	+/- 5.19%
34021	Mercer, NJ	313	40.6%	59.4%	+/- 4.58%
34023	Middlesex, NJ	294	46.6%	53.4%	+/- 4.80%
34025	Monmouth, NJ	319	42.9%	57.1%	+/- 4.57%
34027	Morris, NJ	223	28.7%	71.3%	+/- 5.00%
34029	Ocean, NJ	191	52.4%	47.6%	+/- 5.96%
34031	Passaic, NJ	207	57.5%	42.5%	+/- 5.67%
34035	Somerset, NJ	194	32.5%	67.5%	+/- 5.55%
34037	Sussex, NJ	214	37.9%	62.1%	+/- 5.47%
34039	Union, NJ	187	42.8%	57.2%	+/- 5.97%
34041	Warren, NJ	206	45.6%	54.4%	+/- 5.73%
36005	Bronx, NY	215	77.2%	22.8%	+/- 4.72%
36027	Dutchess, NY	211	45.0%	55.0%	+/- 5.65%
36047	Kings, NY	378	69.6%	30.4%	+/- 3.90%
36059	Nassau, NY	280	39.6%	60.4%	+/- 4.82%
36061	New York, NY	1195	48.0%	52.0%	+/- 2.38%
36071	Orange, NY	200	48.0%	52.0%	+/- 5.83%
36079	Putnam, NY	182	40.1%	59.9%	+/- 5.99%
36081	Queens, NY	217	65.4%	34.6%	+/- 5.33%
36085	Richmond, NY	638	49.2%	50.8%	+/- 3.27%
36087	Rockland, NY	173	38.2%	61.8%	+/- 6.10%
36103	Suffolk, NY	324	37.7%	62.3%	+/- 4.44%
36119	Westchester, NY	250	35.6%	64.4%	+/- 5.00%

Base: All weekday households reporting income, unweighted.
Based on binomial distribution of incomes (<$50k and $50k+), expressed in percentages.
Note: The confidence interval is calculated by adding and subtracting the sampling error to the distribution.

Table 3
Sampling Error of Household Size at the Regional Level (95% confidence level)

Region	N	Mean	Confidence Level Factor	Standard Error of the Mean	Sampling Error	Confidence Interval	
						Lower Bound	Upper Bound
New York	6021	2.37	1.96	0.0173	+/- 1.34	2.34	2.41
New Jersey	4950	2.50	1.96	0.0188	+/- 1.32	2.46	2.53

Base: All weekday households, unweighted.
Note: The confidence interval is calculated by first multiplying the standard error of the mean by the confidence level factor to determine the sampling error, then adding and subtracting the sampling error to the mean.

Table 4
Sampling Error of Household Size at the County Level (90% confidence level)

FIPS Code	County	N	Mean	Confidence Level Factor	Standard Error of the Mean	Sampling Error	Confidence Interval	
							Lower Bound	Upper Bound
9001	Fairfield, CT	270	2.41	1.645	0.0762	+/- 0.12	2.29	2.53
9009	New Haven, CT	160	2.16	1.645	0.0912	+/- 0.15	2.01	2.31
34003	Bergen, NJ	643	2.45	1.645	0.0504	+/-0.09	2.36	2.53
34013	Essex, NJ	418	2.50	1.645	0.0699	+/-0.11	2.39	2.62
34017	Hudson, NJ	489	2.32	1.645	0.0598	+/-0.10	2.22	2.42
34019	Hunterdon, NJ	276	2.72	1.645	0.0758	+/-.012	2.59	2.84
34021	Mercer, NJ	409	2.43	1.645	0.0627	+/-0.11	2.32	2.53
34023	Middlesex, NJ	376	2.50	1.645	0.0651	+/-0.11	2.39	2.61
34025	Monmouth, NJ	433	2.51	1.645	0.0662	+/-0.11	2.40	2.62
34027	Morris, NJ	288	2.62	1.645	0.0837	+/-0.14	2.48	2.76
34029	Ocean, NJ	269	2.39	1.645	0.0828	+/-0.13	2.26	2.53
34031	Passaic, NJ	275	2.44	1.645	0.0821	+/-0.14	2.30	2.57
34035	Somerset, NJ	266	2.48	1.645	0.0757	+/-0.12	2.36	2.61
34037	Sussex, NJ	277	2.71	1.645	0.0761	+/-0.12	2.59	2.84
34039	Union, NJ	260	2.51	1.645	0.0813	+/-0.14	2.38	2.65
34041	Warren, NJ	271	2.61	1.645	0.0764	+/-0.13	2.48	2.73
36005	Bronx, NY	271	2.45	1.645	0.0850	+/-0.14	2.31	2.59
36027	Dutchess, NY	275	2.57	1.645	0.0776	+/-0.13	2.44	2.70
3604	Kings, NY	489	2.65	1.645	0.0682	+/-0.12	2.53	2.76

7								
36059	Nassau, NY	384	2.55	1.645	0.0703	+/-0.12	2.44	2.67
36061	New York, NY	1548	1.80	1.645	0.0273	+/-0.05	1.75	1.84
36071	Orange, NY	270	2.75	1.645	0.0867	+/-0.15	2.61	2.90
36079	Putnam, NY	261	2.65	1.645	0.0842	+/-0.14	2.51	2.79
36081	Queens, NY	276	2.49	1.645	0.0833	+/-0.14	2.35	2.63
36085	Richmond, NY	813	2.55	1.645	0.0458	+/-0.08	2.48	2.63
36087	Rockland, NY	250	2.76	1.645	0.0886	+/-0.15	2.61	2.90
36103	Suffolk, NY	432	2.74	1.645	0.0663	+/-0.11	2.63	2.85
36119	Westchester, NY	322	2.45	1.645	0.0729	+/-0.12	2.33	2.57

Base: All weekday households, unweighted.

Note: The confidence interval is calculated by first multiplying the standard error of the mean by the confidence level factor to determine the sampling error, then adding and subtracting the sampling error to the mean.

Table 5
Sampling Error of Work Travel Modes at the Regional Level (95% confidence level)

	Region	N	Auto	Non-Auto	Sampling Error
	New York	4781	55.6%	44.4%	+/- 1.42%
	New Jersey	3860	85.5%	14.5%	+/- 1.12%

Base: All weekday trips with work trip purpose, unweighted.
Based on binomial distribution of travel modes (auto vs. non-auto) expressed in percentages.
Note: The confidence interval is calculated by adding and subtracting the sampling error to the distribution.

Table 6
Sampling Error of Work Travel Modes at the County Level (90% confidence level)

FIPS Code	County	N	Auto	Non-Auto	Sampling Error
9001	Fairfield, CT	182	85.7%	14.3%	+/- 5.08%
9009	New Haven, CT	112	95.5%	4.5%	+/- 3.82%
34003	Bergen, NJ	511	80.8%	19.2%	+/- 3.41%
34013	Essex, NJ	291	75.6%	24.4%	+/- 4.93%
34017	Hudson, NJ	295	54.9%	45.1%	+/- 5.68%
34019	Hunterdon, NJ	230	91.7%	8.3%	+/- 3.56%
34021	Mercer, NJ	305	89.2%	10.8%	+/- 3.49%
34023	Middlesex, NJ	330	86.7%	13.3%	+/- 3.67%
34025	Monmouth, NJ	321	86.6%	13.4%	+/- 3.73%
34027	Morris, NJ	295	91.5%	8.5%	+/- 3.18%
34029	Ocean, NJ	171	92.4%	7.6%	+/- 3.97%
34031	Passaic, NJ	185	88.6%	11.4%	+/- 4.57%
34035	Somerset, NJ	193	95.3%	4.7%	+/- 2.97%
34037	Sussex, NJ	217	98.6%	1.4%	+/- 1.55%
34039	Union, NJ	207	82.6%	17.4%	+/- 5.16%
34041	Warren, NJ	255	98.8%	1.2%	+/- 1.32%
36005	Bronx, NY	191	35.6%	64.4%	+/- 6.79%
36027	Dutchess, NY	217	92.2%	7.8%	+/- 3.58%
36047	Kings, NY	395	30.1%	69.9%	+/- 4.52%
36059	Nassau, NY	352	74.1%	25.9%	+/- 4.57%
36061	New York, NY	1068	7.8%	92.2%	+/- 1.61%
36071	Orange, NY	228	86.8%	13.2%	+/- 4.39%
36079	Putnam, NY	178	85.4%	14.6%	+/- 5.19%
36081	Queens, NY	235	41.3%	58.7%	+/- 6.29%
36085	Richmond, NY	581	62.5%	37.5%	+/- 3.94%
36087	Rockland, NY	219	88.1%	11.9%	+/- 4.28%
36103	Suffolk, NY	446	90.8%	9.2%	+/- 2.68%
36119	Westchester, NY	300	71.0%	29.0%	+/- 5.13%

Base: All weekday trips with work trip purpose, unweighted.
Based on binomial distribution of travel modes (auto vs. non-auto) expressed in percentages.
Note: The confidence interval is calculated by adding and subtracting the sampling error to the distribution.

Table 7
Sampling Error of Travel Time to Work at the Regional Level (95% confidence level)

Region	N	Mean	Confidence Level Factor	Standard Error of the Mean	Sampling Error	Confidence Interval	
						Lower Bound	Upper Bound
New York	4781	31.97	1.96	0.49	+/- 0.96	31.02	32.92
New Jersey	3860	28.93	1.96	0.55	+/- 1.08	27.86	30.00

Base: All weekday trips with a work trip purpose, unweighted.
Note: The confidence interval is calculated by first multiplying the standard error of the mean by the confidence level factor to determine the sampling error, then adding and subtracting the sampling error to the mean.

Table 8
Sampling Error of Travel Time to Work at the County Level (90% confidence level)

FIPS Code	County	N	Mean	Confidence Level Factor	Standard Error of the Mean	Sampling Error	Confidence Interval	
							Lower Bound	Upper Bound
9001	Fairfield, CT	183	23.88	1.645	1.79	+/- 2.94	20.93	26.84
9009	New Haven, CT	112	20.88	1.645	1.96	+/- 3.22	17.63	24.14
34003	Bergen, NJ	514	25.79	1.645	0.98	+/- 1.61	24.18	27.40
34013	Essex, NJ	293	30.43	1.645	3.13	+/- 5.15	25.26	35.60
34017	Hudson, NJ	302	30.60	1.645	1.67	+/- 2.75	27.85	33.35
34019	Hunterdon, NJ	230	30.51	1.645	2.58	+/- 4.24	26.25	34.78
34021	Mercer, NJ	310	25.09	1.645	1.39	+/- 2.29	22.80	27.37
34023	Middlesex, NJ	337	28.66	1.645	1.53	+/- 2.52	26.14	31.18
34025	Monmouth, NJ	328	32.38	1.645	1.89	+/- 3.11	29.26	35.49
34027	Morris, NJ	296	27.81	1.645	1.64	+/- 2.70	25.11	30.52
34029	Ocean, NJ	174	29.46	1.645	2.42	+/- 3.98	25.45	33.46
34031	Passaic, NJ	187	26.99	1.645	1.62	+/- 2.66	24.32	29.66
34035	Somerset, NJ	195	24.02	1.645	1.36	+/- 2.24	21.77	26.26
34037	Sussex, NJ	220	31.04	1.645	2.26	+/- 3.72	27.30	34.77
34039	Union, NJ	212	31.13	1.645	4.05	+/- 6.66	24.43	37.82
34041	Warren, NJ	262	33.24	1.645	2.22	+/- 3.65	29.57	36.90
36005	Bronx, NY	197	40.45	1.645	2.06	+/- 3.39	37.05	43.85
36027	Dutchess, NY	220	24.44	1.645	1.83	+/- 3.01	21.42	27.46
36047	Kings, NY	405	41.74	1.645	1.49	+/- 2.45	39.27	44.20

36059	Nassau, NY	358	34.94	1.645	2.40	+/- 3.95	30.97	38.90
36061	New York, NY	1078	27.38	1.645	0.94	+/- 1.55	25.84	28.92
36071	Orange, NY	230	28.14	1.645	2.05	+/- 3.37	24.76	31.52
36079	Putnam, NY	181	38.71	1.645	2.82	+/- 4.64	34.05	43.38
36081	Queens, NY	237	38.59	1.645	2.07	+/- 3.41	35.18	42.00
36085	Richmond, NY	595	37.07	1.645	1.25	+/- 2.06	35.01	39.14
36087	Rockland, NY	223	30.74	1.645	2.39	+/- 3.93	26.80	34.69
36103	Suffolk, NY	457	28.41	1.645	1.34	+/- 2.20	26.21	30.62
36119	Westchester, NY	305	31.10	1.645	2.76	+/- 4.54	26.55	35.65

Base: All weekday trips with a work trip purpose, unweighted.
Note: The confidence interval is calculated by first multiplying the standard error of the mean by the confidence level factor to determine the sampling error, then adding and subtracting the sampling error to the mean.

Table 9
Sampling Error of Household Vehicles at the Regional Level (95% confidence level)

Region	N	Mean	Confidence Level Factor	Standard Error of the Mean	Sampling Error	Confidence Interval	
						Lower Bound	Upper Bound
New York	6021	1.31	1.96	0.0154	+/- 0.03	1.28	1.34
New Jersey	4950	1.84	1.96	0.0163	+/- 0.03	1.81	1.87

Base: All weekday households, unweighted.
Note: The confidence interval is calculated by first multiplying the standard error of the mean by the confidence level factor to determine the sampling error, then adding and subtracting the sampling error to the mean.

Table 10
Sampling Error of Household Vehicles at the County Level (90% confidence level)

FIPS Code	County	N	Mean	Confidence Level Factor	Standard Error of the Mean	Sampling Error	Confidence Interval	
							Lower Bound	Upper Bound
9001	Fairfield, CT	270	2.04	1.645	0.0706	+/- 0.12	1.92	2.15
9009	New Haven, CT	160	1.78	1.645	0.0735	+/- 0.12	1.66	1.90
34003	Bergen, NJ	643	1.83	1.645	0.0445	+/- 0.07	1.75	1.90
34013	Essex, NJ	418	1.44	1.645	0.0536	+/- 0.08	1.35	1.53
34017	Hudson, NJ	489	1.15	1.645	0.0440	+/- 0.07	1.08	1.22
34019	Hunterdon, NJ	276	2.41	1.645	0.0678	+/- 0.12	2.30	2.52
34021	Mercer, NJ	409	1.86	1.645	0.0531	+/- 0.08	1.77	1.95
34023	Middlesex, NJ	376	1.86	1.645	0.0544	+/- 0.08	1.77	1.95
34025	Monmouth, NJ	433	1.91	1.645	0.0526	+/- 0.08	1.82	1.99
34027	Morris, NJ	288	2.11	1.645	0.0643	+/- 0.10	2.00	2.21
34029	Ocean, NJ	269	1.89	1.645	0.0815	+/- 0.13	1.75	2.02
34031	Passaic, NJ	275	1.73	1.645	0.0606	+/- 0.10	1.63	1.83
34035	Somerset, NJ	266	2.03	1.645	0.0656	+/- 0.12	1.92	2.14
34037	Sussex, NJ	277	2.26	1.645	0.0725	+/- 0.12	2.14	2.38
34039	Union, NJ	260	1.90	1.645	0.0691	+/- 0.12	1.79	2.01
34041	Warren, NJ	271	2.08	1.645	0.0673	+/- 0.12	1.97	2.19
36005	Bronx, NY	271	0.70	1.645	0.0549	+/- 0.08	0.61	0.79
36027	Dutchess, NY	275	2.08	1.645	0.0752	+/- 0.13	1.96	2.20
36047	Kings, NY	489	0.75	1.645	0.0387	+/- 0.07	0.68	0.81

36059	Nassau, NY	384	1.90	1.645	0.0530	+/- 0.08	1.81	1.99
36061	New York, NY	1548	0.38	1.645	0.0168	+/- 0.03	0.35	0.41
36071	Orange, NY	270	2.03	1.645	0.0726	+/- 0.12	1.91	2.15
36079	Putnam, NY	261	2.21	1.645	0.0762	+/- 0.13	2.09	2.34
36081	Queens, NY	276	1.03	1.645	0.0539	+/- 0.08	0.94	1.11
36085	Richmond, NY	813	1.47	1.645	0.0346	+/- 0.05	1.41	1.53
36087	Rockland, NY	250	2.07	1.645	0.0751	+/- 0.13	1.95	2.20
36103	Suffolk, NY	432	2.07	1.645	0.0520	+/- 0.08	1.99	2.16
36119	Westchester, NY	322	1.78	1.645	0.0623	+/- 0.10	1.68	1.89

Base: All weekday households, unweighted.

