



RT-HIS
**Regional Travel -
Household Interview Survey**

GENERAL FINAL REPORT

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



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

February 2000

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for the
**RT-HIS: REGIONAL TRAVEL -
HOUSEHOLD INTERVIEW SURVEY**

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New York Metropolitan Transportation Council
and the
North Jersey Transportation Planning Authority, Inc.

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NYMTC Transportation Models and Data Initiative: Task 12.6
NJTPA Regional Household Interview Survey: NJTPA Component

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Section 1.0 - Introduction

The *RT-HIS*: Overview

This report documents the design, implementation, and results of the 1997/1998 Regional Travel - Regional Travel Household Interview Survey (*RT-HIS*) conducted in the 28 county New York-New Jersey-Connecticut metropolitan area, including 12 counties in New York, 14 counties in New Jersey, and 2 counties in Connecticut.

The *RT-HIS* was conducted for the New York Metropolitan Transportation Council (NYMTC) and the North Jersey Transportation Planning Authority (NJTPA), the area's major Metropolitan Planning Organizations (MPOs), to develop transportation data and travel forecasting models for their respective regions. A major component of the Transportation Models and Data Initiative, the *RT-HIS* is supporting the Best Practice Models (BPM) being developed for NYMTC. It will also support the improvement of North Jersey Regional Transportation Model (NJRTM) used for major capital planning decisions and air quality analyses at the NJTPA, and provide significant information about travel at the county level.

New Jersey Transit also participated in the *RT-HIS*, sponsoring the inclusion of Mercer County, New Jersey. In addition, the core area surveyed was supplemented to include New Haven county, Connecticut, at the request of the Metropolitan Transportation Authority (MTA).

The prime consultant for the project was Parsons Brinckerhoff, New York, also the leader of the consultant team for the NYMTC Best Practice Model development project. The survey task leader was NuStats International, Austin, Texas.

Data collection began in February of 1997 and continued through May of 1998. The *RT-HIS* was diary type survey travel survey, in which detailed travel information for each member of participating households was collected during an entire travel day. This includes the specific time, location, and mode of travel for all household members during the travel day, as well as their activities at each place to which they traveled. In addition, basic demographic, employment and other data about each household and each person in the household was collected in the *RT-HIS*.

The selection, recruiting and collecting the *RT-HIS* data from each household was an eight staged process, involving a series of mailings and telephone interviews and follow-up contacts.

These procedures are summarized in the chart below:

Survey Step	Highlight / Feature
<ul style="list-style-type: none"> ❑ Household selected ❑ Letter of Introduction mailed ❑ Recruitment interview conducted (by telephone) ❑ Travel Diaries received for each person ❑ Assigned Travel Day ❑ Retrieval interview(s) conducted ❑ Data checking and control ❑ Geocoding of all locations 	<ul style="list-style-type: none"> ❑ Random Digit Dialing (RDD)-based sample ❑ From NYMTC/NJTPA with \$1 ❑ CATI*: Household & Person profiles, work/ school info, assign travel day ❑ Diaries, with \$1 per person, Hot Line and instructions ❑ Reminder call before / verify info. ❑ PATI*: report diary info with probes ❑ Edit Checks, geo-coding and call-backs ❑ Point (Long/Lat) location of places visited (trip ends)

Note: CATI – Computer Assisted Telephone Interview procedure.

PATI – Paper Assisted Telephone Interview procedure.

The *RT-HIS* data set consists of complete and usable travel information collected from a sample of 11,264 households. The sample for analysis of resident-based weekday travel is 10,971 for the entire 28 county Metro Area. The weekend sample, it is comprised of 275 households, restricted to the NJTPA counties.

1.2 Organization of this Report

Section 1 reviews the objectives of the *RT-HIS*, gives an overview of other travel surveys used in formulating the *RT-HIS*, and explains the documentation of the survey. Section 2 follows the development of the sampling plan and interview process, and also explains the methods of data processing. Implementation of the survey, including the characteristics of the achieved sample and the necessary adjustments made throughout the sampling process are addressed in Section 3. The principal results of the *RT-HIS* are reported in Section 4, in a series of tables and graphics developed from tabulations of the weekday survey data. In this main section of the report, basic descriptive tabulations of the results are presented, focused on the following general topics of interest for regional transportation and travel behavior.

- ❑ General Travel Patterns and Trip Rates
- ❑ Mode of Travel Shares
- ❑ Purpose of Travel
- ❑ Time of Day / Day of Week
- ❑ Household Structure and Travel
- ❑ Vehicle Ownership
- ❑ Trip Distance, Times and Speeds
- ❑ Auto Trips and Vehicle Occupancy
- ❑ Transit Trips
- ❑ Taxi and Other Shared Ride
- ❑ Walk and Other Non-Motorized

The key *RT-HIS* survey materials are located in the Appendices, including a facsimile of the Diary Form used by respondents to keep track of the travel they reported in the survey.

1.3 Objectives of Survey

The purpose of the *RT-HIS* is to provide information suitable for gaining an in-depth understanding of the travel behavior of households and individuals within households, and the activities, demographic and other factors that affect it. The resulting data resource enables planning agencies to update and enhance travel forecasting tools and analysis procedures and, more generally, serves as a foundation for transportation planning and investment decision-making. The data set was specifically designed to provide a rich source of information for use in the NYMTC BPM effort and the NJTPA's NJRTM enhancement. It was also designed to produce reliable measures of general weekday travel parameters at the county level, for groups of counties, for MPO regions, and for the metropolitan area as a whole. Weekend information, a small part of the survey collection for New Jersey, complements nationally available data to provide regional weekend measures of travel.

The *RT-HIS* was designed to collect regional travel behavior that would serve two objectives:

- ❑ **To Support Development of Travel Demand Forecasting:** The content of the data to be collected in the *RT-HIS* was primarily determined by identification of the data needed to develop the NYMTC Best Practice Model (BPM). The principal application of the *RT-HIS* data was for the estimation ("disaggregate" or individual-based) of travel behavior choice models that comprise the BPM travel forecasting system. The data will also be applied to validating and enhancing the NJRTM.
- ❑ **For General Reporting of Travel Estimates:** The last area-wide detailed survey of household travel was done over thirty years ago for the Tri-State Regional Council in 1963. A Northern New Jersey-focused survey was conducted in 1986 for the original NJRTM development. It was essential that the *RT-HIS* adequately provide current estimates for a range of travel measures that are of interest to regional transportation planners, and to

ensure that it would be possible to produce reliable estimates from the survey data for the overall region, and for each of its member counties (in other words “aggregate” reporting).

It is anticipated that the *RT-HIS* data will be a valuable resource for many years to support in-depth study of a wide range of travel issues of interest to NYMTCTPA and other agencies responsible for transportation planning in the metropolitan area.

1.4 Regional Best Practice Model: Travel Forecasting

The Regional Travel Household Interview Survey (*RT-HIS*) is an essential element in the Transportation Models and Data Initiative Project. This project is producing advanced 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/Connecticut metropolitan area .

In addition to supporting the NYMTC initiative, the *RT-HIS* data collection was designed to provide data needed for the update and validation of the North Jersey Regional Travel Models (NJTRM).

1.5 The *RT-HIS* and Other Travel Surveys and Databases

The *RH-HIS* is similar to and complements several other surveys or databases available to transportation analysts and planners in the region regarding detailed travel by the resident population. It was designed to both overcome the limitations of these other travel databases, while at the same time provide as much comparability as practical for cross-analysis and validation.

- Census Transportation Planning Package (CTPP): This is the “journey-to-work” data obtained in the decennial census of population. Every ten years, it provides transportation planners with data about the characteristics of workers, their workplaces, and their “usual” travel between home and work. Its strength is that it is based on a very large sample (“15% “long form”) of households, with minimal non-response problems. The most significant shortcoming of the 1990 CTPP addressed by the *RT-HIS* is that Census travel data is for work travel only, and then for only the “primary” job that respondents worked at in the week prior to the census. Also, since the Census 2000 data will not be available for a number of years yet, the *RT-HIS* provides a more current profile of travel in the region than available from the 1990 Census data.
- Nationwide Personal Transportation Survey (NPTS): Unlike the CTPP data, but like the *RT-HIS*, the NPTS includes data for all travel by households, not just work travel. The most recent NPTS was conducted in 1995, with NYTMC participating in the “over sample”

program, yielding a larger sample of households from the New York counties of the metro region than would have been found in the national sample. Connecticut and New Jersey counties in the region, however, were not augmented. Consequently, the sample size does not support reliable statistics for most counties in the region. More importantly for model development needs, the regional NPTS data does not provide precise locational data (“geocoding”) for travel origins and destinations, and lacks many of the detailed mode and other specific trip characteristics needed to develop the BPM. It should be noted, that the NPTS data includes weekend as well as weekday travel. Because of this, and due to the focus on weekday travel for the BPM, it was decided to only collect weekend travel data from a relatively small sample of households in the *RT-HIS*, only in New Jersey, to supplement the information on weekend travel that is available from the NPTS.