Note: The confidence interval is calculated by first multiplying the standard error of the mean by the confidence level factor to determine the sampling error, then adding and subtracting the sampling error to the mean.

Table 11
Sampling Error of Household Trips at the Regional Level (95% confidence level)

Region	N	Mean	Confidence Level Factor	Standard Error of the Mean	Sampling Error	Confidence Interval	
						Lower Bound	Upper Bound
New York	6021	7.81	1.96	0.0867	+/- 0.17	7.64	7.98
New Jersey	4950	8.40	1.96	0.1000	+/- 0.20	8.20	8.60

Base: All weekday households, unweighted.
Note: The confidence interval is calculated by first multiplying the standard error of the mean by the confidence level factor to determine the sampling error, then adding and subtracting the sampling error to the mean.

Table 12
Sampling Error of Household Trips at the County Level (90% confidence level)

FIPS Code	County	N	Mean	Confidence Level Factor	Standard Error of the Mean	Sampling Error	Confidence Interval	
							Lower Bound	Upper Bound
9001	Fairfield, CT	270	8.53	1.645	0.40	+/- 0.66	7.87	9.20
9009	New Haven, CT	160	7.40	1.645	0.52	+/- 0.86	6.54	8.26
34003	Bergen, NJ	643	8.72	1.645	0.30	+/- 0.49	8.22	9.21
34013	Essex, NJ	418	7.46	1.645	0.33	+/- 0.54	6.92	8.01
34017	Hudson, NJ	489	6.62	1.645	0.27	+/- 0.44	6.18	7.06
34019	Hunterdon, NJ	276	9.07	1.645	0.43	+/- 0.71	8.36	9.77
34021	Mercer, NJ	409	8.65	1.645	0.37	+/- 0.61	8.04	9.25
34023	Middlesex, NJ	376	8.36	1.645	0.35	+/- 0.58	7.78	8.94
34025	Monmouth, NJ	433	9.18	1.645	0.36	+/- 0.59	8.58	9.77
34027	Morris, NJ	288	9.44	1.645	0.48	+/- 0.79	8.66	10.23
34029	Ocean, NJ	269	7.14	1.645	0.41	+/- 0.67	6.47	7.82
34031	Passaic, NJ	275	7.85	1.645	0.45	+/- 0.74	7.12	8.59
34035	Somerset, NJ	266	9.00	1.645	0.46	+/- 0.76	8.25	9.76
34037	Sussex, NJ	277	9.35	1.645	0.44	+/- 0.72	8.63	10.08
34039	Union, NJ	260	8.98	1.645	0.46	+/- 0.76	8.23	9.73
34041	Warren, NJ	271	8.65	1.645	0.47	+/- 0.77	7.88	9.43
36005	Bronx, NY	271	6.66	1.645	0.36	+/- 0.59	6.07	7.26
36027	Dutchess, NY	275	9.28	1.645	0.44	+/- 0.72	8.56	10.01
3604	Kings, NY	489	7.07	1.645	0.28	+/- 0.46	6.60	7.53

7								
36059	Nassau, NY	384	8.86	1.645	0.36	+/- 0.59	8.27	9.45
36061	New York, NY	1548	6.19	1.645	0.13	+/- 0.21	5.98	6.40
36071	Orange, NY	270	9.66	1.645	0.50	+/- 0.82	8.83	10.49
36079	Putnam, NY	261	9.30	1.645	0.50	+/- 0.82	8.47	10.12
36081	Queens, NY	276	7.25	1.645	0.40	+/- 0.66	6.59	7.92
36085	Richmond, NY	813	7.83	1.645	0.24	+/- 0.39	7.43	8.22
36087	Rockland, NY	250	9.20	1.645	0.45	+/- 0.74	8.47	9.94
36103	Suffolk, NY	432	9.64	1.645	0.37	+/- 0.61	9.02	10.25
36119	Westchester, NY	322	8.89	1.645	0.43	+/- 0.71	8.18	9.61

Base: All weekday households, unweighted.
Note: The confidence interval is calculated by first multiplying the standard error of the mean by the confidence level factor to determine the sampling error, then adding and subtracting the sampling error to the mean.

Table 13
Sampling Error of Work Location at the Regional Level (95% confidence level)

Region	N	Manhattan	Non-Manhattan	Sampling Error
New York	4781	36.9%	63.1%	+/- 1.37%
New Jersey	3860	8.9%	91.1%	+/- 0.90%

Base: All weekday trips with work trip purpose, unweighted.
Based on binomial distribution of work location (Manhattan vs. non-Manhattan) expressed in percentages.
Note: The confidence interval is calculated by adding and subtracting the sampling error to the distribution.

Table 14
Sampling Error of Work Location at the County Level (90% confidence level)

FIPS Code	County	N	Manhattan	Non-Manhattan	Sampling Error
9001	Fairfield, CT	183	10.9%	89.1%	+/- 4.52%
9009	New Haven, CT	112	1.8%	98.2%	+/- 2.45%
34003	Bergen, NJ	514	18.7%	81.3%	+/- 3.37%
34013	Essex, NJ	293	9.2%	90.8%	+/- 3.31%
34017	Hudson, NJ	302	24.5%	75.5%	+/- 4.85%
34019	Hunterdon, NJ	230	2.6%	97.4%	+/- 2.06%
34021	Mercer, NJ	310	4.2%	95.8%	+/- 2.23%
34023	Middlesex, NJ	337	8.0%	92.0%	+/- 2.90%
34025	Monmouth, NJ	328	12.5%	87.5%	+/- 3.58%
34027	Morris, NJ	296	4.4%	95.6%	+/- 2.33%
34029	Ocean, NJ	174	57.5%	42.5%	+/- 7.35%
34031	Passaic, NJ	187	7.0%	93.0%	+/- 3.65%
34035	Somerset, NJ	195	51.3%	48.7%	+/- 7.02%
34037	Sussex, NJ	220	45.5%	54.5%	+/- 6.58%
34039	Union, NJ	212	11.8%	88.2%	+/- 4.34%
34041	Warren, NJ	262	1.5%	98.5%	+/- 1.48%
36005	Bronx, NY	197	42.6%	57.4%	+/- 6.91%
36027	Dutchess, NY	220	1.8%	98.2%	+/- 1.77%
36047	Kings, NY	405	47.4%	52.6%	+/- 4.86%
36059	Nassau, NY	358	22.9%	77.1%	+/- 4.35%
36061	New York, NY	1078	85.3%	14.7%	+/- 2.11%
36071	Orange, NY	230	7.0%	93.0%	+/- 3.29%
36079	Putnam, NY	181	8.3%	91.7%	+/- 4.02%
36081	Queens, NY	237	51.5%	48.5%	+/- 6.36%
36085	Richmond, NY	595	30.1%	69.9%	+/- 3.69%
36087	Rockland, NY	223	11.7%	88.3%	+/- 4.21%
36103	Suffolk, NY	457	6.8%	93.2%	+/- 2.31%
36119	Westchester, NY	305	23.0%	77.0%	+/- 4.72%

Base: All weekday trips with work trip purpose, unweighted.
Based on binomial distribution of work location (Manhattan vs. non-Manhattan) expressed in percentages.
Note: The confidence interval is calculated by adding and subtracting the sampling error to the distribution.

Appendix A – Advance Mailing Materials

February 3, 1997

«FIRSTNAME» «LASTNAME»
«HOUSE» «STREET» «APARTMENT»
«CITY», «STATE» «ZIP»

Dear «LASTNAME» Family:

Can traffic congestion in «COUNTY» be reduced? Can <<MODE1>> and <<MODE2>> better provide just what «COUNTY» residents need? What do we need most to make the transportation system serve you better in the future? The New York Metropolitan Transportation Council and other participating agencies are conducting the Transportation Futures Project to answer these and other important questions about the future of transportation in the New York metropolitan area. And we need your help! Only by knowing the travel needs of our residents can we make better choices about the future of transportation in our region.

Yours is one of a limited number of households in a scientifically selected sample chosen to represent all of the residents of the metropolitan area. We are asking you to help by telling us about your travel needs, the kinds of trips that you make, and the ways that you make these trips. Your help is vital to the success of the Project because your household, together with a few other families in the «ZIP» ZIP code, will provide the snapshot of travel from your neighborhood. You are essential to our being able to produce a complete and accurate picture of the region.

The way the project works is quite simple. We will ask you about the vehicles and transit services your family uses, the places you go to (working, going to school, shopping, entertainment, etc.) that could require transportation, and we will give each person in your household a diary for recording travel activities for a single day. Participating in this project is interesting because it helps you realize how important transportation is for your everyday activities. And you will know that you are helping us to understand your travel needs and choices.

The information you provide will be used only as part of a scientific sample of households to describe general travel needs. You have my promise that we will protect your privacy and that none of the information about your individual household will be used for any other purpose or provided to any other agency or business.

To complete the project, we have enlisted the help of several private companies, including Parsons Brinckerhoff, NuStats International, and Ebony Marketing Research. The survey specialists from NuStats and Ebony that will call you in the next few days to confirm your participation and to answer any questions that you might have are working strictly within our standards of privacy and confidentiality. Thank you for the 5 to 15 minutes (depending on your family size) we need.

If you have any other questions or concerns about the Project, please call Dr. Floyd Lapp, Director of the Transportation Division, New York City Department of City Planning, at (212) 442-4630. We look forward to having you join us in the Transportation Futures Project.

Sincerely,

Director

What is in it for you?

Security. We promise that your personal information will only be used as part of a group of statistics, *without your name, address or telephone number*. We will respect and protect your privacy.

Awareness. Families that participate in travel surveys become very aware of how they manage their travel and think of ways to manage their transportation time better.

Enjoyment. We will try to make your participation an enjoyable experience by making sure that the staff that talk to you on the phone are well-trained and courteous.

Satisfaction and Thanks. You will contribute to a useful study that will assist in using your tax dollars wisely.

On behalf of the many workers that are involved in this project at the research companies below, we sincerely thank you for your trust, patience, and time.

Participating Agencies:

Parsons Brinckerhoff (PB): New York City-based engineering and planning consulting firm, retained as the primary consultant for the Transportation Futures Project.

NuStats International: Texas-based research consulting company, hired as the sub-consultant for the Transportation Futures Project. With nationally-recognized expertise in the design and conduct of this type of travel survey, NuStats is responsible for survey administration and data collection.

Ebony Marketing Research: Bronx-based marketing research company, working with NuStats to provide assistance on survey administration and local knowledge.

TRANSPORTATION FUTURES PROJECT

WHAT
IT IS

HOW
YOU WERE SELECTED

WHY
YOU SHOULD PARTICIPATE

The principal sponsors of the Transportation Futures Project are public agencies responsible for transportation planning and coordination in their respective jurisdictions. They are the New York Metropolitan Transportation Commission (NYMTC) and the North Jersey Transportation Planning Authority. These agencies act in partnership with 28 other local, regional and state agencies.

What is the Transportation Futures Project?

Preparing for the future and planning the transportation needs of the 21st century require an accurate picture of how people are traveling today. To do this, we ask people

questions about their travel and then use their answers to build a regional information bank that many agencies use when making decisions about transportation.

Every 10 to 15 years, we update this data bank by conducting a regional study.

This is it.

There are many benefits of the Transportation Futures Project for you, your neighbors, and the more than 7 million families in the New York metropolitan region. For example, it will:

Pinpoint how and where highway improvements can reduce congestion

Guide the commuter railroads (Metro North, LIRR, NJTransit) in decisions to expand service

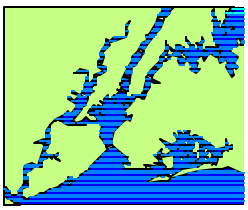
Help decide what subway stations and services need improvement

Determine where and when bus routes need to change to meet people's needs

Identify areas where bike and pedestrian friendly paths can make a nicer future

How (and Why) Your Household Was Selected

About one out of every 550 families or households in the 26 counties of New York,



New Jersey and Connecticut that make up the New York metropolitan region will be invited to participate.

The selection of these households was done by a carefully designed scientific process.

Randomly chosen telephone numbers, like yours, will be contacted by us and invited to participate in the study. Some of the phone numbers have a known or listed addresses, which allows us to contact that household by mail in advance of our phone call. Those households for which no address is available will be contacted first by phone. In either case, we depend on the goodwill of people like you to make this project a success.

You cannot be substituted.

If a selected family does not or cannot participate, we are left with gaps or blanks in the information. We cannot simply call someone else as a replacement. Because each household represents 550 other households, it is very important that you be included.

It *does not* matter if you travel a little or a lot, if you are young or old, or if you are too busy.

YOU are part of the total picture.

Appendix B – Recruitment Interview

Section 1: Introductory Script
Household will have received an advance letter.

A "Hello, my name is [NAME] with the Transportation Futures Project. A few days ago we sent a letter to your home to tell you about this very important project. It is sponsored by the New York Metropolitan Transportation Council. NYMTC is the agency responsible for planning and improving transportation in the region. Did you receive the letter?

1 YES
2 NO
8 DON'T KNOW
9 REFUSED

B As the letter (would have - *if answer to Q.A is anything other than 1*) indicated, we are doing a survey about people's travel patterns and needs. This type of study is done only once every 15 or 20 years; many agencies will use the information I am gathering to make decisions about how to improve the highway and transit systems over the next 20 years.

May I please speak with an adult?

1 HAVE RESPONDENT **Þ SKIP TO D**
2 RESPONDENT NOT AVAILABLE

C When would be a better time to call her/him?

1 YES, ARRANGE CALLBACK **Þ FILL OUT CALLBACK CARD**
2 NO, RESPONDENT NOT AVAILABLE ⇒ **TERMINATE, AUTOMATIC CALLBACK SCHEDULED**

D RESPONDENT ON LINE. I'd like to ask you a few questions. Your answers will remain completely confidential. This will take about 10 minutes. All households that participate in this study have an opportunity to win a pair of airline tickets to any continental U.S. destination. These tickets contributed by a private company, are offered as a token of our appreciation for your time.

1 OK, CONTINUE **Þ SKIP TO E**
REFUSAL:
2 HARD REFUSAL ⇒ **THANK AND TERMINATE**
3 SOFT REFUSAL ⇒ **TERMINATE, AUTOMATIC CALLBACK SCHEDULED**
4 SPECIFIC CALLBACK TIME ARRANGED **Þ FILL OUT CALLBACK CARD**
5 LANGUAGE BARRIER ⇒ **CALLED BACK BY SPECIFIC INTERVIEWER**
6 LANGUAGE BARRIER-OTHER ⇒ **CALLED BACK BY SPECIFIC INTERVIEWER**

E Have I reached you at your home?

1 YES **Þ SKIP TO G**
2 NO, I DON'T LIVE HERE
3 NO, THIS IS NOT A RESIDENCE **Þ THANK AND TERMINATE**

F Can I speak to someone who lives there?

1 YES: QUALIFIED PERSON AVAILABLE **Þ GO BACK TO A**
2 YES: QUALIFIED PERSON NOT AVAILABLE **Þ GO BACK TO B**
3 NO SUCH PERSON **Þ THANK AND TERMINATE**
4 REFUSAL **Þ THANK AND TERMINATE**

G Are you 18 or older?
1 YES Þ **SKIP TO Q1**
2 NO

H May I speak with someone in your household who is 18 or older?
1 ADULT AVAILABLE Þ **GO BACK TO A**
2 ADULT NOT HOME Þ **GO BACK TO B**
3 REFUSED Þ **THANK AND TERMINATE**

Initial questions will introduce project, promote participation, and confirm that respondent is an adult and that residence is in an eligible location.

Q1 Including all cars, trucks, vans, motorcycles and recreational vehicles, whether owned or leased or provided by an employer, how many vehicles are presently available to the members of your household?
00 ZERO Þ **SKIP TO Q6**
01 ONE
02 TWO
03 THREE
04 FOUR
05 FIVE
06 SIX
07 SEVEN
08 EIGHT
09 MORE THAN EIGHT (ENTER EXACT NUMBER _____)
98 DON'T KNOW Þ **THANK AND TERMINATE**
99 REFUSED Þ **THANK AND TERMINATE**

Now I need to get some information about your vehicle(s).

Q2 What's the year of your vehicle? IF TWO OR MORE: "What's the year of vehicle number one, that is, the one used the most", "vehicle number two" and so on.
ENTER LAST 2 DIGITS OF YEAR OF VEHICLE: 19 _____
98 DON'T KNOW
99 REFUSED

Q3 What's the body type? IF TWO OR MORE: "What's the body type of vehicle number one, that is, the one used the most", "vehicle number two" and so on.
01 AUTO SEDAN
02 AUTO 2-SEAT
03 VAN
04 RECREATIONAL VEHICLE
05 UTILITY VEHICLE
06 STATION WAGON
07 PICK-UP TRUCK
08 MOTORCYCLE
09 MOPED
10 OTHER (SPECIFY _____)
98 DON'T KNOW
99 REFUSED

Q4 Is it owned or leased by a household member, an employer, or is it a rental car?

1 HOUSEHOLD OWNED/LEASED
2 EMPLOYER PROVIDED
3 RENTAL CAR
4 BORROWED FROM FRIEND OR RELATIVE
5 OTHER
8 DON'T KNOW
9 REFUSED

Q2 to Q4 to be repeated for each vehicle, up to eight vehicles

Q5 Do you live in a ...

1 SINGLE-FAMILY HOUSE DETACHED FROM ANY OTHER HOUSE
2 SINGLE-FAMILY HOUSE ATTACHED TO ONE OR MORE HOUSES (TOWNHOUSE)
3 BUILDING WITH AT LEAST 2 APARTMENTS (SPECIFY # OF UNITS_____)
4 HOTEL/MOTEL
5 MOBILE HOME OR TRAILER
6 DORMITORY/GROUP QUARTERS/BARRACKS
7 OTHER (SPECIFY) _____
98 DON'T KNOW
99 REFUSED

Q6 What year did you move into this home?

ENTER TWO DIGITS FOR THE YEAR: 19_____
98 DON'T KNOW
99 REFUSED

Q7 Do you own or rent your home?

1 RENT
2 OWN/BUYING (PAYING OFF MORTGAGE)
3 OTHER (SPECIFY) _____
8 DON'T KNOW
9 REFUSED

Section 4: Confirm Participation and Home Address verification Questions 8A to 8F are asked after completing Question 8.

8A For this Transportation Futures Study, we need everyone in your household to write down what they do and where they go for a 24-hour period. We'll send a diary for each person. After the assigned recording time, we'll call again to collect the information.

1 WILLING TO PARTICIPATE

REFUSAL:

1 NOT INTERESTED **Þ THANK AND TERMINATE**
2 NEED TO CHECK WITH OTHER MEMBERS **Þ FILL OUT CALLBACK CARD**
3 INTRUSION OF PRIVACY **Þ THANK AND TERMINATE**
4 GOING OUT OF TOWN **Þ THANK AND TERMINATE**
5 DID NOT RECEIVE LETTER **Þ FILL OUT CALLBACK CARD**
6 TOO BUSY/ NO TIME **Þ THANK AND TERMINATE**
7 ILLNESS IN THE FAMILY **Þ THANK AND TERMINATE**
8 DON'T KNOW / REFUSED **Þ THANK AND TERMINATE**
9 OTHER_____

8B To send the diaries, I need to verify your address {*Computer shows the address*}. I have it as:
{St. Number}
{St. Direction}
{St. Name}
{St. Type}
{Apt. Number}
{City}
{State}
{Zip}

8C Is this correct?
1 YES
2 NO **Þ GO BACK TO 8B**

8D Where would you like to receive your diaries?
1 AT HOME **Þ SKIP TO Q9**
2 P.O. BOX
3 ANOTHER ADDRESS **Þ SKIP TO 8F**
8 DON'T KNOW **Þ THANK AND TERMINATE**
9 REFUSED **Þ THANK AND TERMINATE**

8E P.O. Box Number _____
City _____
State _____
Zip _____ **Þ SKIP TO Q9**

8F ST. NUMBER _____
ST. DIRECTION _____
ST. NAME _____
ST. SUFFIX _____
APT. NUMBER _____
CITY _____
STATE _____
ZIP _____

Q9 Is there anyone in your household who does not understand English?
1 YES
2 NO **Þ SKIP TO Q14**
8 DON'T KNOW **Þ SKIP TO Q14**
9 REFUSED **Þ SKIP TO Q14**

Q10 Will you or anyone else in your household be able to help them fill out the diaries?
1 YES **Þ SKIP TO Q14**
2 NO
8 DON'T KNOW
9 REFUSED

Q11 What is the language[1] they understand?

01 SPANISH
02 FRENCH **Þ SKIP TO Q13**
03 GERMAN **Þ SKIP TO Q13**
04 CHINESE
05 ITALIAN **Þ SKIP TO Q13**
06 TAGALOG **Þ SKIP TO Q13**
07 POLISH **Þ SKIP TO Q13**
08 KOREAN **Þ SKIP TO Q13**
09 INDIC **Þ SKIP TO Q13**
10 VIETNAMESE **Þ SKIP TO Q13**
11 OTHER (SPECIFY _____) **Þ SKIP TO Q13**
98 DON'T KNOW **Þ SKIP TO Q13**
99 REFUSED

Q12 We have instructions for completing the survey in English and {*if response to Q11 is 1*, "Spanish", *if it is 4* "Chinese Mandarin or Cantonese"}. In what language would you like the instructions?

1 ENGLISH
2 CHINESE - MANDARIN
3 CHINESE - CANTONESE
4 SPANISH

Q13 Is there anyone else, a friend or a neighbor, who can help this person fill out the diary?

1 YES
2 NO **Þ THANK AND TERMINATE**
8 DON'T KNOW **Þ THANK AND TERMINATE**
9 REFUSED **Þ THANK AND TERMINATE**

Q14 How many household members, including yourself, all infants and live-in domestic help live in your household?

ENTER THE NUMBER OF MEMBERS: _____
98 DON'T KNOW **Þ THANK AND TERMINATE**
99 REFUSED **Þ THANK AND TERMINATE**

Q15 We need some information about each person in your household, so we can prepare individual diaries. Again, I want to assure you that this information is for research purposes only and will be kept strictly confidential. Earlier, you indicated there were { # } persons in your household.

IF 3 OR MORE PERSONS IN HOUSEHOLD, ASK:
Excluding yourself what is the first name of youngest person in the household?
THEN ASK:
What's the first name of the next youngest person in the household? REPEAT THIS QUESTION UNTIL YOU HAVE NAMES FOR ALL THE OTHER HOUSEHOLD MEMBERS.
FOR THE RESPONDENT ASK:
What is your first name?

IF ONLY 2 PERSONS IN THE HOUSEHOLD, ASK: What is the other person's first name? THEN ASK: What is your first name?

Q15A. What is your last name?
ENTER THE LAST NAME:_____

[1] Source: U.S. Department of Commerce, Bureau of Census, Ethnic and Hispanic Branch, 1990 Census Special Tabulations

Q16 to Q70 are asked for each household member. Respondent's information is retrieved last.

Q16 And what is { NAME }'s gender? ASK THIS QUESTION ONLY FOR OTHER HOUSEHOLD MEMBERS
- 1 MALE
- 2 FEMALE
- 8 DON'T KNOW
- 9 REFUSED

Q17 What is {his/her/your} age in years?
ENTER AGE: _____
- 98 DON'T KNOW
- 99 REFUSED

Q18 {Does/Do} {he/she/you} have a valid driver's license? ASK ONLY IF Q17>15
- 1 YES
- 2 NO
- 8 DON'T KNOW
- 9 REFUSED

Q19 What is {his/her} relationship to you? SKIP FOR PERSON ANSWERING THE TELEPHONE
- 01 SELF
- 02 SPOUSE
- 03 SON/DAUGHTER
- 04 FATHER/MOTHER
- 05 BROTHER/SISTER
- 06 GRANDPARENT
- 07 GRANDCHILD
- 08 LIVE-IN HELP
- 09 ROOM MATE/OTHER NON-RELATED
- 10 OTHER RELATED
- 99 DON'T KNOW/ REFUSED

Q20 {Does/Do} {he/she/you} have a disability that limits the type of transportation {he/she/you} can use?
- 1 YES
- 2 NO Þ **SKIP TO Q22**
- 8 DON'T KNOW Þ **SKIP TO Q22**
- 9 REFUSED Þ **SKIP TO Q22**

Q21 What type of disability? MAXIMUM OF THREE RESPONSES ALLOWED
- 1 VISUAL OR BLIND
- 2 HEARING IMPAIRED OR DEAF
- 3 CANE OR WALKER
- 4 WHEELCHAIR NON-TRANSFERABLE
- 5 WHEELCHAIR TRANSFERABLE
- 6 COGNITIVELY CHALLENGED
- 7 OTHER
- 98 DON'T KNOW
- 99 REFUSED

Q22 {Is/Are} {he/she/you} enrolled in any level of school {or daycare}? ASK "OR DAYCARE" ONLY IF AGE<6.

1 YES
2 NO **Þ SKIP TO Q29 IF AGE >15 ELSE TO Q16**
8 DON'T KNOW **Þ SKIP TO Q29 IF AGE >15 ELSE TO Q16**
9 REFUSED **Þ SKIP TO Q29 IF AGE >15 ELSE TO Q16**

Q23 What type of school {is/are} {he/she/you} enrolled in?

1 DAYCARE
2 PRE-SCHOOL
3 KINDERGARTEN TO ELEMENTARY (GRADES K-6)
4 SECONDARY SCHOOL (GRADES 7-12)
5 VOCATIONAL/TECHNICAL SCHOOL
6 COLLEGE OR UNIVERSITY
7 ADULT SCHOOL
8 DON'T KNOW
9 REFUSED

Q24 What is the name of the school {he/she/you} {is/are} enrolled in?

1 NAME GIVEN: _____
98 DON'T KNOW
99 REFUSED

Q25 What is the address?

1 COMPLETE STREET ADDRESS KNOWN/GIVEN
2 CROSS STREETS KNOWN/GIVEN
98 DON'T KNOW
99 REFUSED

If complete address:
- ST NUMBER
- ST DIRECTION
- ST NAME
- ST TYPE
- APT/STE
- CITY
- STATE
- ZIP

If cross streets
- ST#1 DIRECTION
- ST#1 NAME
- ST#1 TYPE
- ST#2 DIRECTION
- ST#2 NAME
- ST#2 TYPE
- CITY
- STATE
- ZIP

Q26 How many days a week {does/do} {he/she/you} go to school?

1 1
2 2
3 3
4 4
5 5
6 6
7 7
8 DON'T KNOW
9 REFUSED

Q27 On one typical day how {does/do} {he/she/you} get to school? MULTIPLE RESPONSES ALLOWED BUT NOT EXPLICITLY REQUESTED

11 WALK
12 WHEELCHAIR
13 IN-LINE SKATES, ROLLER-SKATES
14 BICYCLE
21 AUTO DRIVER
22 AUTO PASSENGER
23 MOTORCYCLE/MOPED
31 GROUP RIDE (CARPOOL, VANPOOL, ETC.)
41 STANDARD LOCAL BUS
42 SCHOOL BUS
43 COMMUTER VAN/SHUTTLE BUS: FROM EMPLOYER OR GRP CONTRACT
44 COMMUTER VAN OR JITNEY, DIAL-A-BUS (PAY FARE)
45 EXPRESS BUS
46 CHARTER BUS
47 AIRPORT LINE
51 AMTRAK, GREYHOUND, AIRLINE, HELICOPTER
61 SUBWAY (INCLUDES NYCMTA)
62 PATH
63 NEWARK CITY SUBWAY
71 FERRY (INCLUDING ROOSEVELT ISLAND TRAM)
81 COMMUTER RAILROAD (LIRR, METRO NORTH, NJTRANSIT)
91 YELLOW/MEDALLION CAB
92 FOR HIRE VAN/JITNEY
93 CAR SERVICE (BLACK CAR)
94 GYPSY CAB
97 OTHER
98 DON'T KNOW
99 REFUSED

Q28 How much does it cost to park at or near the school?
ENTER THE AMOUNT AND THEN THE UNIT OF PAYMENT. ENTER $0.00 IF FREE
AMOUNT:
$ ___ ___ . ___ ____
999998 Don't know
999999 Refused

SELECT UNIT OF PAYMENT:

0 FREE
1 PER HOUR
2 PER DAY
3 PER WEEK
4 PER MONTH
5 PER QUARTER
6 PER SEMESTER
7 PER SCHOOL YEAR
8 DON'T KNOW
9 REFUSED

If age is 15 or under skip to Q16 for the next household member

Q29 {Is/Are} {he/she/you} employed?
1 YES Þ **SKIP TO Q31**
2 NO
8 DON'T KNOW
9 REFUSED

Q30 {Is/Are} {he/she/you} ...
1 RETIRED Þ **SKIP TO Q16 FOR NEXT HOUSEHOLD MEMBER**
2 HOMEMAKER Þ **SKIP TO Q16 FOR NEXT HOUSEHOLD MEMBER**
3 UNEMPLOYED BUT LOOKING FOR WORK Þ **SKIP TO Q16 FOR NEXT HOUSEHOLD MEMBER**
4 UNEMPLOYED AND NOT SEEKING EMPLOYMENT Þ **SKIP TO Q16 FOR NEXT HOUSEHOLD MEMBER**
5 STUDENT (PART TIME OR FULL TIME) Þ **SKIP TO Q16 FOR NEXT HOUSEHOLD MEMBER**
8 DON'T KNOW Þ **SKIP TO Q16 FOR NEXT HOUSEHOLD MEMBER**
9 REFUSED Þ **SKIP TO Q16 FOR NEXT HOUSEHOLD MEMBER**

Q31 {Does/Do} {he/she/you} have more than one job?
1 YES
2 NO
8 DON'T KNOW
9 REFUSED

I am going to ask some questions about {his/her/your} {main, *only if Q31 is 1}* job.

Q32 Is {his/her/your} employer . . .
1 A PRIVATE COMPANY,
2 GOVERNMENT,
3 SELF-EMPLOYED
4 OR, SOMETHING ELSE (SPECIFY _____)
98 DON'T KNOW
99 REFUSED

Q33 What activity best describes {his/her/your} job?
01 AGRICULTURE, FORESTRY, FISHERIES
02 MINING
03 CONSTRUCTION
04 MANUFACTURING - NONDURABLE GOODS
05 MANUFACTURING - DURABLE GOODS
06 TRANSPORTATION
07 COMMUNICATIONS, OTHER PUBLIC UTILITIES
08 WHOLESALE TRADE
09 RETAIL TRADE
10 FINANCE, INSURANCE, OR REAL ESTATE
11 BUSINESS AND REPAIR SERVICES
12 PERSONAL SERVICES
13 ENTERTAINMENT, OR RECREATION SERVICES
14 HEALTH SERVICES
15 EDUCATIONAL SERVICES
16 OTHER PROFESSIONAL AND RELATED SERVICES
17 PUBLIC ADMINISTRATION
97 OTHER (SPECIFY _____)
98 DON'T KNOW
99 REFUSED

Q34 How would you describe {his/her/your} occupation?