- NJDOT: North Jersey Household Travel Survey. Similar in many respects to the *RT-HIS*, this was a travel diary survey collected in 1986 in the 12 counties of northern New Jersey. It has been used by NJTPA and NJDOT to develop the current set of NJTRM travel forecasting models.
- MTA: Comprehensive Total Travel Survey (CTTS): This was a household travel survey conducted by the MTA in 1989 for use in transit ridership analysis and forecasting in the MTA service area. The *RT-HIS* was planned and implemented to provide a similar profile of household travel measures and patterns, only to be more current and geographically comprehensive, and with a sampling approach designed to support regional analysis.

1.6 *RT-HIS* Reports and Documentation

Final reporting of the *RT-HIS* methods and results are available in seven separate, but modular components intended to address the interests and needs of three main audiences:

- **Audience A:** Policy makers, decision-makers, boards, technical advisory committees, etc. whose interest in the project is what answers the *RT-HIS* survey data can tell them or what information it can provide in response to local or regional transportation issues.
- **Audience B:** Transportation professionals in the study region or involved in similar studies across the U.S. whose interest in the project is the survey’s role supporting an enhanced Best Practice Regional Travel Demand Model.
- **Audience C:** NYMTC/NJTPA staff , project team members, consultants and who will be using the data for modeling purposes as well as to answer other regional transportation questions.

The ***RT-HIS* General Final Report**, is intended to serve as the primary *RT-HIS* comprehensive document for general distribution. The primary audience for this report is **Audience B**. As the principal *RT-HIS* final report, this document recaps the essential information provided in the other *RT-HIS* reports with regard to survey planning and implementation experience. The discussion in this report focuses on estimated measures of regional and sub-regional travel, with an analysis of key travel patterns of general interest to travel demand model developers, as well as general transportation planners.

Six additional reports are available to the interested reader or *RT-HIS* data user from either NYMTC or NJTPA. A brief description of each of these supplemental reports follows.

1. ***RT-HIS Users Manual***. This component is focused towards **Audience C** (current and future users of the data set) and addresses methodology, data strengths and weaknesses, instructions for proper application of data weights as well as control totals to confirm the data are used properly, and other detailed information that would facilitate proper use of the data. It provides guidance for data distribution policies that would conform to confidentiality requirements. Contents also include SPSS and SAS programs to produce key tables and as well as instructions for comparing the results to other data sets such as the NPTS and Census.
2. ***RT-HIS Methods and Implementation***. Its main focus is for **Audience B**, although it can be distributed to the other audiences upon request. This component documents survey methods, interviewing outcomes, response rates and notable events. It also provides an assessment of survey data item reliability and applicability for model development. The creation of the sample weights and balancing factors are also addressed here. Survey instruments and materials appear in an appendix to this report.
3. ***RT-HIS Compendium of Results***. Its main focus is for **Audience B**, although it can still be distributed to the other audiences upon request. Its focus is on the results of the survey as represented by a substantial set of tables with appropriate, explanatory footnotes. The document layout is such that any table could be “pulled” from the report and contain all necessary information and documentation about its contents so that it can essentially “stand alone.”
4. ***RT-HIS Presentation Material***. This Power Point presentation’s main focus is for **Audience A** and it is anticipated to have the widest possible distribution. This component is a brief, pictorial presentation of the data that contains highlights of the data collection effort and focuses on the main characteristics of the data set. The content is geared to the policy makers and other officials who won’t necessarily use the data themselves directly, but should be aware of the data set and its capabilities.
5. ***RT-HIS: Comparative Analysis: Weekday and Weekend Travel Analysis***. This report provides a special analysis of weekend travel in the region. It is based on a small sample of *RT-HIS* households in New Jersey (252), supplemented by the 1995 Nationwide Personal Transportation Survey (NPTS) data that was obtained by NYMTC through the “over-sample” program. As a special report, this includes additional data processing and

organizations, may reference in doing special research with this important database over the next several years. Guidance will be provided with respect to important special topics, determined in consultation with NYMTC and NJTPA to be of special interest to regional transportation planning agencies. The main focus of this report is for **Audience A**.

1.7 Availability of *RT-HIS* Data Products

In addition to the series of *RT-HIS* reports described above, the data collected and processed in this effort is available to NYMTC and NJTPA member agencies, transportation analysts and other interested persons. Confidentiality requirements will be addressed as the form of distributed data sets and any required licensing is determined.

Data Files

As described in the **Users Guide**, the *RT-HIS* resides in six relational database data files:

- ❑ Household - basic data about each household in sample: 11,264 households total (10,971 weekday)
- ❑ Person - basic data about each person in sample: 27,369 persons (26,650 weekday)
- ❑ Place - all places visited (traveled to), including place at 3:00 am (usually Home) and the last place of day: 118,134 places (115,238 weekday)
- ❑ Vehicle - all vehicles owned or available to households in sample: 17, 517 vehicles
- ❑ Location - file of all unique locations (Longitude/Latitude geocoded) associated with the places reported: 55,349 locations.
- ❑ Audit File - one record for each trip record with information (“data quality / processing flags”) documenting data edits, cleaning and any imputation done to the data record.

These contents and formats of these files are documented in the Users Guide. They are available in ASCII, DBF or SPSS format.

Data Analysis Procedures

In addition to these basic data files, the consultant team has developed automated procedures or scripts (SPSS Syntax Files) that have been used to:

- ❑ combine these files for analysis, e.g. construct a “trip” file from the “place” file , with origins and destinations on each trip record;
- ❑ develop general travel measures from the specific respondent provided data, e.g. “trip purpose” or “general model of travel”;
- ❑ re-code the data to standard consistent groupings, e.g. age ranges / cohorts;
- ❑ calculate and apply *RT-HIS* weights; and,

- produce a standard set of tabulations of the *RT-HIS* data, such as cross-tabulations and mean average estimates for tabular and graphic presentation of the results.

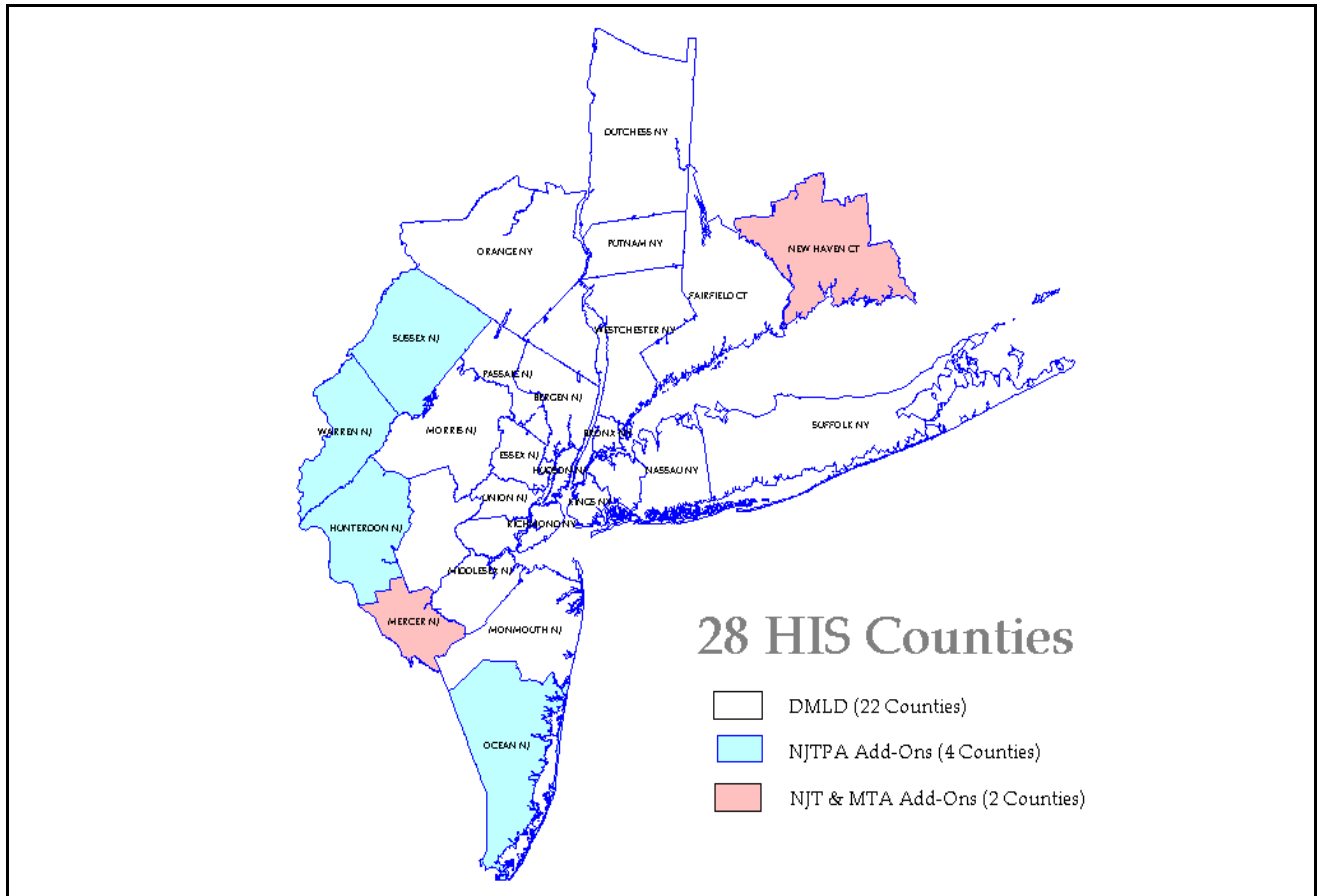
Section 2.0 - Survey Planning and Approach

2.1 Metropolitan Study Area

All households within the 28 counties comprising the New York/New Jersey/Connecticut metropolitan area (see Figure 1) were eligible for inclusion in the study through a random sampling process. These counties included:

- New York: Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Westchester
- New Jersey: Bergen, Essex, Hudson, Hunterdon, Mercer, Middlesex, Monmouth, Morris, Ocean, Passaic, Somerset, Sussex, Union, Warren
- Connecticut: Fairfield, New Haven

Figure 1 The RT-HIS Study Area



* NOTE: DMLD – Density / Model Leadership District (for sampling)

2.2 Data Requirements and Survey Content

As indicated in Section 1.3: Objectives of Survey, the *RT-HIS* was designed to collect information about regional travel behavior that would serve two objectives: support the development of the Best Practice Model (BPM) travel forecasting models, and to allow for general analysis and reporting of regional travel statistics.

The specific data items to be collected were determined by the consultant, NYMTC and NJTPA over the course of planning for the *RT-HIS* based on the following considerations:

- ❑ Review of the adequacy and limitations of available data on current household travel in the region (See Section 1.6)
- ❑ Identification of the full range of specific data items that could contribute to the estimation of the BPM
- ❑ Consideration of “respondent burden,” with an aim to minimize the extent of the information each participant must report, the length of each interview, and the avoidance of intrusive or sensitive questions that would yield poor response.

A “Data Items Matrix” was developed and used as the focus for the decisions made leading to the final survey forms and procedures. Each item of information to be collected was precisely defined, and this listing was then used as the framework for *RT-HIS* survey planners to determine how each data items would be obtained or verified, and in which of the administration cycle stages of survey. The Data Items Matrix” is found in **Appendix B**.

It was determined that all locations reported within *RT-HIS* study area would be geo-coded to the specific Longitude / Latitude coordinates. This allowed for the GIS-based automatic coding of trip ends and other places in the *RT-HIS* to Census tract, NYMTC BPM zones, or other standard geographic analysis units used for planning in the region.

2.3 Sampling Plan

The purpose of the sampling design was to collect data from a sufficient number of households to ensure that accurate data were obtained. Sample design and selection were accomplished according to a plan developed by Cambridge Systematics, which included the following characteristics:

- ❑ Complete and accurate travel and activity information needed from approximately 11,000 households;
- ❑ Travel data collected for weekday travel (small weekend sample included);
- ❑ 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 employed, according to the concept of Density / Mode Leadership Districts (DMLD’s) developed for use in the study.

Random digital dial techniques generated a list of 52,390 listed and unlisted phone numbers. Using a strategy involving replicates, a sample was generated for each county separately, then combined into a master sample file. This total sample was then reassigned randomly into smaller independent samples called replicates. Each replicate was fully exhausted before another was made available to interviewers for data collection. This method is used to minimize response-bias associated with the degree of difficulty experienced in contacting and interviewing households.

As indicated previously, the *RT-HIS* was designed to collect regional travel behavior that would serve two objectives: 1) to support development of travel demand forecasting, and 2) for general reporting of travel estimates.

The content of the data to be collected in the *RT-HIS* was primarily determined by the data needed to develop the NYTMC Best Practice Model (BPM). The principal application of the *RT-HIS* data is for the estimation (“disaggregate”) of travel behavior choice models that comprise the BPM travel forecasting system. In addition, the sampling plan was developed and implemented to promote a “rich” sample of mode choice behavior and competing travel services. This was achieved by use of the “Density / Mode Leadership Districts” (DMLD’s) classification of sample households, based on a pre-survey analysis of the Census for Transportation Planning Package (CTPP) journey-to-work data.

The *RT-HIS* sampling plan also included measures to ensure that it would be possible to produce reliable estimates from the survey data for the overall region, and for each of its member counties, in other words, “aggregate” reporting. This objective required that a minimum size sample be obtained in each county, including those counties that were not “districted” as DMLD’s for the purposes of enhancing the sample for model development purposes.

Density / Mode Leadership District Sample Goals: The study area was evaluated in terms of population density, expressed in terms of very high, high, moderate, and low, and mode choice availability, expressed in terms of available modes for each region. When combined, the same mode could appear in several strata, based on population density. Refer to **Table 1**.

The distribution of trips by county varies widely, due not only to population differences among the counties, but also the expected information on mode choice that can be gathered by county.

As shown in the first column of

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

Table 2 the classification of Census tracts within the initial set of counties by DMLD’s resulted in a sample of 8,100 households that was designed to produce a robust data set for model estimation. Because the models are not directly based on jurisdictional geography, the level of sampling developed from the DMLD’s varied by county.

Minimum County Sample: As shown in the second column of

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

Table 2, the sample was augmented to ensure that a minimum sample of households be obtained in each county to support a specified minimum level of statistical reliability for the reporting of county-level statistics. This was established as 271 households to support a 90% level of confidence for a standard data item estimate within a plus or minus 10% range.

Assuming a coefficient of variation of 1.0 for trip generation for a specific purpose (consistent with most weekday estimates), the minimum sample size was calculated as follows:

$$\begin{aligned} \text{Sample size} &= (\text{coefficient of variation})^2(z)^2(\text{desired precision})^{-2} \\ &= (1.0)^2(1.645)^2(0.1)^{-2} \\ &= 271 \text{ households} \end{aligned}$$

For a more complete discussion of the statistical reliability of *RT-HIS* estimates, please see **Appendix E**.

Table 1
Survey Allocation Plan for Model Development

Model Sampling Cell				UNIFORM		RT-HIS 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%
Moderate	All Other	16	347,646	505	0.15%	300	0.09%
	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.

Table 2
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
Ocean*	0	271	271
Sussex*	0	271	271
Warren*	0	271	271
Mercer*	0	416	416
TOTAL	8104	2846	10950

Over the course of survey planning, six counties were added to the regional sample: New Haven, Hunterdon, Mercer, Ocean, Sussex, and Warren. These are shown in **Figure 1**.

While the data collected in these counties are being used to supplement the survey database supporting model development, it was not considered necessary to stratify the sampling within these counties by DMLD's. Consequently, they did not have any mode leadership strata and were only sampled at the county level.

The full sample plan is shown below in **Table 3**.

Table 3
Final Sampling Plan: Number of Households by County and Density/Mode Leadership District

	Density/Mode Leadership District															Total		
	1	2	3	11	12	13	14	15	16	21	22	23	24	31	32		33	35
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	1,479	-	70	-	-	-	-	106	-	-	-	-	-	-	-	-	-	1,655
Orange	-	-	-	-	-	-	-	22	-	-	59	-	-	-	61	71	59	272
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	433
Westchester	-	-	-	-	92	-	-	13	-	75	89	-	-	72	-	-	-	341
New Jersey Counties																		
Bergen	-	-	-	-	2	8	164	-	82	10	9	235	15	8	77	41	7	658
Essex	-	-	-	-	9	250	-	37	8	34	41	16	7	27	-	5	434	
Hudson	-	300	-	39	-	43	-	51	-	-	50	-	-	14	-	-	497	
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	402
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	-	-	272
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

2.4 Pilot Survey and Dress Rehearsal

Two smaller scope surveys were taken to refine the initial survey plan to the final plan implemented in 1997/1998. The first pilot, conducted in 1995, was used to correct any flaws prior to the actual large survey and to determine the efficacy of various incentives and methodologies. This pilot yielded several important improvements and information in the areas of recruitment, diary design and incentives, and data elements.

In 1996, a dress rehearsal was held to prepare for the full scale *RT-HIS* to be conducted the following year. Five sites, representative of the 28 county area, were chosen to test travel data retrieval. A total of 215 households participated in the two step rehearsal. In the first stage, retrieval of only one site resulted in modifications to the procedures and instruments, more detailed training for the interviewers, and further testing of mailing procedures. The final four

sites proved that household participation and retrieval rates were high and instruments and materials were adequate.

2.5 Description of Survey Interview Process

Data collection included an eight-stage process which began in February of 1997 and continued through May of 1998. The resulting data set consisted of complete and usable travel information for 11,264 households in the 28 county tri-state area. The following is a listing and description of each stage in the process:

1. **Advance Calls.** The sample generated for use in the study could be characterized in one of two groups: (a) those for which a geo-codable residential address can be produced because the phone number was listed, the address was complete and could be geocoded; and (b) those that do not have a geo-codable residential address because the number is out of service, is a suspected business or government entity, is unpublished, or is published but with an incomplete address. The numbers in category (a) do not receive an advance call and were immediately shifted into the next stage of the notification mailing, after geocoding of home address. In order to secure geo-codable mailing addresses for the randomly generated numbers in (b) above, advance calls were made to each number. Those identified as disconnects, business/ government or fax lines are deleted from the sample. If a residence is reached, the interviewers follow a carefully prepared script to explain the purpose of the study. At the conclusion of the short project description, the interviewers ask for an address in order to mail project information to the household.
2. **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 clearly 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, but tightly focused brochure was also included in the mailing to provide further details that cannot 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 cycle of mailing the advance packet was designed to assure delivery of the notification to all households that were called for recruitment, but to make this "advance" period as short a time as possible prior to the recruitment call.
3. **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. 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.