01 EXECUTIVE, ADMINISTRATIVE, OR MANAGERIAL
02 PROFESSIONAL SPECIALTY
03 TECHNICIAN AND RELATED SUPPORT
04 SALES
05 ADMINISTRATIVE SUPPORT, CLERICAL
06 PRIVATE HOUSEHOLD
07 PROTECTIVE SERVICE
08 SERVICE, EXCEPT PROTECTIVE AND HOUSEHOLD
09 FARMING, FORESTRY, OR FISHING
10 PRECISION, PRODUCTION, CRAFT, OR REPAIR
11 MACHINE OPERATOR, ASSEMBLER, OR INSPECTOR
12 TRANSPORTATION, OR MATERIAL MOVING
13 HANDLER, EQUIPMENT CLEANER, HELPER, OR LABORER
97 OTHER (SPECIFY _____)
98 DON'T KNOW
99 REFUSED

Q35 How long {has/have} {he/she/you} been working at this job?

ENTER THE NUMBER OF YEARS: _____ (00=LESS THAN 1 YEAR)
98 DON'T KNOW
99 REFUSED

Q36 On average, how many days per week {does/do} {he/she/you} work at {his,her,your} job regardless of location?

1 1
2 2
3 3
4 4
5 5
6 6
7 7
8 DON'T KNOW
9 REFUSED

Q37 On average, how many days per week {does/do} {he/she/you} work at home for {his,her,your} job instead of going to {his/her/your} workplace? Sometimes this is called telecommuting.

00 NONE/NEVER
01 1
02 2
03 3
04 4
05 5
06 6
07 7
97 OTHER (SPECIFY _____) (THIS INCLUDES ONCE A MONTH)
98 DON'T KNOW
99 REFUSED

Q38 {Does/Do} {he/she/you} work a compressed work week, such as 80 hours in 9 days, or 40 hours in 4 days?

1 YES
2 NO Þ **SKIP TO Q40**
8 DON'T KNOW Þ **SKIP TO Q40**
9 REFUSED Þ **SKIP TO Q40**

Q39 {Does/Do} {he/she/you} work four days per week (4/40) or nine days per two weeks (9/80)?
1 9/80
2 4/40
3 OTHER (SPECIFY _____)
8 DON'T KNOW
9 REFUSED

Q40 {Does/Do} {he/she/you} regularly work weekends?
1 YES
2 NO Þ **SKIP TO Q42**
8 DON'T KNOW Þ **SKIP TO Q42**
9 REFUSED Þ **SKIP TO Q42**

Q41 When in the weekend {does/do} {he/she/you} work? MULTIPLE RESPONSES ALLOWED
1 SATURDAY AM
2 SATURDAY PM
3 SUNDAY AM
4 SUNDAY PM
5 OTHER (SPECIFY _____)
8 DON'T KNOW
9 REFUSED

Q42 What is the name of {his/her/your} employer?
1 MAIN JOB NAME: _____
98 DON'T KNOW
99 REFUSED

Q43 What is the address of this workplace?
1 HOME Þ **SKIP TO Q46**
2 COMPLETE STREET ADDRESS KNOWN/GIVEN
3 CROSS STREETS KNOWN/GIVEN
8 DON'T KNOW
9 REFUSED

If complete address:
ST NUMBER
ST DIRECTION
ST NAME
ST TYPE
APT/STE
CITY
STATE
ZIP

If cross streets:
ST#1 DIRECTION
ST#1 NAME
ST#1 TYPE
ST#2 DIRECTION
ST#2 NAME
ST#2 TYPE
CITY
STATE
ZIP

Q44 What {does/do} {he/she/you} use most often to get to work? MULTIPLE RESPONSES ALLOWED BUT NOT EXPLICITLY REQUESTED

1 WALK
2 WHEELCHAIR
3 IN-LINE SKATES, ROLLER-SKATES
4 BICYCLE
5 AUTO DRIVER
6 AUTO PASSENGER
7 MOTORCYCLE/MOPED
8 GROUP RIDE (CARPOOL, VANPOOL, ETC.)
9 STANDARD LOCAL BUS
10 SCHOOL BUS
11 COMMUTER VAN/SHUTTLE BUS: FROM EMPLOYER OR GRP CONTRACT
12 COMMUTER VAN OR JITNEY, DIAL-A-BUS (PAY FARE)
13 EXPRESS BUS
14 CHARTER BUS
15 AIRPORT LINE
16 AMTRAK, GREYHOUND, AIRLINE, HELICOPTER
17 SUBWAY (INCLUDES NYCMTA)
18 PATH
19 NEWARK CITY SUBWAY
20 FERRY (INCLUDING ROOSEVELT ISLAND TRAM)
21 COMMUTER RAILROAD (LIRR, METRO NORTH, NJTRANSIT)
22 YELLOW/MEDALLION CAB
23 FOR HIRE VAN/JITNEY
24 CAR SERVICE (BLACK CAR)
25 GYPSY CAB
97 OTHER
98 DON'T KNOW
99 REFUSED

Q45 [IF Q44=21,22 OR 31] How many other people travel with {him/her/you} to work, excluding himself/herself/yourself?

00 NONE
01 1
02 2
03 3
04 4
05 5
06 6
07 7
08 8
10 OTHER (SPECIFY _____)
98 DON'T KNOW
99 REFUSED

Q46 {Does/Do} {he/she/you} usually need a vehicle at work for business purposes? (For example, sales calls or client meetings)

1 YES
2 NO
8 DON'T KNOW
9 REFUSED

Q47 How much does it cost to park at work (home)? If {he/she/you} {doesn't/don't} drive, please estimate how much parking would cost.
ENTER THE AMOUNT AND THEN THE UNIT OF PAYMENT. ENTER $0.00 IF FREE
ENTER AMOUNT:
$ ___ ___ . ___ ____
999998 DON'T KNOW
999999 REFUSED

SELECT UNIT OF PAYMENT:
0 FREE
1 PER HOUR
2 PER DAY
3 PER WEEK
4 PER MONTH
5 PER QUARTER
6 PER SEMESTER
7 PER SCHOOL YEAR
8 DON'T KNOW
9 REFUSED

Q48 Does {his/her/your} employer offer to pay for all or part of the cost of parking at work? [SKIP IF Q32 = 3]
1 YES
2 NO
8 DON'T KNOW
9 REFUSED

Q49 [IF Q44=21, 31] How much {does/do} it cost {him/her/you} personally to park at work? If {he/she/you} {doesn't/don't} drive, please estimate how much parking would cost.
[SKIP IF Q32 = 3]
ENTER THE AMOUNT AND THEN THE UNIT OF PAYMENT. ENTER $0.00 IF FREE
ENTER AMOUNT:
$ ___ ___ . ___ ____
999998 DON'T KNOW
999999 REFUSED
SELECT UNIT OF PAYMENT:
0 FREE
1 PER HOUR
2 PER DAY
3 PER WEEK
4 PER MONTH
5 PER QUARTER
6 PER SEMESTER
7 PER SCHOOL YEAR
8 DON'T KNOW
9 REFUSED

Q50 What kind of parking is available at or close to work/home?
1 IN A PARKING LOT OR GARAGE AT WORK
2 IN A PARKING LOT OR GARAGE OFF-SITE
3 ON THE STREET
4 IN A PARKING LOT OR GARAGE AT HOME **Þ SKIP TO Q52**
8 DON'T KNOW
9 REFUSED

Q51 How long in minutes does {he/she/you} or would {he/she/you} walk from this parking area to work?
ENTER THE MINUTES: _____
98 REFUSED
99 DON'T KNOW

Q52 Does {his/her/your} employer offer TransitChek or some other way to pay for all or part of the cost of using transit? [SKIP IF Q44 = 21 22 23]
1 YES, ALL OR PART
2 NO Þ **SKIP TO Q54**
8 DON'T KNOW Þ **SKIP TO Q54**
9 REFUSED Þ **SKIP TO Q54**

Q53 {Does/Do} {he/she/you} take advantage of it? [SKIP IF Q44 = 21 22 23]
1 YES
2 NO
8 DON'T KNOW
9 REFUSED

Q54 What does it personally cost {him/her/you} to buy a bus/rail pass? [SKIP IF Q44 = 21 22 23]. ENTER THE AMOUNT AND THEN SELECT THE UNIT. [ENTER $0.00 IF FREE]
ENTER THE AMOUNT:
$ ___ ___ . ___ ____
999998 DON'T KNOW
999999 REFUSED

SELECT THE UNIT OF PAYMENT:
0 FREE
1 PER DAY
2 PER WEEK
3 PER MONTH
4 PER YEAR
5 _____
8 DON'T KNOW
9 REFUSED

Q55 At {his/her/your} regular job, does {he/she/you} work a schedule or shift that changes on a regular basis?
1 YES
2 NO Þ **SKIP TO Q57**
8 DON'T KNOW Þ **SKIP TO Q57**
9 REFUSED Þ **SKIP TO Q57**

Q56 How often does the shift change?
1 EVERY DAY
2 EVERY WEEK
3 EVERY MONTH
4 EVERY QUARTER
5 OR SOMETHING ELSE (SPECIFY _____)
98 DON'T KNOW
99 REFUSED

Q57 What time does {he/she/you} typically start work at {his/her/your} job?
___ ___ : ___ ___ [ENTER THE TIME]

Is this A.M. or P.M.?
1 A.M.
2 P.M.
98 DON'T KNOW
99 REFUSED

Q58 What time does {he/she/you} typically end work at {his/her/your} job?
___ ___ : ___ ___ [ENTER THE TIME]
Is this A.M. or P.M.?
1 A.M.
2 P.M.
98 DON'T KNOW
99 REFUSED

Q59 Are {his/her/your} start and end times at this job about the same every day?
1 YES **Þ SKIP TO Q62**
2 NO
8 DON'T KNOW **Þ SKIP TO Q62**
9 REFUSED **Þ SKIP TO Q62**

Q60 How much can {his/her/your} job's start times vary from the usual start time?
1 START TIME CANNOT VARY
2 WITHIN 15 MINUTES OR LESS
3 16 TO 30 MINUTES
4 31 TO 60 MINUTES
5 MORE THAN 1 HOUR TO 2 HOURS
6 OR, SOMETHING ELSE (SPECIFY _____)
8 DON'T KNOW
9 REFUSED

Q61 How much can {his/her/your} job's end times vary from the usual end time?
1 END TIME CANNOT VARY
2 WITHIN 15 MINUTES OR LESS
3 16 TO 30 MINUTES
4 31 TO 60 MINUTES
5 MORE THAN 1 HOUR TO 2 HOURS
6 OR, SOMETHING ELSE (SPECIFY _____)
8 DON'T KNOW
9 REFUSED

The following questions are asked only if response to Q31 is 1. Otherwise go to next household member.

Q62 What is the name of {his/her/your} second employer?
1 SECOND JOB NAME: _____
98 DON'T KNOW
99 REFUSED

Q63 Is {his/her/your} second employer ...
1 A PRIVATE COMPANY
2 GOVERNMENT
3 HIMSELF/HERSELF (SELF-EMPLOYED)
7 OR, SOMETHING ELSE (SPECIFY _____)
98 DON'T KNOW
99 REFUSED

Q64 What is the address of {his/her/your} second workplace?

1 COMPLETE STREET ADDRESS KNOWN/GIVEN
2 CROSS STREETS KNOWN/GIVEN
8 DON'T KNOW
9 REFUSED

IF COMPLETE ADDRESS:

ST NUMBER
ST DIRECTION
ST NAME
ST TYPE
APT/STE
CITY
STATE
ZIP

IF CROSS STREETS:

ST#1 DIRECTION
ST#1 NAME
ST#1 TYPE
ST#2 DIRECTION
ST#2 NAME
ST#2 TYPE
CITY
STATE
ZIP

Q65 What activity best describes {his/her/your} second job?

01 AGRICULTURE, FORESTRY, FISHERIES
02 MINING
03 CONSTRUCTION
04 MANUFACTURING - NONDURABLE GOODS
05 MANUFACTURING - DURABLE GOODS
06 TRANSPORTATION
07 COMMUNICATIONS, OTHER PUBLIC UTILITIES
08 WHOLESALE TRADE
09 RETAIL TRADE
10 FINANCE, INSURANCE, OR REAL ESTATE
11 BUSINESS AND REPAIR SERVICES
12 PERSONAL SERVICES
13 ENTERTAINMENT, OR RECREATION SERVICES
14 HEALTH SERVICES
15 EDUCATIONAL SERVICES
16 OTHER PROFESSIONAL AND RELATED SERVICES
17 PUBLIC ADMINISTRATION
97 OTHER (SPECIFY _____)
98 DON'T KNOW
99 REFUSED

Q66 How would you describe {his/her/your} occupation at {his/her/your} second job?

01 EXECUTIVE, ADMINISTRATIVE, OR MANAGERIAL
02 PROFESSIONAL SPECIALTY
03 TECHNICIAN AND RELATED SUPPORT
04 SALES
05 ADMINISTRATIVE SUPPORT, CLERICAL
06 PRIVATE HOUSEHOLD
07 PROTECTIVE SERVICE
08 SERVICE, EXCEPT PROTECTIVE AND HOUSEHOLD
09 FARMING, FORESTRY, OR FISHING
10 PRECISION, PRODUCTION, CRAFT, OR REPAIR
11 MACHINE OPERATOR, ASSEMBLER, OR INSPECTOR
12 TRANSPORTATION, OR MATERIAL MOVING
13 HANDLER, EQUIPMENT CLEANER, HELPER, OR LABORER
14 OTHER (SPECIFY _____)
98 DON'T KNOW
99 REFUSED

Q67 On average, how many days per week does {he/she/you} work at {his/her/your} second job?

1 1
2 2
3 3
4 4
5 5
6 6
7 7
8 DON'T KNOW
9 REFUSED

Q68 On average, how many days per week does {he/she/you} work at home for {his/her/your} second job instead of going to {his/her/your} workplace? Sometimes this is called telecommuting.

00 NONE/NEVER
01 1
02 2
03 3
04 4
05 5
06 6
07 7
97 OTHER (SPECIFY _____) (THIS INCLUDES ONCE A MONTH)
98 DON'T KNOW
99 REFUSED

Q69 What time does {he/she/you} typically start work at {his/her/your} second job?

___ ___ : ___ ___ [ENTER THE TIME]

Is this a.m. or p.m.?

1 A.M.
2 P.M.
8 DON'T KNOW
9 REFUSED

Q70 What time does {he/she/you} typically end work at {his/her/your} second job?

___ ___ : ___ ___ [ENTER THE TIME]

Is this a.m. or p.m.?

1 A.M.
2 P.M.
8 DON'T KNOW
9 REFUSED

Q16 to Q70 are repeated for each of the other household members in ascending age order; the sequence is then asked (in the second person) for the Household Informant that is being interviewed.

Q71 As I said earlier, we'll send you a diary for each household member to complete. Now I just have a few more questions about your household.

Q72 How many separate telephone numbers are there to your current home?

_____ (IF 1 Þ **SKIP TO Q74**)

98 DON'T KNOW
99 REFUSED

Q73 How many of these telephone numbers, if any, are dedicated to a FAX machine or modem?

_____

98 DON'T KNOW
99 REFUSED

Q74 In the past 12 months, have there been times, even for a few days, when you did not have phone service at your home?

1 YES
2 NO **Þ SKIP TO Q76**
8 DON'T KNOW **Þ SKIP TO Q76**
9 REFUSED **Þ SKIP TO Q76**

Q75 How long were you without a phone service?