4. **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.
5. **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. If a household had not yet received their packet, they were re-assigned to a later date and a new packet was mailed.
6. **Data Retrieval Interview.** The day following the travel day (or at the specified call-back time), retrieval from the households began. 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. 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.

2.6 Data Processing

All surveys completed in a particular evening were entered the following day. Data processing was also conducted daily. The following are the procedures followed by the data entry and processing staff.

1. **Sample Management Procedures.** The first of the two sample files used tracked the outcomes of the nine contact attempts for each household. It's CATI file format was difficult to use, so a second master file was created in a format that was easy to access and manipulate. At the end of each recruitment shift, a program was run that took the CATI dispositions and updated the master sample file. The master file also contained the call outcomes for the retrieval sample. At the end of each day, data processing staff collected all retrieval samples and updated the dispositions in the master file.
2. **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 calling 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.
3. **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 corrected the information in the database. The data processing staff noted the specific changes made and kept all forms for backup documentation.

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

4. **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, and 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. This program is described in more detail in Appendix A. 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.
5. **Geocoding.** Electronic geographic coding (geocoding) converts written address information into x/y coordinates (latitude/longitude) and attaches zonal information (census tracts) for mapping, modeling, and planning purposes. Geocoding was a large component of the data processing required for the *RT-HIS*. Geocoding occurred at three distinct stages in the survey: home address geocoding (after advance calls), habitual address coding (after recruitment interview), and trip location geocoding (after retrieval). All geocoding was done using Arc View software. The coverage files included the New York City LION files and GDT (Geographic Data Technology) street coverage files. All 55,000 locations that fell within the 28-county area were geocoded to an exact longitude coordinate. NuStats' geocoding process is described in more detail in **Appendix D**.

Section 3.0 - Implementation of Survey

3.1 Schedule of Survey Implementation

Households were recruited and interviewed in three large groups beginning in February 1997 and ending in May 1998, more specifically Spring 1997, Fall 1997, and Spring 1998. Generally, when schools were in session, the survey was underway.

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. In total, 14,441 households were recruited to participate in the study. Of these, 11,264 households completed travel diaries, and the information was retrieved from all household members regardless of age.

3.2 Survey Implementation Resources and Management

As described in the Introduction, the *RT-HIS* was conducted under the sponsorship of the New York Metropolitan Transportation Council (NYMTC) and the North Jersey Transportation Planning Authority (NJTPA). The Prime Consultant for the project was Parsons Brinckerhoff, while the survey task leader was NuStats International.

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.

3.3 Adjustments to Survey Procedures

Two incentives were included in the *RT-HIS*: a cash incentive and a drawing for airline tickets. The use of cash incentives was tested during the 1996/1997 dress rehearsal. The incentives 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. All procedures (except for the inclusion of cash) were identical for all households included in the test.

The first stage of the incentives test was to determine the impact that the inclusion of an incentive would have on the recruitment process. To do so a total of 1,764 households were selected, 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 a pair of airline tickets. Each control group household also received the same magnet and the airline ticket drawing

information. The overall recruitment rate was 36.2%. In the control group (no incentive), the recruitment rate was 31.9% -- in other words, 32% of all households agreed to participate in the study. This compares to a 40.3% recruitment rate for the test group. Again the only difference between the two groups was the inclusion of \$1 in the test group mailing.

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 or 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 85.5%.

The overall response rate is a combination of the recruitment and retrieval rates. Overall, the response rate was 31.5% (36.2% times 87%). For the test group, the response rate was 40.3% times 88% or 35.5%. The control group had an overall response rate of 27.3% (31.9% times 85.5%).

No tracking was done to determine the impact of the ticket drawing on participation rates.

3.4 Achieved Sample

The final data set is comprised of 11,264 households that provided complete activity and travel information for a 24-hour period for each member. Of these 293 reflect weekend travel, 275 of which comprise the planned sample of weekend travel households in the 13 counties of the NJTPA planning region. The remaining 10,971 reflect weekday travel.

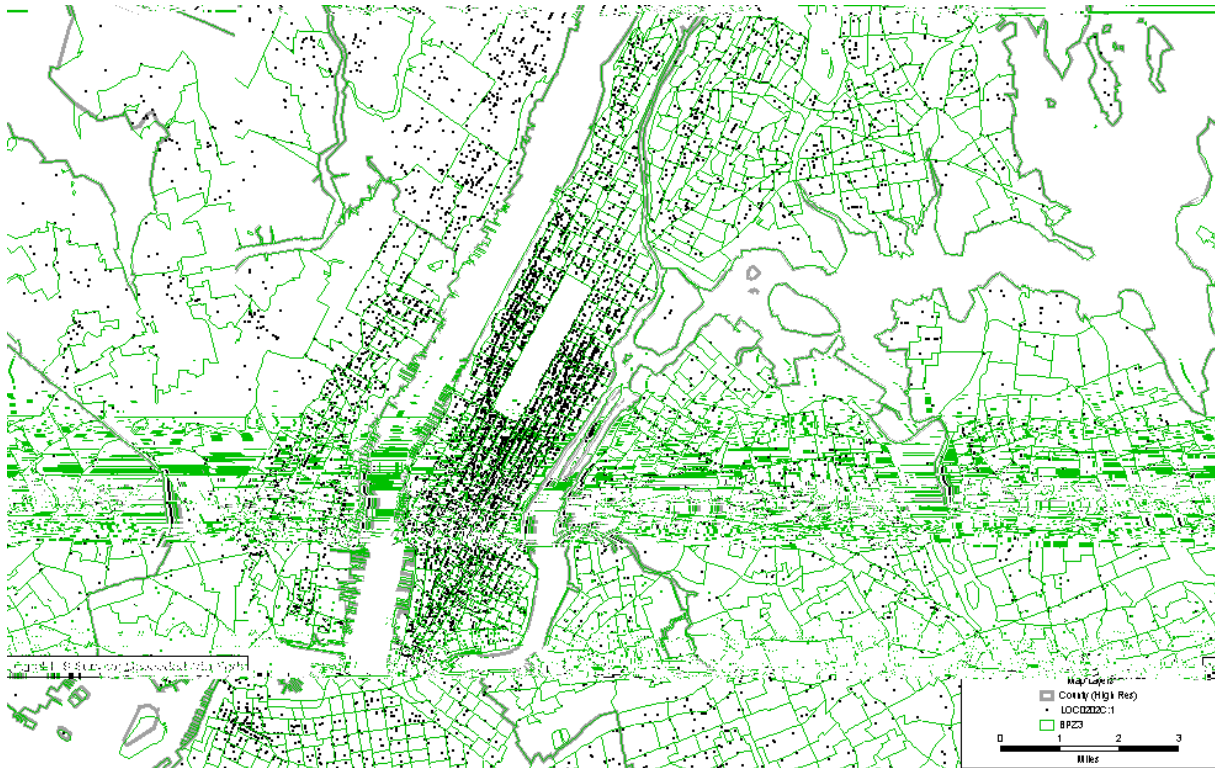
Table 3 displays the distribution of completed weekday household by County and Density / Mode Leadership District (DMLD) goals. The sampling objective was to obtain the total number of households by county specified, and by Density Mode Leadership District specified, but not for each Density Mode Leadership District within a specified county. Please see Table 1 (in Section 2.3) for a listing of these sampling districts.

Table 3
Actual Number of Weekday Households by County and Density/Mode Leadership District

County	Mode Leadership Density																	No MLD Defined	Total: All MLD's		
	1	2	3	11	12	13	14	15	16	21	22	23	24	31	32	33	35				
1 New York	1,166		270					112													1,548
2 Queens			134	142																	276
3 Bronx			172	99																	271
4 Kings			428	61																	489
5 Richmond							749								64						813
6 Nassau				4	160			24	29	71	37	10	8	24	1	7	9				384
7 Suffolk					7			1	20	54	13		141	50	2	33	111				432
8 Westchester					114			11		76	48				73						322
9 Rockland																250					250
10 Putnam															76			185			261
11 Orange								31				32				58	80	69			270
12 Dutchess												46		18			133	78			275
13 Fairfield									44	33			39	103	11			40			270
14 Bergen					2	9	137		95	12	10	214	23	18	70	34	19				643
15 Passaic									45	72		20	67			10	61				275
16 Hudson		142		188		56		63			27				13						489
17 Essex						232			52	11	30	30	23	11	22			7			418
18 Union					36				76	43				80	18	7					260
19 Morris										3	45	19	28	5	2	41	145				288
20 Somerset									17			31		44			5	169			266
21 Middlesex					8			41		36	9		50	13	152	49	18				376
22 Monmouth								15	5			103	26	43	59	89	43	50			433
23 Ocean																					269
24 Hunterdon																					276
25 Warren																					271
26 Sussex																					277
27 New Haven																					160
28 Mercer																					409
Total: All Counties	1,166	142	1,004	494	327	297	886	343	410	339	451	299	564	450	741	435	961	1,662			10,971

The map shown in **Figure 2** below illustrates the sample of *RT-HIS* household locations as geo-coded for the central portion of the area, including Manhattan, and parts of Brooklyn, Queens, and Hudson counties.

Figure 2 Geo-Coded Places in RT-HIS - New York City Detail



3.5 Response Rates

Response rates are calculated by analyzing the attrition at the three critical stages in the sampling process: contact, recruitment, and retrieval levels.

Contact Levels. **Table 4** below shows the various dispositions of the sample replicates. Those that resulted in disconnects, non-residentials (business, government), computer/fax lines, etc. were immediately eliminated from the eligible sample.

Table 4
RT-HIS Sample Dispositions

Dispositions	Count
Recruited Sample	14,441
Eligible Sample: Not recruited	28,495
Answering Machines	4937Bu(o)4.6y

- **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:** Complete person records for all members of household.
- **Definition of acceptable partial record:** Household, person, vehicle, and trip/activity information for all (n) household members who are employed, in school or day care, and there is complete activity for (n-1) members. The purpose of this definition is to provide a mechanism for retaining data from larger households in which a single person may not report travel/activity data. Thus, partial trip records will be accepted only for those households with four or more members.
- **Tolerance for acceptable household records:** Up to 5% of the 11,199 households are permitted to be partial records; at least 95% must be complete household records. A modification of this standard could be made to count a partial record (as defined above) as 50% of a complete record.
- **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:** Should be staged over several days. The households that require callbacks for data clarification will be identified within 48 hours of data retrieval, and final cleaned data will be available within one week of data retrieval. This provides a period for correcting or verifying illogical, incomplete data from respondents and errors from survey workers.
- **Tolerance for home address geocoding:** Must be successfully geocoded to x/y coordinates 100% of the time prior to sending out diary materials.
- **Tolerance for workplace and school geocoding:** Must be successfully geocoded to x/y coordinates 95% of the time to constitute complete information.
- **Tolerance for other trip geocoding:** Must be successfully geocoded to x/y coordinates 91% of the time, with remaining locations imputed to a reasonable location based on the context of available travel information.

These procedures and goals were generally fulfilled in the implementation of the *RT-HIS*, with some modifications made by the project team in the course of ongoing monitoring and consultation. A specific description of the achieved sample, geocoding, and other data quality issues is found in **Appendix F**.

Upon completion of the retrieval interview, the data were subjected to two edit checks. The first is termed a “field edit” and took place immediately after the interview was completed. Interviewers used a specially prepared form to ensure that key data items were verified. In addition, field supervisors performed an edit of each completed survey. 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. Most correction calls were made the same evening as the data retrieval interview. Additionally, all data were subjected to

PB's edit check program (**Appendix C**) to flag discrepancies, which were output into a file for corrections or verification.

3.7 Survey Sample Representativeness: Validation and Weighting

Weighting and validation of the data occurred in two stages; both are described in this section. Stage 1 Weights were initially used for all tabulations of survey results for the Draft reports produced as part of *RT-HIS* final reporting. Stage 2 weighting, or “balancing” have been applied to the data reported in this Final General Report, and for all other final versions of reports distributed for the *RT-HIS*.

3.7.1 Stage 1: Weighting of the Data for Analysis and Reporting

The Stage 1 weight is comprised of five elements that aim to adjust the weekday data to correct for the differential rates of sampling that occurred due to the sampling plan and because of telephone ownership patterns:

Factor 1: Probability of Selection in Sampling Plan. The study area is not homogeneous in terms of telephone ownership. Certain locations have very high levels of telephone ownership turnover and very differential rates of working telephone numbers, while others are much more stable and have higher rates of ownership and working rates. Therefore, FACTOR1 incorporates both the probability of selection weighting and the heterogeneity of counties in the study region by combining weighting with geographic balancing and using the actual number of completed households and the universe of households by county and Density Mode Leadership District (DMLD).

The following tables illustrate the factor calculation process for county and Density Mode Leadership District strata: the number of completed weekday households, the number of households in the universe, and the weighting factor that accounts for probability of selection.

- ❑ **Table 5** displays the actual number of households that completed the *RT-HIS* survey for the weekday travel day, distributed by DMLD's.
- ❑ **Table 6** contains the populations for each county and Density Mode Leadership District strata for the survey universe.
- ❑ **Table 7** contains the weighting factors that adjust for probability of selection.

To explain how these factors were developed, the process is illustrated for New York County, Density/Mode Leadership District 1.

- A. A total of 1167 households completed the *RT-HIS* in New York County, Density/Mode Leadership District 1, as displayed in **Table 5**.

- B. According to the 1996 estimate developed in the NYMTC Transportation Model and Data Initiative (Track 8) county total allocated by Density/Mode Leadership District, there were 458,749 households in New York County, Density/Mode Leadership District 1, as displayed in **Table 6**.
- C. Each cell in **Table 5** was converted to a percent of total. Although not shown, for the New York County, Density/Mode Leadership District 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 6** was converted to percent of total. Although not shown, for the New York County, Density/Mode Leadership District 1, 458,746 divided by 7,180,385 was 0.06389 or 6.39% of the total.
- E. In a perfect setting, 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 6.64% of the total population. To create the factor for New York County, Density/Mode Leadership District 1, the completed *RT-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 5 and 6.
- G. Since the weights were applied by county and Density/Mode Leadership District, weights were not calculated for the totals.

Table 5
Actual Number of Households by County and Density Mode Leadership Districts (DMLD's) - Weekday Sample

County	Mode Leadership Density																	No MLD Defined	Total: All MLD's						
	1	2	3	11	12	13	14	15	16	21	22	23	24	31	32	33	35								
1 New York	1,166		270					112																	1,548
2 Queens			134	142																					276
3 Bronx			172	99																					271
4 Kings			428	61																					489
5 Richmond							749								64										813
6 Nassau				4	160			24	29	71	37	10	8	24	1	7	9								384
7 Suffolk					7			1	20	54	13		141	50	2	33	111								432
8 Westchester					114			11		76	48				73										322
9 Rockland																250									250
10 Putnam															76						185				261
11 Orange								31			32					58	80	69							270
12 Dutchess											46		18				133	78							275
13 Fairfield									44	33			39	103	11		40								270
14 Bergen					2	9	137		95	12	10	214	23	18	70	34	19								643
15 Passaic								45	72		20		67			10	61								275
16 Hudson		142		188		56		63			27				13										489
17 Essex						232			52	11	30	30	23	11	22		7								418
18 Union					36				76	43			80	18	7										260
19 Morris										3	45	19	28	5	2	41	145								288
20 Somerset									17		31		44			5	169								266
21 Middlesex					8			41		36	9		50	13	152	49	18								376
22 Monmouth								15	5		103	26	43	59	89	43	50								433
23 Ocean																									269
24 Hunterdon																									276
25 Warren																									271
26 Sussex																									277
27 New Haven																									160
28 Mercer																									409
Total: All Counties	1,166	142	1,004	494	327	297	886	343	410	339	451	299	564	450	741	435	961					1,662		10,971	

Table 6
Households in Study Area by County and Density Mode Leadership Districts (DMLD's) - Universe