1 LESS THAN 2 WEEKS
2 2 WEEKS TO LESS THAN 1 MONTH
3 1 MONTH TO LESS THAN 3 MONTHS
4 3 MONTHS TO LESS THAN 6 MONTHS
5 6 MONTHS TO LESS THAN 1 YEAR
8 DON'T KNOW
9 REFUSED

Q76 Does your household share a phone line with another household?

1 YES
2 NO **Þ SKIP TO Q78**
98 DON'T KNOW **Þ SKIP TO Q78**
99 REFUSED **Þ SKIP TO Q78**

Q77 How many households share a phone line with your household?

ENTER THE NUMBER OF HOUSEHOLDS: _____

98 DON'T KNOW
99 REFUSED

Q78 Which of the following best describes your ethnicity?

01 BLACK/AFRICAN AMERICAN, NON-HISPANIC
02 WHITE, NON-HISPANIC
03 ASIAN/PACIFIC ISLANDER
04 AMERICAN INDIAN
05 HISPANIC
06 OTHER (SPECIFY _____)
98 DON'T KNOW
99 REFUSED

Q79 What was your total annual household income last year from all sources before taxes, for all members of your household? I will read you a series of income ranges. Please stop me when I read the range that is closest to your household's.

01 less than $10,000
02 $10,000 to $14,999
03 $15,000 to $24,999
04 $25,000 to $34,999
05 $35,000 to $49,999
06 $50,000 to $74,999
07 $75,000 to $99,999
08 $100,000 to $124,999
09 $125,000 to $149,999
10 $150,000 or more
98 DON'T KNOW
99 REFUSED

Section 9: Travel Day determination
These questions are asked at the end of the interview, after the respondent has answered question 79.

79A Now let me give you the day on which we would like for everyone in your household to keep track of their activities.
The day is "[DAY OF THE WEEK AND DATE]." Is this day OK?
1 YES
2 NO Þ **FILL OUT CALLBACK CARD**
Enter Assignment Number _____

79B Are you expecting any out-of-town guests on that date?
1 YES Þ **REASSIGN TO DATE WHEN NO VISITORS**
2 NO
8 DON'T KNOW
9 REFUSED

79C I'd like to verify that I reached you at {PHONE NUMBER}. Is this correct?
1 NUMBER IS CORRECT
2 NUMBER IS INCORRECT (TYPE CORRECT NUMBER _____)

79D I'll call to collect your activity information the day following your travel day, which is next [day]. When I call, would you prefer to be called in the morning between 9:00 and noon., in the afternoon between noon and 5:00 p.m., or in the evening between 5:00 and 9:00 p.m.?"
1 MORNING (9:00 - noon.)
2 AFTERNOON (noon - 5:00 P.M.)
3 EVENING (5:00 - 9:00 P.M.)
4 NO BEST TIME TO CALL
9 DON'T KNOW/REFUSE

79E Is there a different phone number where you or another member of your household would prefer to be called when we collect your information?
1 YES
2 NONE Þ **SKIP TO 79F**
8 DON'T KNOW Þ **SKIP TO 79F**
9 REFUSED Þ **SKIP TO 79F**

79F What is that phone number?

ENTER THE PHONE NUMBER: _____

79G Thank you very much for helping us. We'll call you on the evening of [DAY] to make sure you received your diaries and to answer any questions. We also want you to know that by writing down complete and accurate answers in the diaries -- including full addresses for each place you visit during the diary day -- you'll help to make the transportation system better. If you have any questions or comments about the study, you can all the Transportation Futures Study at 1-800-619-3601. Thank you and have a nice evening/day.
Thank you for taking the time to talk to us today.
That completes the survey. On behalf ..... I'd like to thank you for your time and participation.

Appendix C – Survey Materials

Sample Packet Letter

TRANSPORTATION FUTURES PROJECT

NEW YORK METROPOLITAN TRANSPORTATION COUNCIL
1 World Trade Center, Suite 82 East
New York, NY 10048-0042

NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY, INC
One Newark Center, 17th Floor
Newark, NJ 07102-1982

PARSONS BRINCKERHOFF
One Penn Plaza
2nd Floor
New York, NY 10119-0061

NUSTATS INTERNATIONAL
3006 Bee Caves Road
Suite A-300
Austin, TX 78746

EBONY MARKETING RESEARCH
2100 Bartow Avenue
Suite 243
Baychester Bronx, NY 10475

March 1, 1997

«RESPFNAME» «RESPLNAME»
«STNUM» «STDIR» «STNAM» «STTYP» «SUITE»
«CITY» «STATE» «ZIP1»

Dear «RESPFNAME» «RESPLNAME»:

Thank you for agreeing to participate in the **Transportation Futures Project**. In addition to the information you have kindly provided, we need a record of one day of travel and activities from every person in the family. The enclosed materials are what you need for recording the information we will need. **The most important is the diary that should be used by each person.**

Please take a moment to check that the information below about your vehicles and household members. If we made a mistake, please let us know when we call you so we can correct it.

YOUR HOUSEHOLD:

Household Member Name	Age	Gender	Employed	Occupation	Industry
«FNAME1»	«AGE1»	«GENDER1»	«EMPLOY1»	«W1OCC1»	«W1IND1»
«FNAME2»	«AGE2»	«GENDER2»	«EMPLOY2»	«W1OCC2»	«W1IND2»
«FNAME3»	«AGE3»	«GENDER3»	«EMPLOY3»	«W1OCC3»	«W1IND3»

YOUR VEHICLES:
Please verify your vehicle information. Please record the information even if the vehicle is not used.

Year	Type
«VHYR1»	«VHTYP1»
«VHYR2»	«VHTYP2»

Your participation is important toward meeting these goals. **All information collected is strictly confidential and will be used for research purposes only.** The information your household records in the enclosed diaries will be combined with data from all other participating area residents.

We very much appreciate your taking the time to help with this worthwhile project. All households that participate in this study have an opportunity to win a pair of airline tickets to any continental U.S. destination. These tickets contributed by a private company, are offered as a token of our appreciation for your time. If you have any questions or comments, please call me at 1-800-619-3601.
Sincerely,
Stacey Bricka
Project Manager

Figure 2
Appreciation Notice

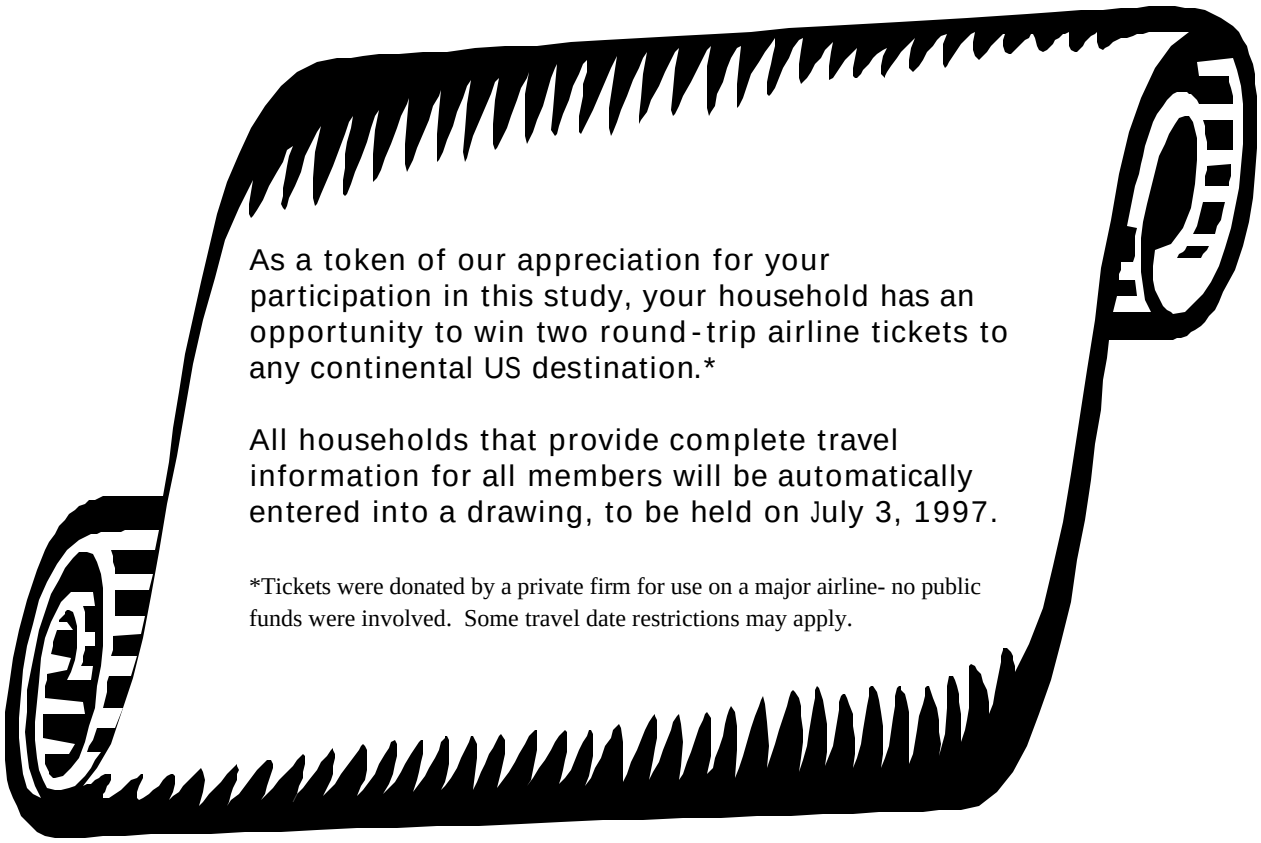


Figure 3
Refrigerator Magnet

S

Your Personal One-Day Travel Diary

Prepared Especially For:

TRANSPORTATION FUTURES PROJECT

This is your personal diary.

Each person needs to complete a 24-hour diary of **PLACES** visited (what and where they are) and **TRIPS** made (when and how you make these trips). We also ask what **ACTIVITIES** you do in each **PLACE**.

The main items you need to keep track of are:

- **PLACES** you go to, by name and/or address *as exact as possible*;
- **TIMES** you leave from and arrive at these places, *to the minute if possible*;
- **ACTIVITIES** you do at each place; and
- **MODES** or methods of travel you use to go from place to place. Frequently, it can be several, such as *walk* to bus stop, take *bus* to subway, take *subway* to midtown, *walk* from subway station to the workplace.

The day after your travel day, we will call you to collect all of the information by phone. We will help deal with any gaps and ask about parking, transit, tolls, and other details of how you travel.

For young children and for those who cannot complete a diary by themselves, we ask that a parent or other adult complete the diary for them.

Please note that specific and exact details are very important.

shown in the enclosed Example Diary (ivory colored), you should use one page for ch **PLACE** you go to during your 24-hour day.

hat is a PLACE? It is every different location (different building, different address) u travel to during the day. It can be a school where you stay seven hours, or a soline station you are at for only 5 minutes to get gas, or your son's school where you op for only 30 seconds to drop him off, or a restaurant where you have lunch. A **LACE** is any location you stop at, even if it's just on your way to work or to somewhere se.

ou start your 24-hour day at home, then **PLACE** #1 will be your home. After that, ch new **PLACE** you go to will have one new page in your diary. There are 12 pages **PLACES** and another page for an additional six. If you need more space, please e additional sheets of paper to record the extra information.

ew other important tips:

Any time you drop someone off or pick someone up, you should record that location as a **PLACE** in your diary.

Make sure you check off all **ACTIVITIES** you do at each **PLACE**.

If you make trips in the day as part of your work (as a mail carrier, or delivery person, or outside sales rep), record only your trip from home to your first work place and from your last work place to where you went after work.

Please call the Transportation Futures Hotline toll free at 1-800-619-3601 if you have any questions.

Thank you for helping the Transportation Futures Project!

TYPES OF TRANSPORTATION FOR:

"HOW did you get from Place to Place?"

WALK
WHEELCHAIR
IN-LINE OR ROLLER SKATES
BICYCLE
AUTO AS THE DRIVER
AUTO AS THE PASSENGER
MOTORCYCLE / MOPED
GROUP RIDE / (CARPOOL. ETC)
STANDARD LOCAL BUS
SCHOOL BUS
COMMUTER VAN/SHUTTLE BUS
COMMUTER VAN OR JITNEY
EXPRESS BUS
CHARTER BUS
AIRPORT BUS / SHUTTLE
AMTRAK,GREYHOUND,AIRLINE
SUBWAY(NYC, STATEN ISLAND RAIL)
PATH
NEWARK CITY SUBWAY
FERRY(ROOSEVELT ISLAND TRAM)
COMMUTER RAIL(LIRR,NJTRANSIT)
YELLOW/MEDALLION CAB
FOR HIRE VAN/JITNEY
BLACK CAB CAR SERVICE
GYPSY CAB

Place #

1

START HERE

For this diary, your day begins at 3:00 am. Most people are home asleep at 3:00 am. If this is the case, then check "My Home," make note of the exact time you left home for the first time on your diary day, and check all the activities you did before leaving home.

(Complete the information below if you have not already provided it)

I My Home
I My Regular Workplace
I My School
I Another Place ➔

Name of Place (if any)

Street Address

City State Zip

& Nearest Cross Streets

WHAT did you do here? *(Check all that apply)*

- ❑ Drop-off/ pick-up someone
- ❑ Visit friends/ relatives
- ❑ Eat meals
- ❑ Social/recreational/entertainment
- ❑ Shop
- ❑ Doctor/dentist/other professional
- ❑ Other family or personal business
- ❑ Religious or civic
- ❑ Other activities not-at-home (Specify):
- ❑ Work at home (job related)
- ❑ Work at regular jobsite
- ❑ Work activity at other place
- ❑ School at regular place
- ❑ School activity at other place
- ❑ Sleep
- ❑ Other activities at home

rom Place #1, did you o to another place uring your 24-hour ay?

NO- You stayed in one place all 24 hours.

Check here: ❑ **DONE**

YES- At what time did you leave Place #1 to go to Place #2?

: am/pm

NEXT PLACE #2

Place # 2

❑ My Home
❑ My Regular Workplace
❑ My School
❑ Other Place (address already provided)
❑ A New Place ➔

Name of Place (if any)
Street Address
City State Zip
& Nearest Cross Streets

At WHAT TIME did you ARRIVE at Place #2?

: am/pm

HOW did you get from Place #1 to Place #2?

Show ALL the methods of travel you used to make this trip.

1st → 2nd → 3rd → 4th → 5th

If you used TRANSIT (Bus, Rail, Subway, Ferry, Other)

Line #/ Service	Station Name (if Rail or Subway)
First board:	at:
1st transfer:	at:
2nd transfer:	at:
Last Station	at:

WHAT did you do at Place # 2? *(Check all that apply)*

❑ Drop-off/ pick-up someone
❑ Visit friends/ relatives
❑ Eat meals
❑ Social/recreational/entertainment
❑ Shop
❑ Doctor/dentist/other professional
❑ Other family or personal business
❑ Religious or civic
❑ Other activities not-at-home (Specify):
❑ Work at home (job related)
❑ Work at regular jobsite
❑ Work activity at other place
❑ School at regular place
❑ School activity at other place
❑ Sleep
❑ Other activities at home

From Place #2 did you go to another place during your 24-hour day?

NO- This was your LAST place for the 24-hour day.

Check here: ❑ **DONE**

YES- At what time did you leave Place #2 to go to Place #3?

: am/pm

NEXT PLACE #3

Place # 3

❑ My Home
❑ My Regular Workplace
❑ My School
❑ Other Place (address already provided)
❑ A New Place ➔

Name of Place (if any)
Street Address
City State Zip
& Nearest Cross Streets

At WHAT TIME did you ARRIVE at Place #3?

: am/pm

HOW did you get from Place #2 to Place #3?

Show ALL the methods of travel you used to make this trip.

1st → 2nd → 3rd → 4th → 5th

If you used TRANSIT (Bus, Rail, Subway, Ferry, Other)

Line #/ Service	Station Name (if Rail or Subway)
First board:	at:
1st transfer:	at:
2nd transfer:	at:
Last Station	at:

WHAT did you do at Place # 3? *(Check all that apply)*

❑ Drop-off/ pick-up someone
❑ Visit friends/ relatives
❑ Eat meals
❑ Social/recreational/entertainment
❑ Shop
❑ Doctor/dentist/other professional
❑ Other family or personal business
❑ Religious or civic
❑ Other activities not-at-home (Specify):
❑ Work at home (job related)
❑ Work at regular jobsite
❑ Work activity at other place
❑ School at regular place
❑ School activity at other place
❑ Sleep
❑ Other activities at home

From Place #3 did you go to another place during your 24-hour day?

NO- This was your LAST place for the 24-hour day.

Check here: ❑ **DONE**

YES- At what time did you leave Place #3 to go to Place #4?

: am/pm

NEXT PLACE #4

Appendix D – Retrieval Interview

Interview Completion Form for Project # 962011

This form must be completed and attached to the front of each completed survey. For a retrieval survey to be considered complete, you are required to verify each of the following items carefully. By initialing each item, you are certifying that you did the indicated task and that it is correct.

1. Does the # of people in the household equal the # you have data for? _____

2. Is the income level of the household indicated on the label or Q5 of the retrieval form? If not, did you ask for it? _____

3. Did you verify the demographic data? _____

4. Did you verify the vehicle information? _____

5. If the household members did not travel anywhere on their assigned travel day, please explain why on the lines below. _____
   Person#____ Why?_____
   Person#____ Why?_____
   Person#____ Why?_____
   Person#____ Why?_____

6. If a person did not have any work or school trips, please explain. _____
   Person#____ Why?_____
   Person#____ Why?_____
   Person#____ Why?_____
   Person#____ Why?_____

7a. If there are any shared/linked trips (for example: husband and wife going to the same location), are the complete addresses recorded in each trip's address blocks? _____
7b. Did both or all household members report each shared trip? _____

8. Does every trip for each household member have the best possible place name and address that you could obtain from the respondent? _____

9. Did each person return home on the last trip? If not, why not? _____
   Person#____ Why?_____
   Person#____ Why?_____
   Person#____ Why?_____
   Person#____ Why?_____

10. Is your writing throughout the survey legible enough that our data entry staff will be able to enter all of the information on your survey? _____

11. Does it appear that you have appropriately circled responses, on each of the items that you were required to retrieve, for each respondent _____

For verification purposes, retrieval surveys must be "spot-checked" by a supervisor and at least 3 of the items above randomly selected for verification. Supervisors must place their initials next to the items verified. Supervisors must also sign this form to certify that they verified the items above and consider this survey to be a valid complete.

Supervisor Signature: _____ Date: _____

Quest.#: «QUEST» Sample Number: «SAMPN» Telephone #: «S_TEL» Preferred time: «Q131»

Section A

Hello, my name is [YOUR NAME] and I'm calling on behalf of the Transportation Futures Project sponsored by New York Metropolitan Transportation Council about the survey your household recently completed. May I please speak with «RESPFNAME» «RESPLNAME» ?

«Respfname» «RESPLNAME»
«ADDRESS»
«CITY», «STATE» «ZIP1»
Travel Day: «tday» Assignment #: «ASSIN»

[IF RESPONDENT NOT AVAILABLE, FILL UP CALL BACK INFO]
[IF RESPONDENT IS AVAILABLE ASK THE FOLLOWING QUESTIONS]

First I need to verify some information about your household, then I will begin collecting the activity information from the diaries we sent for each household member.

HOUSEHOLD MEMBER VERIFICATION

***Q1.** When we interviewed your household last week, we were told that there were «MLIVE» persons in your household and that their names and ages were:

«FNAME1»	«AGE1»	«GENDER1»	«FNAME4»	«AGE4»	«GENDER4»
«FNAME2»	«AGE2»	«GENDER2»	«FNAME5»	«AGE5»	«GENDER5»
«FNAME3»	«AGE3»	«GENDER3»	«FNAME6»	«AGE6»	«GENDER6»

Is this information correct? Yes [skip to Q2] No [ask: What corrections should I make?] [MAKE CORRECTIONS]

***Q2.** How many commercial vehicles arrived at your home to deliver packages, perform repairs, or provide other services during your assigned travel day (Exclude mailman)? _____

***Q3.** How many out-of-town visitors stayed at this residence during the travel day? _____

HOUSEHOLD VEHICLE INFORMATION

***Q4.** I show that your household has vehicles available for use including the following makes and models [READ/VERIFY THE YEAR, MAKE AND BODY TYPES ON THE LABEL -IF DK/RF OR OTHER IS SHOWN TRY TO OBTAIN IT]

«VHYR1» «VHTYP1»
«VHYR2» «VHTYP2»
«VHYR3» «VHTYP3»
«VHYR4» «VHTYP4»
«VHYR5» «VHTYP5»

Is this information correct? Yes [skip to Q5] No [ask: What corrections should I make?] [MAKE CORRECTIONS]

INCOME REFUSAL CONVERSION/VERIFICATION

***Q5 «ASKINC»** And the last piece of information I need to get is the total annual household income for last year, including all sources of combined income for the household. What would be the household income level?

[IF THEY ARE RELUCTANT TO SAY, READ:] Was it above or below $50,000? Above Below

Which range would it fall into? [Read the following categories]

[IF LESS THAT $50,000]		[IF MORE THAN $50,000]	
1	Less than $10,000	6	$50,000 to less than $75,000
2	$10,000 to less than $15,000	7	$75,000 to less than $100,000
3	$15,000 to less than $25,000	8	$100,000 to less than $125,000
4	$25,000 to less than $35,000	9	$125,000 to less than $150,000
5	$35,000 to less than $50,000	10	$150,000 or more
		98	[DON'T READ] Don't Know
		99	[DON'T READ] Refused

*Q6 Great, now I would like to collect the trip/activity information that your household recorded for _____. Let's begin with your information. Do you have your travel diaries handy?

[NEXT, BEGIN WITH THE FOLLOWING RETRIEVAL FORM AND COLLECT EACH ACTIVITY FOR EACH PERSON]

RESULT CODES

Eligibility Unknown	Eligible	Ineligible
1- No Answer	20- Completed	7- Disconnected
2- Busy	13- Partial Complete	8- Deaf/Language
3- Answering Machine	12- 2nd Refusal	9- Business/Govt
4- Call Back -respondent not reached		10- Computer/Fax
5- Call Back - specific		
6- First Refusal		

HOUSEHOLD CONTACT RECORD

Attempt	Date	Time	Int#/Initial	Result	Contact Notes
1					
2					
3					
4					

5					
6					

Sample No: _____

Person No: _____

Person Name: _____

Interviewed in Person 1.Yes 2.No ==> Complete PROXY ===>

PROXY Reporting

Did Person Use the Diary? 1.Yes 2.No

Who reported the data? Name _____

How many places did you visit during your diary day? _____

Person No. _____

[INTERVIEWER NOTE: DO NOT END INTERVIEW UNTIL ALL PLACES HAVE BEEN ACCOUNTED FOR]

Place 1

1. Where were you at 3:00 AM?

1 My Home
2 My Regular Workplace
3 My School
4 Another Place (Specify Below)

IF RESPONSE IS NOT HOME, CONFIRM LOCATION:
At 3:00 AM, you were at:
Place Name:
_____
Address:
_____
Nearest Cross-Street: _____
City: _____
County: _____
Zipcode: _____

2. What did you do here? (check all that apply)

1 Drop off/pick up someone
2 Visit friends/relatives
3 Eat meals
4 Social/recreation/entertainment
5 Shop
6 Doctor/dentist/other professional
7 Other family or personal business
8 Religious or civic
9 Work at home (job related)
10 Work at regular jobsite
11 Work activity at other place
12 School at regular place
13 School activity at other place
14 Sleep
15 Other activities at home
16 Other activities not-at-home (Specify):_____

(Double Check For Inconsistent Activities)

At what time did you leave place #1?: _____ am/pm

If did not leave home all day, ask
"This means you were home all day. Is that correct?"
Yes: ASK No: Continue unto new page
Did you go to work/school? If NO, explain

If OUT OF TOWN:
Where (City, State)
Did you stay at a (circle one)
Residence Hotel/Motel School Other _____

At what time did you leave this place?: _____ am/pm

Place #: _____

Time of Arrival: _____ am/pm

Did you make any stops along the way 1.Yes 2.No If YES: Insert new place

1. What type of place did you go to next?	**2. What did you do here?**	**3. How did you get here?**	**AUTO**	**If Auto Driver:**	**If TRANSIT (ANY):**	**If TRANSIT (ANY):**
1 My Home	1 Drop off/pick up someone	Please tell me in the order	4 Did you use any of your	8 If drove to destination, where did you park?	Is TRAIN = 1. Subway 2. Commuter Rail	**15. Payment Information:**
2 My Regular Workplace	2 Visit friends/relatives	of methods of travel used.	HH vehicles to get here?	1.Street 2.Garage 3.Parking Lot 4.Other _____	Is BUS = 3. Local 4. Express	A.1st Payment:How did you pay your fare?
3 My School	3 Eat meals	1)	1. Yes 2. No	COST: $_____ per 1.hour 2.day 3.week 4.month	12. Where did you board?	1.Cash 2.Token 3.Weekly Pass 4. Monthly Pass .Metrocard
4 Other Place - Already provided address	4 Social/recreation/entertainment		IF YES: Veh No.	5.Other (specify)	Station name: _____	6.Other _____
Habitual Address Code?	5 Shop	2)	5 Were you the 1. driver	9 Did you pay any toll?	Line #/ Service: _____	B.2nd Payment:How did you pay your fare?
5 A New Place (Specify Below)	6 Doctor/dentist/other professional		or 2. passenger	1. Yes 2. No	13. How many times did you transfer?	1.Cash 2.Token 3.Weekly Pass 4. Monthly Pass .Metrocard
(If other):What is name & address of the place?	7 Other family/personal business	3)	**FOR ALL TRIPS**	If yes, how much? $_____	0 1 2 3 4 5 > 5	6.Other _____
Place Name: _____	8 Religious or civic		6 How many people were	# Did you drop off or pick up	Line #/Service/Route Station	C.3rd Payment:How did you pay your fare?
Address: _____	9 Work at home (job related)	4)	traveling together, including	anyone? 1.Yes 2. No	1st transfer: _____	1.Cash 2.Token 3.Weekly Pass 4. Monthly Pass .Metrocard
Nearest Cross-Street: _____	1 Work at regular jobsite 0		yourself? _____	Was it a HH member? 1.Yes 2.No	2nd transfer: _____	6.Other _____
City: _____	1 Work activity at other place 1	5)	7 Of those, # HH: ____	If yes: which HH member(s)?	3rd transfer: _____	D.4th Payment:How did you pay your fare?
County/Borough: _____	1 School at regular place 2		Who? (Person #): _____		4th transfer: _____	1.Cash 2.Token 3.Weekly Pass 4. Monthly Pass .Metrocard
State: _____	1 School activity at other place 3	6)	_____	**If Auto Passenger:**	5th transfer _____	6.Other _____
Zipcode: _____	1 Sleep 4		_____	# Were you dropped off or picked up? 1.Yes 2.No By a HH member? 1.Yes 2.No	14. At which station did you exit? Station name: _____	E.5th Payment:How did you pay your fare?
	1 Other activities at home 5	NOTE: If CAB is used, you must indicate GYPSY, BLACK, OR YELLOW	# non-HH: _____			1.Cash 2.Token 3.Weekly Pass 4. Monthly Pass .Metrocard
	1 Other (Specify): 6 _____			If yes, who?		6.Other _____

(Double Check For Inconsistent Activities)

At what time did you leave this place?: _____ am/pm

Appendix E – Edit Check Program Detail

The edit check program developed by Parsons Brinckerhoff for use with the HIS data set is the most ambitious and comprehensive edit check program developed to date. The edit check program itself is written in FORTRAN, and used SPSS files as the main data input. The program checks for valid ranges and logical consistency both within and across the five data sets that comprise the HIS data set. These checks include the following:

All Files:
Verify that the values for each data item are valid (i.e., within the required range).

Household File
Number of vehicles indicated matches the number reported in the vehicle file.
Number of household members indicated matches the number reported in the person file.
Number of places indicated matches the number reported in the trip file.
Household location identifier is contained in the location file.

Person File
Person records exist for each household.
There are no person records for sample numbers that don't appear in the household file.
Number of places indicated matches the number reported in the trip file.
If student had no school activity on travel day, reason must be provided.
If worker has no work activity on travel day, reason must be provided.
If person has no travel on travel day, reason must be provided.
All reported locations exist in location file.

Vehicle File
Vehicle records exist for each household reporting at least one vehicle.
There are no vehicle records for sample numbers that don't appear in the household file.
Verify vehicles with model years before 1960.

Trip File
Records exist for all completed households.
There are no trip records for sample numbers that don't appear in the household file.
Travel mode is reported for all new places.
Place numbers are sequential and inclusive.
Travel times verified such that arrival time at place (n) must be before departure from place (n) AND arrival time at place (n+1) must be after departure from place (n)
Consistency between reported travel among household members for travel times, location, party size, and travel modes.
Consistency in reports of dropping off or picking up household members.
If reported location is HOME, activity must be a home activity.
If reported location is HOME, location number must match location number in household file.
If activity is WORK, reported location must be WORK (unless its verified that person works at home).
If activity is WORK, reported location must match work1 or work2 location in person file.
If activity is SCHOOL, reported location must match school location in person file.
If last location is not HOME, flag to confirm trips are not missing.

If reported mode is AUTO, all auto-related variables must be completed.
If reported mode is TRANSIT, all transit-related variables must be completed.
All reported locations exist in the location file.
Calculated distance and travel time for each mode must be consistent with specified maximum and minimum speeds.

Location File
All locations must have a geocode coordinate, census tract, and fips code.

The edit check program consists of three files: SPSS syntax to process and recode input files; control file to point to file locations, and executable program. The process for implementing the edit check program consists of five steps, as outlined below.

1. **File Management System**. The edit check program resides on the network, in a project specific sub-directory. An additional location is provided for the recoded files to ensure the edit check program uses the correct files.
2. **Prepare Deliverable Data Files.** The data files were prepared using the NuStats Continuous Data Flow program. All households identified as having complete travel information were included in the edit check process.
3. **Run SPSS Recode Syntax.** In order to execute PB's edit check program, the data must be recoded and exported as ASCII data. The SPSS syntax program performs the necessary data processing and exports the recoded files to the specified directory. Any warning messages that appear during the recoding could indicate that the data were improperly formatted. In the event this occurs, these must be addressed prior to executing the edit check program.
4. **Run Edit Check Program.** Once the recoded, ASCII formatted data files have been prepared, the edit check program can be executed. As the program runs, it will report the stage of data processing. The user is prompted to enter the maximum assignment number for households being edited. If no execution errors occur, the program will terminate normally and produce at least eight output files (depending on the number of output messages). These include:

List.out	program listing, which reports the contents of the control file and the contents of the household report file(s).
Hhfile01.rpt	Report file(s) containing output messages for all household data (i.e., household, person, vehicle, and trip/activity file discrepancies).
Loc.rpt	Report file containing output messages for location file data.
Auto.rpt	Report file containing speed check warning messages for auto trips.
Bike.rpt	Report file containing speed check warning messages for bike trips.
Rail.rpt	Report file containing speed check warning messages for rail trips.
Tran.rpt	Report file containing speed check warning messages for transit trips.
Walk.rpt	Report file containing speed check warning messages for walk trips.