County	Mode Leadership Density																	No MLD Defined	Total: All MLD's		
	1	2	3	11	12	13	14	15	16	21	22	23	24	31	32	33	35				
1 New York	458,749	-	185,947	-	-	-	-	63,661	-	-	-	-	-	-	-	-	-	-	-	-	708,357
2 Queens	-	-	321,505	396,068	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	717,573
3 Bronx	-	-	266,692	139,882	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	406,574
4 Kings	-	-	717,596	90,954	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	808,550
5 Richmond	-	-	-	-	-	-	-	113,988	-	-	-	-	-	-	-	-	20,167	-	-	-	134,155
6 Nassau	-	-	-	8,615	217,037	-	-	15,122	35,341	86,216	15,032	7,396	12,446	25,823	272	2,299	3,616	-	-	-	435,016
7 Suffolk	-	-	-	-	11,735	-	-	1,068	19,668	60,204	10,439	1,105	141,209	34,120	1,374	34,705	108,695	-	-	-	444,338
8 Westchester	-	-	-	-	123,941	-	-	7,723	-	93,800	22,433	-	-	75,653	-	-	-	-	-	-	323,551
9 Rockland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	84,312	-	4,574	-	-	-	88,886
10 Putnam	-	-	-	-	-	-	-	-	-	-	-	-	-	9,097	-	-	20,595	-	-	-	29,692
11 Orange	-	-	-	-	-	-	-	9,331	-	-	12,768	-	-	-	19,202	16,769	47,077	-	-	-	105,147
12 Dutchess	-	-	-	-	-	-	-	-	-	-	12,415	-	7,545	-	26,695	46,995	-	-	-	-	93,650
13 Fairfield	-	-	-	-	-	-	-	-	53,274	42,703	-	-	50,772	84,574	5,524	-	73,679	-	-	-	310,526
14 Bergen	-	-	-	-	2,938	4,356	24,446	-	96,312	12,424	2,402	84,921	23,716	8,030	30,818	11,392	12,665	-	-	-	314,420
15 Passaic	-	-	-	-	-	-	-	19,190	46,851	-	4,341	-	47,730	-	-	2,582	38,345	-	-	-	159,039
16 Hudson	-	37,697	-	95,264	-	23,493	-	30,203	-	-	12,195	-	-	-	5,273	-	-	-	-	-	204,124
17 Essex	-	-	-	-	10,968	133,488	-	-	40,181	9,800	7,967	13,751	23,186	6,544	10,156	-	7,977	-	-	-	264,017
18 Union	-	-	-	-	27,635	-	-	-	46,605	28,432	-	-	62,446	11,378	2,378	-	-	-	-	-	178,874
19 Morris	-	-	-	-	-	-	-	-	514	3,338	13,061	5,293	15,659	3,851	1,338	10,344	107,013	-	-	-	160,411
20 Somerset	-	-	-	-	-	-	-	-	8,300	-	5,140	-	13,210	-	-	787	72,448	-	-	-	99,885
21 Middlesex	-	-	-	-	6,034	-	-	28,107	-	38,328	3,068	-	74,403	8,036	59,929	14,653	16,825	-	-	-	249,383
22 Monmouth	-	-	-	-	-	-	-	10,085	4,079	319	38,120	14,033	30,539	34,784	40,925	13,636	25,890	-	-	-	212,410
23 Ocean	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	187,902	187,902
24 Hunterdon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42,292	42,292
25 Warren	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36,338	36,338
26 Sussex	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48,786	48,786
27 New Haven	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	309,659	309,659
28 Mercer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	108,783	108,783
Total: All Counties	458,749	37,697	1,491,740	730,981	400,909	161,337	138,434	184,490	351,125	377,564	157,980	126,697	502,861	321,892	281,868	133,862	588,594	733,760	-	-	7,180,538

Table 7
Weighting Factor Adjusting for Probability of Selection by County and Density Mode Leadership Districts (DMLD's)

County		Mode Leadership Density																	No MLD Defined
		1	2	3	11	12	13	14	15	16	21	22	23	24	31	32	33	35	
1	New York	0.601	-	1.052	-	-	-	-	0.868	-	-	-	-	-	-	-	-	-	-
2	Queens	-	-	3.666	4.262	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Bronx	-	-	2.369	2.159	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Kings	-	-	2.562	2.278	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	Richmond	-	-	-	-	-	-	0.233	-	-	-	-	-	-	-	0.481	-	-	-
6	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	-
7	Suffolk	-	-	-	-	2.566	-	-	1.632	1.503	1.703	1.227	-	1.530	1.654	1.202	1.607	1.496	-
8	Westchester	-	-	-	-	1.661	-	-	1.073	-	1.886	0.714	-	-	1.583	-	-	-	-
9	Rockland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.515	-	-	-
10	Putnam	-	-	-	-	-	-	-	-	-	-	-	-	-	0.183	-	-	-	0.170
11	Orange	-	-	-	-	-	-	-	0.460	-	-	0.610	-	-	-	0.506	0.320	1.042	-
12	Dutchess	-	-	-	-	-	-	-	-	-	0.412	-	0.640	-	-	0.307	0.921	-	-
13	Fairfield	-	-	-	-	-	-	-	-	1.850	1.977	-	-	1.989	1.255	0.767	-	2.814	-
14	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	-
15	Passaic	-	-	-	-	-	-	-	0.652	0.994	-	0.332	-	1.088	-	-	0.394	0.960	-
16	Hudson	-	0.406	-	0.774	-	0.641	-	0.732	-	-	0.690	-	-	-	0.620	-	-	-
17	Essex	-	-	-	-	-	0.879	-	-	1.181	1.361	0.406	0.700	1.540	0.909	0.705	-	1.741	-
18	Union	-	-	-	-	1.173	-	-	-	0.937	1.010	-	-	1.193	0.966	0.519	-	-	-
19	Morris	-	-	-	-	-	-	-	-	-	1.700	0.443	0.426	0.854	1.177	1.022	0.385	1.128	-
20	Somerset	-	-	-	-	-	-	-	-	0.746	-	0.253	-	0.459	-	-	0.240	0.655	-
21	Middlesex	-	-	-	-	1.152	-	-	1.047	-	1.627	0.521	-	2.274	0.944	0.602	0.457	1.428	-
22	Monmouth	-	-	-	-	-	-	-	1.027	1.246	-	0.565	0.825	1.085	0.901	0.703	0.485	0.791	-
23	Ocean																		1.067
24	Hunterdon																		0.234
25	Warren																		0.205
26	Sussex																		0.269
27	New Haven																		2.957
28	Mercer																		0.406

Average Expansion Factor 655

Telephone Related Factors: The remaining weighting factors developed for Stage 1 weighting relate to adjustments needed to mitigate probability of selection issues related to telephone ownership, as described below:

- ❑ **Factor 2: Multiple Phone Numbers for One Household.** The probability of selection calculation assumes that each household has one phone line and therefore one chance of selection. However, fourteen percent of the sampled households indicated that they have more than one working phone line that is not dedicated to fax/modem use. Overall, the 10,971 households reported having 12,624 voice lines available, so FACTOR2 was created to compensate for cases in which more than one phone line was available.
- ❑ **Factor 3: Multiple Households Sharing One Phone Number.** In 27 cases, multiple households reported sharing one telephone number. Therefore, the 10,971 phone numbers actually only represented 10,956 households. FACTOR3 was developed to reflect only one household per phone number.
- ❑ **Factor 4: Episodic Telephone Ownership.** As shown in the completed sample, 75 households reported being without a telephone for 2 weeks or longer. These households represent other non-telephone households in the region where ownership is “episodic.” Episodic phone ownership is characterized by phone service being turned on or off over a given period of time, largely due to a lack of financial resources. This is a different type of household from the true non-telephone household, where no telephone service was established. It is also a different type of household than those without phone service for less than 2 weeks, as these represent service interruptions due to telephone company repairs or weather events rather than ability to pay.

To determine the weighting factor required to adjust for episodic telephone ownership, the *RT-HIS* data was 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 are non-telephone households (this includes both episodic and hard core non-telephone ownership).

In reality, only about half of the CPS non-telephone households are episodic. This rate is determined 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 *RT-HIS* data, resulting in FACTOR4.

- ❑ **Factor 5: Normalization of Weights.** If the final 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 weighted by a FACTOR5.

Once each case received a value for each of the five factors, the final weight was calculated through the multiplication of the factors. The final weight was applied in the analysis of the data through the standard weighting conventions of the statistical analysis software package used.

3.7.2 Stage 2 Weighting - Calculation of Weights

Non-response bias in a data set occurs when certain individuals selected in a sample do not participate in the survey. The concern is that “non-respondents will differ from respondents with regard to the survey variables, in which case the survey estimates based on the respondents alone will produce biased estimates of the overall population parameters.”¹ The purpose of this section is to examine the extent to which non-response bias exists in the *RT-HIS* sample, thereby creating the Stage 2 weights.

Four characteristics of the sample were investigated for possible non-response bias as indicated by a possible lower representation in the 1997/98 *RT-HIS* sample than in the earlier 1990 Census, the only comprehensive and valid source of data for comparison:

- ❑ Household Income
- ❑ Household Size
- ❑ Number of Vehicles Owned
- ❑ Age (of Persons)

Each of these are particularly important traveler characteristics for travel demand models, as well as known to be vulnerable to non-response bias in complex and burdensome travel surveys like the *RT-HIS* diary format.

To ascertain the extent to which non-response bias is an issue with this data set, the household demographic characteristics for the 10,971 weekday households were compared to population parameters using 1990 Census Public Use Micro Sample (PUMS) data for the 28-counties that comprised the study area. Two complex, three-dimensional tables were created using: the household size, household vehicle, and household income variables, one using the *RT-HIS* data and the other PUMS data.

For the *RT-HIS* sample households reporting income (75.6%), the factors were calculated in Stage 2 using the ratio of the joint-distribution of household size and income, PUMS to *RT-HIS*, controlling by county groupings:

¹ Kalton, Graham. Introduction to Survey Sampling. (Sage Publications: Beverly Hills, CA, 1987) p. 63.

- ❑ New York City
- ❑ Long Island (Nassau and Suffolk)
- ❑ Mid-Hudson counties of New York
- ❑ Connecticut counties (Fairfield, New Haven)
- ❑ Northern New Jersey Counties (NJTPA), and
- ❑ Mercer County

The regional distributions and average ratios for household income and size are shown in **Table 8**. Current Population Survey (CPS) estimates of family income group for HUD districts in the *RT-HIS* metropolitan region were used to adjust the 1990 PUMS income data to represent 1997 levels.

For the *RT-HIS* households not reporting income, the variable for number of vehicles owned, considered a reasonable surrogate for income, was used to match the distribution of the this subset of the *RT-HIS* households with that of the total PUMS, again by the county-grouping listed above. The regional distributions and average ratios for household income and size are shown in **Table 9**.

Distributions of the three key demographic variables used in the Stage 2 process are shown in **Table 10** through **Table 12**. Also, a comparison of the age of respondents in the *RT-HIS* with those in the 1990 Census is shown in **Table 13**. These tables contain the *RT-HIS* data distributions for the:

- ❑ un-weighted sample of 10,971 households;
- ❑ the sample data after application of the Stage 1 weighting only; and
- ❑ after Final weighting with both Stage 1 and Stage 2 applied.

These tables show the difference between the Census (or PUMS) and the un-weighted *RT-HIS* distributions, and the degree to which the two successive stages of weighting produced a congruence with the Census distribution as a means of improving on the overall representativeness of the *RT-HIS* data.

**Table 8 Stage 2 Weighting: Joint Distribution of Household Income by Household Size
Total Region - PUMS, RT-HIS, and Average Ratio**

Part 1: Income by Household Size		Total: Region		
		PUMS % of Total	RT-HIS % of Total	Ratio
1 Below \$25K	1 1 Person HH	12.50	10.82	1.15
	2 2 Person	5.90	5.19	1.14
	3 3 Person	2.59	2.50	1.04
	4 4 +Person	3.41	3.67	0.93
	Total	24.41	22.19	1.10
2 \$25 - 49K	1 1 Person HH	7.76	10.85	0.72
	2 2 Person	8.22	9.52	0.86
	3 3 Person	4.11	5.15	0.80
	4 4 +Person	5.70	6.03	0.95
	Total	25.79	31.56	0.82
3 \$50 - 74K	1 1 Person HH	3.28	5.42	0.61
	2 2 Person	6.50	7.14	0.91
	3 3 Person	4.21	3.76	1.12
	4 4 +Person	6.57	6.20	1.06
	Total	20.57	22.51	0.91
4 \$75 - 99K	1 1 Person HH	1.12	1.49	0.76
	2 2 Person	3.95	4.19	0.94
	3 3 Person	2.92	2.22	1.31
	4 4 +Person	4.71	3.76	1.25
	Total	12.70	11.66	1.09
5 \$100 +	1 1 Person HH	1.02	1.21	0.84
	2 2 Person	4.82	4.83	1.00
	3 3 Person	3.64	2.29	1.59
	4 4 +Person	7.06	3.74	1.89
	Total	16.54	12.09	1.37
Total: All Households Reporting Income	1 1 Person HH	25.68	29.80	0.86
	2 2 Person	29.39	30.87	0.95
	3 3 Person	17.46	15.92	1.10
	4 4 +Person	27.46	23.41	1.17
	Total	100.00	100.00	1.00

**Table 9 Stage 2 Weighting: Joint Distribution of Number of Vehicles by Household Size
Total Region - PUMS, RT-HIS, and Average Ratio**

Part 2: Vehicles by Household Size		Total: Region		
		PUMS % of Total	RT-HIS % of Total	Ratio
No vehicles	1 person	13.06	13.61	0.96
	2 person	6.62	6.63	1.00
	3 person	3.38	2.29	1.47
	4+ persons	4.83	2.78	1.74
	Total	27.88	25.31	1.10
1 vehicle	1 person	11.37	13.84	0.82
	2 person	10.37	9.99	1.04
	3 person	4.46	4.17	1.07
	4+ persons	5.80	3.59	1.61
	Total	32.01	31.60	1.01
2 vehicles	1 person	1.05	2.68	0.39
	2 person	10.77	14.20	0.76
	3 person	6.05	5.59	1.08
	4+ persons	9.77	7.56	1.29
	Total	27.64	30.03	0.92
3 or more vehicles	1 person	0.20	0.74	0.27
	2 person	1.64	3.72	0.44
	3 person	3.57	3.98	0.90
	4+ persons	7.06	4.62	1.53
	Total	12.47	13.07	0.95
Total: All Households Not Reporting Income	1 person	25.68	30.87	0.83
	2 person	29.39	34.54	0.85
	3 person	17.46	16.03	1.09
	4+ persons	27.46	18.55	1.48
	Total	100.00	100.00	1.00

Table 10 RT-HIS Sample Households - Stage 1 and Final Weighting: by Household Size - Compared with 1990 Census Data and PUMS Data

Household Size	RT-HIS Households: Unweighted	RT-HIS Households: Stage 1 Weighting	1990 Census	Stage 1 minus Census	1990 PUMS	RT-HIS Households: with Stage 2 Weighting	Final minus PUMS
1 person	28.7%	30.1%	26.0%	4.1%	26.1%	25.8%	0.3%
2 persons	32.9%	31.7%	28.9%	2.8%	29.2%	29.4%	-0.2%
3 persons	15.8%	16.0%	17.3%	-1.3%	17.4%	17.4%	0.0%
4+ persons	22.6%	22.3%	27.7%	-5.4%	27.3%	27.4%	-0.1%
Total	100.0%	100.0%	100.0%		100.0%	100.0%	

Table 11 RT-HIS Sample Households - Stage 1 and Final Weighting: by Household Income - Compared with 1990 Census Data and PUMS Data

Household Income	RT-HIS Households: Unweighted	RT-HIS Households: Stage 1 Weighting	1990 Census	Stage 1 minus Census	1990 PUMS	1990 PUMS: Adj to 1997 Incomes	RT-HIS Households: with Stage 2 Weighting	Final minus PUMS (w/ '97 Adj)
Less than \$10k	4.6%	6.5%	13.6%	-7.1%	12.6%	9.2%	7.0%	-2.2%
\$10k but less than \$15k	4.7%	5.7%	6.2%	-0.5%	6.3%	5.4%	6.2%	0.8%
\$15k but less than \$25k	8.3%	10.0%	12.8%	-2.8%	13.5%	9.9%	11.3%	1.4%
\$25k but less than \$35k	11.0%	12.5%	13.0%	-0.5%	13.2%	10.6%	10.3%	-0.3%
\$35k but less than \$50k	18.2%	19.0%	17.0%	2.0%	17.2%	15.2%	15.6%	0.4%
\$50k but less than \$75k	24.9%	22.5%	19.1%	3.4%	19.0%	20.6%	20.5%	0.0%
\$75k but less than \$100k	13.8%	11.7%	8.9%	2.8%	9.0%	12.7%	12.7%	0.0%
\$100k but less than \$150k	6.4%	5.3%	5.9%	-0.6%	3.9%	6.9%	7.5%	0.7%
\$150k or more	8.0%	6.7%	3.5%	3.2%	5.3%	9.7%	9.0%	-0.7%
Total	100.0%	100.0%	100.0%		100.0%	100.0%	100.0%	

Table 12 RT-HIS Sample Households - Stage 1 and Final Weighting: by Number of Vehicles - Compared with 1990 Census Data and PUMS Data

Household Vehicles	RT-HIS Households: Unweighted	RT-HIS Households: Stage 1 Weighting	1990 Census	Stage 1 minus Census	1990 PUMS	RT-HIS Households: with Stage 2 Weighting	Final minus PUMS (w/o Adj)
no vehicles	19.5%	23.7%	32.8%	-9.1%	28.5%	23.5%	-5.0%
1 vehicle	30.4%	32.8%	35.9%	-3.1%	31.9%	31.3%	-0.6%
2 vehicles	34.1%	30.7%	17.7%	13.0%	27.3%	31.1%	3.8%
3+ vehicles	16.0%	12.8%	13.6%	-0.8%	12.3%	14.1%	1.8%
Total	100.0%	100.0%	100.0%		100.0%	100.0%	

Table 13 RT-HIS Sample Households - Stage 1 and Final Weighting: by Age of Persons Compared with 1990 Census Data and PUMS Data

Age Range	RT-HIS: Stage 1 Weighting			1990 Census (a)			RT-HIS: Final Weighting	
	Persons: Un-Weights	% of Total: Un-Weighted	% of Total: Stage 1 Weighting	Count	% of Total	RT-HIS Stage 1 minus Census	% of Total: Final Weighting	RT-HIS Final minus Census
> 5 yrs.	1,633	6.4%	6.8%	1,361,087	6.9%	-0.07%	7.2%	0.32%
5-9 yrs,	1,817	7.1%	7.4%	1,241,825	6.3%	1.06%	7.9%	1.62%
10-14 yrs.	1,629	6.3%	6.8%	1,221,701	6.2%	0.56%	7.4%	1.19%
15-19 yrs.	1,476	5.8%	5.8%	1,291,017	6.5%	-0.65%	6.5%	0.03%
20-24 yrs.	1,177	4.6%	5.1%	1,498,182	7.6%	-2.49%	5.3%	-2.29%
25-29 yrs.	1,732	6.7%	7.0%	1,754,414	8.8%	-1.84%	6.6%	-2.20%
30-34 yrs.	2,159	8.4%	8.5%	1,771,835	8.9%	-0.36%	8.5%	-0.44%
35-39 yrs.	2,398	9.3%	9.3%	1,597,919	8.1%	1.15%	9.1%	1.03%
40-44 yrs.	2,297	9.0%	8.4%	1,471,833	7.4%	1.00%	8.5%	1.10%
45-49 yrs.	1,965	7.7%	7.6%	1,195,824	6.0%	1.57%	7.7%	1.74%
50-54 yrs.	1,840	7.2%	6.4%	990,553	5.0%	1.39%	6.2%	1.19%
55-59 yrs.	1,315	5.1%	4.4%	915,535	4.6%	-0.19%	4.0%	-0.61%
60-64 yrs.	1,131	4.4%	4.5%	922,993	4.7%	-0.17%	4.1%	-0.60%
65-69 yrs.	970	3.8%	3.8%	841,221	4.2%	-0.39%	3.4%	-0.80%
70-74 yrs.	918	3.6%	3.7%	659,899	3.3%	0.36%	3.2%	-0.06%
75 + yrs.	1,203	4.7%	4.6%	1,107,319	5.6%	-1.03%	4.3%	-1.34%
Total Reporting	25,660	100.0%	100.0%	19,843,157	100.0%		100.0%	
Age not reported	990	0.13%						
Total Persons	26,650							