5. **Edit and Clean Data**. The output files are imported into excel, combined, and assigned for editing and cleaning. Corrections are made directly into the master SPSS data files.

Once cleaning and editing is complete, the process is repeated until no error messages remain. Warning messages will remain, as they provide guidance to modelers in the use of the data.

Appendix F – Travel Days

Each household that agreed to participate in the project was assigned a specific day for recording their travel. The list below shows the specific days for which 11,264 households recorded their travel on this project. The information is listed in three columns:

- Assignment Number –the code that links the recorded data to the diary day.
- Travel Day –the calendar day on which travel was recorded.
- Households Reporting Data – the number of households recording travel on the travel day.

Assignment Number	Travel Day	Households Reporting Data
2	5/9/97	66
3	5/12/97	39
4	5/13/97	17
5	5/14/97	36
6	5/15/97	24
7	5/16/97	43
8	5/19/97	31
9	5/20/97	35
10	5/21/97	23
11	5/22/97	20
12	5/23/97	1
13	5/27/97	53
14	5/28/97	29
15	5/29/97	36
16	5/30/97	20
17	6/2/97	106
18	6/3/97	1
20	6/5/97	24
21	6/6/97	18
22	6/9/97	30
23	6/10/97	35
24	6/11/97	30
25	6/12/97	32
26	6/13/97	54
27	6/16/97	109
28	6/17/97	121
29	6/18/97	93
30	6/19/97	44
31	6/20/97	234
32	6/23/97	156
33	6/24/97	167
34	6/25/97	90
35	6/26/97	82
36	6/27/97	234
101	9/18/97	56
102	9/19/97	37
103	9/22/97	109

Assignment Number	Travel Day	Households Reporting Data
104	9/23/97	61
105	9/24/97	63
106	9/25/97	54
107	9/26/97	63
108	9/29/97	56
109	9/30/97	178
110	10/3/97	113
111	10/6/97	45
112	10/7/97	75
113	10/8/97	95
114	10/9/97	167
115	10/13/97	90
116	10/14/97	67
117	10/15/97	74
118	10/16/97	27
119	10/17/97	34
120	10/20/97	85
121	10/21/97	19
122	10/22/97	34
123	10/23/97	6
124	10/24/97	2
126	10/26/97	1
127	10/27/97	11
128	10/28/97	30
129	10/29/97	19
130	10/30/97	2
131	10/31/97	4
134	11/3/97	26
135	11/4/97	120
136	11/5/97	113
137	11/6/97	30
138	11/7/97	2
139	11/8/97	64
140	11/9/97	39
141	11/10/97	54
142	11/11/97	66
143	11/12/97	193
144	11/13/97	104
145	11/14/97	85
146	11/15/97	1
148	11/17/97	119
149	11/18/97	56
150	11/19/97	99
151	11/20/97	169
152	11/21/97	86
153	11/22/97	1
154	11/23/97	2
155	11/24/97	108
156	11/25/97	134
157	11/26/97	132
158	12/1/97	148
159	12/2/97	172

Assignment Number	Travel Day	Households Reporting Data
160	12/3/97	159
161	12/4/97	324
162	12/5/97	14
163	12/8/97	265
164	12/9/97	135
165	12/10/97	131
166	12/11/97	63
167	12/15/97	18
168	12/16/97	53
169	12/17/97	32
202	1/29/98	23
203	1/30/98	31
204	2/2/98	58
205	2/3/98	53
206	2/4/98	31
207	2/5/98	44
208	2/6/98	69
209	2/9/98	32
210	2/10/98	59
211	2/11/98	38
212	2/12/98	52
213	2/13/98	50
214	2/17/98	56
215	2/18/98	80
216	2/19/98	73
217	2/20/98	78
218	2/23/98	49
219	2/24/98	68
220	2/26/98	55
221	2/27/98	69
222	3/2/98	68
223	3/3/98	62
224	3/4/98	86
225	3/5/98	77
226	3/6/98	113
227	3/9/98	72
228	3/10/98	31
229	3/11/98	39
230	3/12/98	91
231	3/13/98	95
232	3/16/98	34
233	3/18/98	91
234	3/19/98	86
235	3/20/98	100
236	3/21/98	9
237	3/22/98	16
238	3/23/98	52
239	3/24/98	33
240	3/25/98	42
241	3/26/98	16
242	3/27/98	104

Assignment Number	Travel Day	Households Reporting Data
244	3/29/98	77
245	3/30/98	49
246	3/31/98	59
247	4/1/98	99
248	4/2/98	87
249	4/3/98	104
250	4/4/98	16
252	4/6/98	61
253	4/7/98	52
254	4/8/98	101
255	4/9/98	148
257	4/13/98	33
258	4/14/98	42
259	4/15/98	20
260	4/16/98	80
261	4/17/98	110
262	4/19/98	6
263	4/20/98	35
264	4/21/98	46
265	4/22/98	30
266	4/23/98	54
267	4/24/98	205
268	4/25/98	36
269	4/26/98	2
270	5/8/98	55
271	5/4/98	47
272	5/5/98	7
273	5/6/98	18
274	5/7/98	23
275	5/11/98	14
276	5/12/98	5
277	5/13/98	5
278	5/14/98	2
300	5/29/98	1

Appendix G – Statistical Reliability

The purpose of this appendix is to document the statistically significant ranges of specific survey results at the regional (95% confidence interval) and county (90% confidence interval) levels.

For purposes of the regional analysis, the data were divided into two groups: NY and NJ regions. The NJ region is comprised of all NJ households. The NY region is comprised of the NY and CT households. The county analysis relies on the county of residence. All analyses were conducted using unweighted data. All tables show the sampling error associated with the survey results. The variables included in this analysis were:

1. Household income (region and county) [Household file]
2. Household size (region and county) [Household file]
3. Travel mode to work (region and county) [Place file]
4. Travel time to work (region and county) [Place file]
5. Household vehicles (region and county) [Household file]
6. Total reported household trips (region and county) [Household file]
7. Number of work trips to Manhattan vs. non-Manhattan location (region and county) [Place file]

For **categorical** variables (household income, travel mode to work, and work location), binomial distributions were created in order to calculate the associated sampling errors. The sampling error for each binomial distribution is expressed as a percentage. In all cases, the sampling errors were manually calculated based upon the sample sizes and proportions within the respective binomial distributions. The binomial distribution for household income (set at the levels of under $50k and $50k+) was chosen based on a calculation of the mean category. In the case of travel mode to work, the distribution divides the modes into auto and non-auto travel. Work location was specified as Manhattan vs. non-Manhattan in the NJTPA instructions for preparing this memo.

For **continuous** variables (household size, travel time to work, household vehicles, and total household trips), the sampling error was calculated based on the unweighted mean. The corresponding tables in this memo reflect sample size, mean, sampling error, and confidence intervals for each variable.

The following is a summary of the results of the statistical analysis, both for the regional and county levels.

Table 1
Sampling Error of Household Income at the Regional Level (95% confidence level)

	Region	N	< $50k	$50k+	Sampling Error
	New York	4591	48.9%	51.1%	+/- 1.45%
	New Jersey	3691	44.4%	55.6%	+/- 1.60%

Base: All weekday households reporting income, unweighted.
Based on binomial distribution of incomes (<$50k and $50k+), expressed in percentages.
Note: The confidence interval is calculated by adding and subtracting the sampling error to the distribution.

Table 2
Sampling Error of Household Income at the County Level (90% confidence level)

FIPS Code	County	N	< $50k	$50k+	Sampling Error
9001	Fairfield, CT	192	34.4%	65.6%	+/- 5.66%
9009	New Haven, CT	136	50.0%	50.0%	+/- 7.07%
34003	Bergen, NJ	479	39.5%	60.5%	+/- 3.69%
34013	Essex, NJ	312	55.4%	44.6%	+/- 4.64%
34017	Hudson, NJ	354	62.4%	37.6%	+/- 4.25%
34019	Hunterdon, NJ	198	26.8%	73.2%	+/- 5.19%
34021	Mercer, NJ	313	40.6%	59.4%	+/- 4.58%
34023	Middlesex, NJ	294	46.6%	53.4%	+/- 4.80%
34025	Monmouth, NJ	319	42.9%	57.1%	+/- 4.57%
34027	Morris, NJ	223	28.7%	71.3%	+/- 5.00%
34029	Ocean, NJ	191	52.4%	47.6%	+/- 5.96%
34031	Passaic, NJ	207	57.5%	42.5%	+/- 5.67%
34035	Somerset, NJ	194	32.5%	67.5%	+/- 5.55%
34037	Sussex, NJ	214	37.9%	62.1%	+/- 5.47%
34039	Union, NJ	187	42.8%	57.2%	+/- 5.97%
34041	Warren, NJ	206	45.6%	54.4%	+/- 5.73%
36005	Bronx, NY	215	77.2%	22.8%	+/- 4.72%
36027	Dutchess, NY	211	45.0%	55.0%	+/- 5.65%
36047	Kings, NY	378	69.6%	30.4%	+/- 3.90%
36059	Nassau, NY	280	39.6%	60.4%	+/- 4.82%
36061	New York, NY	1195	48.0%	52.0%	+/- 2.38%
36071	Orange, NY	200	48.0%	52.0%	+/- 5.83%
36079	Putnam, NY	182	40.1%	59.9%	+/- 5.99%
36081	Queens, NY	217	65.4%	34.6%	+/- 5.33%
36085	Richmond, NY	638	49.2%	50.8%	+/- 3.27%
36087	Rockland, NY	173	38.2%	61.8%	+/- 6.10%
36103	Suffolk, NY	324	37.7%	62.3%	+/- 4.44%
36119	Westchester, NY	250	35.6%	64.4%	+/- 5.00%

Base: All weekday households reporting income, unweighted.
Based on binomial distribution of incomes (<$50k and $50k+), expressed in percentages.
Note: The confidence interval is calculated by adding and subtracting the sampling error to the distribution.

Table 3
Sampling Error of Household Size at the Regional Level (95% confidence level)

Region	N	Mean	Confidence Level Factor	Standard Error of the Mean	Sampling Error	Confidence Interval	
						Lower Bound	Upper Bound
New York	6021	2.37	1.96	0.0173	+/- 1.34	2.34	2.41
New Jersey	4950	2.50	1.96	0.0188	+/- 1.32	2.46	2.53

Base: All weekday households, unweighted.
Note: The confidence interval is calculated by first multiplying the standard error of the mean by the confidence level factor to determine the sampling error, then adding and subtracting the sampling error to the mean.

Table 4
Sampling Error of Household Size at the County Level (90% confidence level)

FIPS Code	County	N	Mean	Confidence Level Factor	Standard Error of the Mean	Sampling Error	Confidence Interval	
							Lower Bound	Upper Bound
9001	Fairfield, CT	270	2.41	1.645	0.0762	+/- 0.12	2.29	2.53
9009	New Haven, CT	160	2.16	1.645	0.0912	+/- 0.15	2.01	2.31
34003	Bergen, NJ	643	2.45	1.645	0.0504	+/-0.09	2.36	2.53
34013	Essex, NJ	418	2.50	1.645	0.0699	+/-0.11	2.39	2.62
34017	Hudson, NJ	489	2.32	1.645	0.0598	+/-0.10	2.22	2.42
34019	Hunterdon, NJ	276	2.72	1.645	0.0758	+/-.012	2.59	2.84
34021	Mercer, NJ	409	2.43	1.645	0.0627	+/-0.11	2.32	2.53
34023	Middlesex, NJ	376	2.50	1.645	0.0651	+/-0.11	2.39	2.61
34025	Monmouth, NJ	433	2.51	1.645	0.0662	+/-0.11	2.40	2.62
34027	Morris, NJ	288	2.62	1.645	0.0837	+/-0.14	2.48	2.76
34029	Ocean, NJ	269	2.39	1.645	0.0828	+/-0.13	2.26	2.53
34031	Passaic, NJ	275	2.44	1.645	0.0821	+/-0.14	2.30	2.57
34035	Somerset, NJ	266	2.48	1.645	0.0757	+/-0.12	2.36	2.61
34037	Sussex, NJ	277	2.71	1.645	0.0761	+/-0.12	2.59	2.84
34039	Union, NJ	260	2.51	1.645	0.0813	+/-0.14	2.38	2.65
34041	Warren, NJ	271	2.61	1.645	0.0764	+/-0.13	2.48	2.73
36005	Bronx, NY	271	2.45	1.645	0.0850	+/-0.14	2.31	2.59
36027	Dutchess, NY	275	2.57	1.645	0.0776	+/-0.13	2.44	2.70
3604	Kings, NY	489	2.65	1.645	0.0682	+/-0.12	2.53	2.76

7								
36059	Nassau, NY	384	2.55	1.645	0.0703	+/-0.12	2.44	2.67
36061	New York, NY	1548	1.80	1.645	0.0273	+/-0.05	1.75	1.84
36071	Orange, NY	270	2.75	1.645	0.0867	+/-0.15	2.61	2.90
36079	Putnam, NY	261	2.65	1.645	0.0842	+/-0.14	2.51	2.79
36081	Queens, NY	276	2.49	1.645	0.0833	+/-0.14	2.35	2.63
36085	Richmond, NY	813	2.55	1.645	0.0458	+/-0.08	2.48	2.63
36087	Rockland, NY	250	2.76	1.645	0.0886	+/-0.15	2.61	2.90
36103	Suffolk, NY	432	2.74	1.645	0.0663	+/-0.11	2.63	2.85
36119	Westchester, NY	322	2.45	1.645	0.0729	+/-0.12	2.33	2.57

Base: All weekday households, unweighted.

Note: The confidence interval is calculated by first multiplying the standard error of the mean by the confidence level factor to determine the sampling error, then adding and subtracting the sampling error to the mean.

Table 5
Sampling Error of Work Travel Modes at the Regional Level (95% confidence level)

	Region	N	Auto	Non-Auto	Sampling Error
	New York	4781	55.6%	44.4%	+/- 1.42%
	New Jersey	3860	85.5%	14.5%	+/- 1.12%

Base: All weekday trips with work trip purpose, unweighted.
Based on binomial distribution of travel modes (auto vs. non-auto) expressed in percentages.
Note: The confidence interval is calculated by adding and subtracting the sampling error to the distribution.

Table 6
Sampling Error of Work Travel Modes at the County Level (90% confidence level)

FIPS Code	County	N	Auto	Non-Auto	Sampling Error
9001	Fairfield, CT	182	85.7%	14.3%	+/- 5.08%
9009	New Haven, CT	112	95.5%	4.5%	+/- 3.82%
34003	Bergen, NJ	511	80.8%	19.2%	+/- 3.41%
34013	Essex, NJ	291	75.6%	24.4%	+/- 4.93%
34017	Hudson, NJ	295	54.9%	45.1%	+/- 5.68%
34019	Hunterdon, NJ	230	91.7%	8.3%	+/- 3.56%
34021	Mercer, NJ	305	89.2%	10.8%	+/- 3.49%
34023	Middlesex, NJ	330	86.7%	13.3%	+/- 3.67%
34025	Monmouth, NJ	321	86.6%	13.4%	+/- 3.73%
34027	Morris, NJ	295	91.5%	8.5%	+/- 3.18%
34029	Ocean, NJ	171	92.4%	7.6%	+/- 3.97%
34031	Passaic, NJ	185	88.6%	11.4%	+/- 4.57%
34035	Somerset, NJ	193	95.3%	4.7%	+/- 2.97%
34037	Sussex, NJ	217	98.6%	1.4%	+/- 1.55%
34039	Union, NJ	207	82.6%	17.4%	+/- 5.16%
34041	Warren, NJ	255	98.8%	1.2%	+/- 1.32%
36005	Bronx, NY	191	35.6%	64.4%	+/- 6.79%
36027	Dutchess, NY	217	92.2%	7.8%	+/- 3.58%
36047	Kings, NY	395	30.1%	69.9%	+/- 4.52%
36059	Nassau, NY	352	74.1%	25.9%	+/- 4.57%
36061	New York, NY	1068	7.8%	92.2%	+/- 1.61%
36071	Orange, NY	228	86.8%	13.2%	+/- 4.39%
36079	Putnam, NY	178	85.4%	14.6%	+/- 5.19%
36081	Queens, NY	235	41.3%	58.7%	+/- 6.29%
36085	Richmond, NY	581	62.5%	37.5%	+/- 3.94%
36087	Rockland, NY	219	88.1%	11.9%	+/- 4.28%
36103	Suffolk, NY	446	90.8%	9.2%	+/- 2.68%
36119	Westchester, NY	300	71.0%	29.0%	+/- 5.13%

Base: All weekday trips with work trip purpose, unweighted.
Based on binomial distribution of travel modes (auto vs. non-auto) expressed in percentages.
Note: The confidence interval is calculated by adding and subtracting the sampling error to the distribution.

Table 7
Sampling Error of Travel Time to Work at the Regional Level (95% confidence level)

Region	N	Mean	Confidence Level Factor	Standard Error of the Mean	Sampling Error	Confidence Interval	
						Lower Bound	Upper Bound
New York	4781	31.97	1.96	0.49	+/- 0.96	31.02	32.92
New Jersey	3860	28.93	1.96	0.55	+/- 1.08	27.86	30.00

Base: All weekday trips with a work trip purpose, unweighted.
Note: The confidence interval is calculated by first multiplying the standard error of the mean by the confidence level factor to determine the sampling error, then adding and subtracting the sampling error to the mean.

Table 8
Sampling Error of Travel Time to Work at the County Level (90% confidence level)

FIPS Code	County	N	Mean	Confidence Level Factor	Standard Error of the Mean	Sampling Error	Confidence Interval	
							Lower Bound	Upper Bound
9001	Fairfield, CT	183	23.88	1.645	1.79	+/- 2.94	20.93	26.84
9009	New Haven, CT	112	20.88	1.645	1.96	+/- 3.22	17.63	24.14
34003	Bergen, NJ	514	25.79	1.645	0.98	+/- 1.61	24.18	27.40
34013	Essex, NJ	293	30.43	1.645	3.13	+/- 5.15	25.26	35.60
34017	Hudson, NJ	302	30.60	1.645	1.67	+/- 2.75	27.85	33.35
34019	Hunterdon, NJ	230	30.51	1.645	2.58	+/- 4.24	26.25	34.78
34021	Mercer, NJ	310	25.09	1.645	1.39	+/- 2.29	22.80	27.37
34023	Middlesex, NJ	337	28.66	1.645	1.53	+/- 2.52	26.14	31.18
34025	Monmouth, NJ	328	32.38	1.645	1.89	+/- 3.11	29.26	35.49
34027	Morris, NJ	296	27.81	1.645	1.64	+/- 2.70	25.11	30.52
34029	Ocean, NJ	174	29.46	1.645	2.42	+/- 3.98	25.45	33.46
34031	Passaic, NJ	187	26.99	1.645	1.62	+/- 2.66	24.32	29.66
34035	Somerset, NJ	195	24.02	1.645	1.36	+/- 2.24	21.77	26.26
34037	Sussex, NJ	220	31.04	1.645	2.26	+/- 3.72	27.30	34.77
34039	Union, NJ	212	31.13	1.645	4.05	+/- 6.66	24.43	37.82
34041	Warren, NJ	262	33.24	1.645	2.22	+/- 3.65	29.57	36.90
36005	Bronx, NY	197	40.45	1.645	2.06	+/- 3.39	37.05	43.85
36027	Dutchess, NY	220	24.44	1.645	1.83	+/- 3.01	21.42	27.46
36047	Kings, NY	405	41.74	1.645	1.49	+/- 2.45	39.27	44.20

36059	Nassau, NY	358	34.94	1.645	2.40	+/- 3.95	30.97	38.90
36061	New York, NY	1078	27.38	1.645	0.94	+/- 1.55	25.84	28.92
36071	Orange, NY	230	28.14	1.645	2.05	+/- 3.37	24.76	31.52
36079	Putnam, NY	181	38.71	1.645	2.82	+/- 4.64	34.05	43.38
36081	Queens, NY	237	38.59	1.645	2.07	+/- 3.41	35.18	42.00
36085	Richmond, NY	595	37.07	1.645	1.25	+/- 2.06	35.01	39.14
36087	Rockland, NY	223	30.74	1.645	2.39	+/- 3.93	26.80	34.69
36103	Suffolk, NY	457	28.41	1.645	1.34	+/- 2.20	26.21	30.62
36119	Westchester, NY	305	31.10	1.645	2.76	+/- 4.54	26.55	35.65

Base: All weekday trips with a work trip purpose, unweighted.
Note: The confidence interval is calculated by first multiplying the standard error of the mean by the confidence level factor to determine the sampling error, then adding and subtracting the sampling error to the mean.

Table 9
Sampling Error of Household Vehicles at the Regional Level (95% confidence level)

Region	N	Mean	Confidence Level Factor	Standard Error of the Mean	Sampling Error	Confidence Interval	
						Lower Bound	Upper Bound
New York	6021	1.31	1.96	0.0154	+/- 0.03	1.28	1.34
New Jersey	4950	1.84	1.96	0.0163	+/- 0.03	1.81	1.87

Base: All weekday households, unweighted.
Note: The confidence interval is calculated by first multiplying the standard error of the mean by the confidence level factor to determine the sampling error, then adding and subtracting the sampling error to the mean.

Table 10
Sampling Error of Household Vehicles at the County Level (90% confidence level)

FIPS Code	County	N	Mean	Confidence Level Factor	Standard Error of the Mean	Sampling Error	Confidence Interval	
							Lower Bound	Upper Bound
9001	Fairfield, CT	270	2.04	1.645	0.0706	+/- 0.12	1.92	2.15
9009	New Haven, CT	160	1.78	1.645	0.0735	+/- 0.12	1.66	1.90
34003	Bergen, NJ	643	1.83	1.645	0.0445	+/- 0.07	1.75	1.90
34013	Essex, NJ	418	1.44	1.645	0.0536	+/- 0.08	1.35	1.53
34017	Hudson, NJ	489	1.15	1.645	0.0440	+/- 0.07	1.08	1.22
34019	Hunterdon, NJ	276	2.41	1.645	0.0678	+/- 0.12	2.30	2.52
34021	Mercer, NJ	409	1.86	1.645	0.0531	+/- 0.08	1.77	1.95
34023	Middlesex, NJ	376	1.86	1.645	0.0544	+/- 0.08	1.77	1.95
34025	Monmouth, NJ	433	1.91	1.645	0.0526	+/- 0.08	1.82	1.99
34027	Morris, NJ	288	2.11	1.645	0.0643	+/- 0.10	2.00	2.21
34029	Ocean, NJ	269	1.89	1.645	0.0815	+/- 0.13	1.75	2.02
34031	Passaic, NJ	275	1.73	1.645	0.0606	+/- 0.10	1.63	1.83
34035	Somerset, NJ	266	2.03	1.645	0.0656	+/- 0.12	1.92	2.14
34037	Sussex, NJ	277	2.26	1.645	0.0725	+/- 0.12	2.14	2.38
34039	Union, NJ	260	1.90	1.645	0.0691	+/- 0.12	1.79	2.01
34041	Warren, NJ	271	2.08	1.645	0.0673	+/- 0.12	1.97	2.19
36005	Bronx, NY	271	0.70	1.645	0.0549	+/- 0.08	0.61	0.79
36027	Dutchess, NY	275	2.08	1.645	0.0752	+/- 0.13	1.96	2.20
36047	Kings, NY	489	0.75	1.645	0.0387	+/- 0.07	0.68	0.81

36059	Nassau, NY	384	1.90	1.645	0.0530	+/- 0.08	1.81	1.99
36061	New York, NY	1548	0.38	1.645	0.0168	+/- 0.03	0.35	0.41
36071	Orange, NY	270	2.03	1.645	0.0726	+/- 0.12	1.91	2.15
36079	Putnam, NY	261	2.21	1.645	0.0762	+/- 0.13	2.09	2.34
36081	Queens, NY	276	1.03	1.645	0.0539	+/- 0.08	0.94	1.11
36085	Richmond, NY	813	1.47	1.645	0.0346	+/- 0.05	1.41	1.53
36087	Rockland, NY	250	2.07	1.645	0.0751	+/- 0.13	1.95	2.20
36103	Suffolk, NY	432	2.07	1.645	0.0520	+/- 0.08	1.99	2.16
36119	Westchester, NY	322	1.78	1.645	0.0623	+/- 0.10	1.68	1.89

Base: All weekday households, unweighted.

Note: The confidence interval is calculated by first multiplying the standard error of the mean by the confidence level factor to determine the sampling error, then adding and subtracting the sampling error to the mean.

Table 11
Sampling Error of Household Trips at the Regional Level (95% confidence level)

Region	N	Mean	Confidence Level Factor	Standard Error of the Mean	Sampling Error	Confidence Interval	
						Lower Bound	Upper Bound
New York	6021	7.81	1.96	0.0867	+/- 0.17	7.64	7.98
New Jersey	4950	8.40	1.96	0.1000	+/- 0.20	8.20	8.60

Base: All weekday households, unweighted.
Note: The confidence interval is calculated by first multiplying the standard error of the mean by the confidence level factor to determine the sampling error, then adding and subtracting the sampling error to the mean.

Table 12
Sampling Error of Household Trips at the County Level (90% confidence level)

FIPS Code	County	N	Mean	Confidence Level Factor	Standard Error of the Mean	Sampling Error	Confidence Interval	
							Lower Bound	Upper Bound
9001	Fairfield, CT	270	8.53	1.645	0.40	+/- 0.66	7.87	9.20
9009	New Haven, CT	160	7.40	1.645	0.52	+/- 0.86	6.54	8.26
34003	Bergen, NJ	643	8.72	1.645	0.30	+/- 0.49	8.22	9.21
34013	Essex, NJ	418	7.46	1.645	0.33	+/- 0.54	6.92	8.01
34017	Hudson, NJ	489	6.62	1.645	0.27	+/- 0.44	6.18	7.06
34019	Hunterdon, NJ	276	9.07	1.645	0.43	+/- 0.71	8.36	9.77
34021	Mercer, NJ	409	8.65	1.645	0.37	+/- 0.61	8.04	9.25
34023	Middlesex, NJ	376	8.36	1.645	0.35	+/- 0.58	7.78	8.94
34025	Monmouth, NJ	433	9.18	1.645	0.36	+/- 0.59	8.58	9.77
34027	Morris, NJ	288	9.44	1.645	0.48	+/- 0.79	8.66	10.23
34029	Ocean, NJ	269	7.14	1.645	0.41	+/- 0.67	6.47	7.82
34031	Passaic, NJ	275	7.85	1.645	0.45	+/- 0.74	7.12	8.59
34035	Somerset, NJ	266	9.00	1.645	0.46	+/- 0.76	8.25	9.76
34037	Sussex, NJ	277	9.35	1.645	0.44	+/- 0.72	8.63	10.08
34039	Union, NJ	260	8.98	1.645	0.46	+/- 0.76	8.23	9.73
34041	Warren, NJ	271	8.65	1.645	0.47	+/- 0.77	7.88	9.43
36005	Bronx, NY	271	6.66	1.645	0.36	+/- 0.59	6.07	7.26
36027	Dutchess, NY	275	9.28	1.645	0.44	+/- 0.72	8.56	10.01
3604	Kings, NY	489	7.07	1.645	0.28	+/- 0.46	6.60	7.53

7								
36059	Nassau, NY	384	8.86	1.645	0.36	+/- 0.59	8.27	9.45
36061	New York, NY	1548	6.19	1.645	0.13	+/- 0.21	5.98	6.40
36071	Orange, NY	270	9.66	1.645	0.50	+/- 0.82	8.83	10.49
36079	Putnam, NY	261	9.30	1.645	0.50	+/- 0.82	8.47	10.12
36081	Queens, NY	276	7.25	1.645	0.40	+/- 0.66	6.59	7.92
36085	Richmond, NY	813	7.83	1.645	0.24	+/- 0.39	7.43	8.22
36087	Rockland, NY	250	9.20	1.645	0.45	+/- 0.74	8.47	9.94
36103	Suffolk, NY	432	9.64	1.645	0.37	+/- 0.61	9.02	10.25
36119	Westchester, NY	322	8.89	1.645	0.43	+/- 0.71	8.18	9.61

Base: All weekday households, unweighted.
Note: The confidence interval is calculated by first multiplying the standard error of the mean by the confidence level factor to determine the sampling error, then adding and subtracting the sampling error to the mean.

Table 13
Sampling Error of Work Location at the Regional Level (95% confidence level)

Region	N	Manhattan	Non-Manhattan	Sampling Error
New York	4781	36.9%	63.1%	+/- 1.37%
New Jersey	3860	8.9%	91.1%	+/- 0.90%

Base: All weekday trips with work trip purpose, unweighted.
Based on binomial distribution of work location (Manhattan vs. non-Manhattan) expressed in percentages.
Note: The confidence interval is calculated by adding and subtracting the sampling error to the distribution.

Table 14
Sampling Error of Work Location at the County Level (90% confidence level)

FIPS Code	County	N	Manhattan	Non-Manhattan	Sampling Error
9001	Fairfield, CT	183	10.9%	89.1%	+/- 4.52%
9009	New Haven, CT	112	1.8%	98.2%	+/- 2.45%
34003	Bergen, NJ	514	18.7%	81.3%	+/- 3.37%
34013	Essex, NJ	293	9.2%	90.8%	+/- 3.31%
34017	Hudson, NJ	302	24.5%	75.5%	+/- 4.85%
34019	Hunterdon, NJ	230	2.6%	97.4%	+/- 2.06%
34021	Mercer, NJ	310	4.2%	95.8%	+/- 2.23%
34023	Middlesex, NJ	337	8.0%	92.0%	+/- 2.90%
34025	Monmouth, NJ	328	12.5%	87.5%	+/- 3.58%
34027	Morris, NJ	296	4.4%	95.6%	+/- 2.33%
34029	Ocean, NJ	174	57.5%	42.5%	+/- 7.35%
34031	Passaic, NJ	187	7.0%	93.0%	+/- 3.65%
34035	Somerset, NJ	195	51.3%	48.7%	+/- 7.02%
34037	Sussex, NJ	220	45.5%	54.5%	+/- 6.58%
34039	Union, NJ	212	11.8%	88.2%	+/- 4.34%
34041	Warren, NJ	262	1.5%	98.5%	+/- 1.48%
36005	Bronx, NY	197	42.6%	57.4%	+/- 6.91%
36027	Dutchess, NY	220	1.8%	98.2%	+/- 1.77%
36047	Kings, NY	405	47.4%	52.6%	+/- 4.86%
36059	Nassau, NY	358	22.9%	77.1%	+/- 4.35%
36061	New York, NY	1078	85.3%	14.7%	+/- 2.11%
36071	Orange, NY	230	7.0%	93.0%	+/- 3.29%
36079	Putnam, NY	181	8.3%	91.7%	+/- 4.02%
36081	Queens, NY	237	51.5%	48.5%	+/- 6.36%
36085	Richmond, NY	595	30.1%	69.9%	+/- 3.69%
36087	Rockland, NY	223	11.7%	88.3%	+/- 4.21%
36103	Suffolk, NY	457	6.8%	93.2%	+/- 2.31%
36119	Westchester, NY	305	23.0%	77.0%	+/- 4.72%

Base: All weekday trips with work trip purpose, unweighted.
Based on binomial distribution of work location (Manhattan vs. non-Manhattan) expressed in percentages.
Note: The confidence interval is calculated by adding and subtracting the sampling error to the distribution.