3.7.3 Final RT-HIS Weights and Validation

Two final weights have been developed that are applied to the *RT-HIS* data:

- Final Weight – Normalized (“WHT_F”): the product of the Stage 1 and Stage 2 weights, with a final re-factoring at the county level to achieve an exact match with respect to distribution of households by counties. This weight is normalized to the sample size, so that the average weight is 1.00, and the apparent sample size (“number of cases”) produced in a weighted tabulation (as in SPSS) will approximate the actual sample size (10,971 households).
- Final Weight – Expanded (“EXP_F”): this is simply the product of the normalized final weight and the average expansion factor of 655. This expansion number is consistent with (the reciprocal of) the calculation that the *RT-HIS* weekday sample is a 0.154 percent sample of the 7,180,538 households estimated for the 28 county metropolitan area. When the expansion weight is applied in tabulations of the *RT-HIS* data, the percentage distribution of the results will be identical to those when the normalized weight is used. With the expanded final weight, however, absolute numeric estimates of the total population of households, person, and measures of travel by the residences of the study area are produced. Given the relatively small percentage sample of the region’s population represented by the *RT-HIS* sample, caution in the use of these absolute or expanded numbers is advised.

The final weights are used in analysis of the *RT-HIS* data by including the specific household weight for each household in the analysis file, and selecting either the WHT_F or the EXP_F as the basis for weighting in the statistical analysis program. The household weight needs to be included and applied in any analysis file used for reporting of *RT-HIS* statistics, including household, person, vehicle and trip files.

As part of the validation of the *RT-HIS* and the weighting procedures applied, the *RT-HIS* data set, expanded with the final weights, was used to estimate the number of persons traveling to and through the Manhattan Central Business District (CBD). These estimates can be compared to the 1996 Hub-Bound Travel Report counts of persons entering the CBD (Manhattan south of 60th Street). The Hub-Bound data provide one of the few possible relatively direct comparisons of *RT-HIS* estimates with observed measures of current travel in the study area. The comparisons are shown in **Table 14** and **Table 15**.

Given the overall small rate of sampling of the *RT-HIS*, as well as the CBD’s relatively small share of total regional travel represented in the data, this is a remarkably close approximation. It should be noted, that the Hub-Bound counts include non-resident travel not represented in the *RT-HIS*, as well as “dead heading” taxi and commercial vehicle movements not represented as well.

Table 14 Comparison of the Expanded RT-HIS Sample-Based Estimate of CBD Travel with the Hub-Bound Counts - 7-10 am Peak Period

Hub-Bound Mode	Destined to CBD: RT-HIS Expanded	Route Through CBD: RT-HIS Expanded	Total Entering CBD: RT-HIS Expanded	All Sectors: Hub- Bound Counts - 1996	Difference	Percent of Hub-Bound
Autos-Taxis-Vans- Trucks	166,872	40,223	207,095	228,385	(21,290)	91%
Rail Rapid Transit	594,209	117,376	711,585	858,130	(146,545)	83%
Buses	79,310	20,283	99,593	121,702	(22,109)	82%
Railroad-Ferry-Tram- Bicycle	150,855	19,331	170,186	195,624	(25,438)	87%
Total Public Transit	824,374	156,990	981,364	1,175,456	(194,092)	83%
Total Persons - All Modes	991,246	197,213	1,188,459	1,403,841	(215,382)	85%

Table 15 Comparison of the Expanded RT-HIS Sample-Based Estimate of CBD Travel with the Hub-Bound Counts - 24 Hour Weekday

Hub-Bound Mode	Destined to CBD: RT-HIS Expanded	Route Through CBD: RT-HIS Expanded	Total Entering CBD: RT-HIS Expanded	All Sectors: Hub- Bound Counts - 1996	Difference	Percent of Hub-Bound
Autos-Taxis-Vans- Trucks	507,595	226,753	734,348	1,147,313	(412,965)	64%
Rail Rapid Transit	1,021,376	391,909	1,413,285	1,790,339	(377,054)	79%
Buses	169,437	100,224	269,661	219,729	49,932	123%
Railroad- Ferry_Tram-Bicycle	272,177	63,229	335,406	298,278	37,128	112%
Total Public Transit	1,462,990	555,362	2,018,352	2,308,346	(289,994)	87%
Total Persons - All Modes	1,970,585	782,115	2,752,700	3,455,659	(702,959)	80%

Section 4.0 - Summary of Survey Results

4.1 Travel Analysis and Reporting: Introduction

The principal results of the *RT-HIS* are reported in this section of the Final Report in a series of tables and graphics developed from tabulations of the weekday survey data. In this main section of the report, basic descriptive tabulations of the results are presented, focused on the following general topics of interest for regional transportation and travel behavior.

- ❑ General Travel and Trip Rates
- ❑ Mode Shares
- ❑ Purpose of Travel
- ❑ Time of Day / Day of Week
- ❑ Household Structure
- ❑ Vehicle Ownership
- ❑ Trip Distance, Times and Speeds
- ❑ Auto Trips: VMT Shares, Vehicle Occupancy
- ❑ Transit: Mode of Access, Distribution Mode
- ❑ Taxi and Shared Ride: Trip Characteristics
- ❑ Walk and other non-Motorized: Trip Characteristics

The *RT-HIS* is a detailed and complex data set containing the reported travel behavior of a sample of households in a very large and diverse metropolitan region. With New York City at its core, encompassed by urban, suburban, and rural areas, there is a wide range of development settings in which travel occurs in the region. Furthermore, the complexity of the transportation system and travel markets in the region also add to the challenge of general reporting of the results of the *RT-HIS*. The topics listed above have been selected for the focus in this general report, examining these dimensions of *weekday travel by residents of the region*.

As noted in Section 2.0, three other reports prepared as part of the *RT-HIS* supplement this report on the findings of the survey, and may be of interest to the reader:

Compendium of Results: A comprehensive set of “banner” or simple frequency tabulations of most of the data items collected in the *RT-HIS* – by households, person, places, and vehicles.

Comparative Analysis: Weekday and Weekend Travel Analysis: A report which describes the *weekend* travel for the small sample of households in New Jersey for whom weekend travel data were collected in the *RT-HIS*, supplemented by the weekend travel data found in the NPTS 1995 “over-sample” for New York counties of the region; the focus being on a comparison of core set of travel measures for both weekend and weekday travel.

Special Topics and Analysis Issues: Identification and discussion of the approach to further travel analysis and research that the *RT-HIS* data can support beyond that which has been conducted and reported on in this general report.

The complexity of the *RT-HIS* data and the region in which it was collected, also require that the survey data in the initial data collection and processing format be transformed into a set of standard measures and categories to:

- ❑ simplify analyses and reporting
- ❑ to fit it to the modeling and planning framework
- ❑ to be able to report findings that are consistent with other sources of travel information in the region
- ❑ to be comparable with similar data collected in other metropolitan areas

For this report, and for other analyses to be done with the *RT-HIS* data, it is necessary to “recode” many data items in a pre-established manner. In the tables that follow in Section 4.0, the data have been categorized along several important dimensions that serve to organize the presentation of the results, to reduce the data to understandable and appropriate grouping. These standard data transformations have been implemented with SPSS syntax macros, which are available for analysis and reporting of the *RT-HIS* beyond that presented in this report (See Section 1.7: Availability of RT-HIS Data Products).

Travel Measures:

- ❑ Units of Travel – Trips
- ❑ Geography
- ❑ Origin-Destination markets
- ❑ Trip Travel Times and Distance
- ❑ Time of Day
- ❑ Activity Type and Travel Purpose
- ❑ Modes of Travel

Trip Maker Characteristics

- ❑ Person profiles
- ❑ Household structure

Units of Travel – Trips: For this report, and consistent with standard transportation planning and modeling practice, travel between the places reported are considered “trips” (sometimes referred to as “linked trips”). A single trip in the reporting of the *RT-HIS* may involve multiple modes of travel (sometimes termed “unlinked trips”) -- for example drive auto to rail station, commuter rail segment, and a subway connection from the commuter rail terminal to destination. Using the *RT-HIS* data it is possible to examine “tours,” defined as the set of trips that are made either from and back to home (“home-based”) or from and back to work (“workplace-based”). This topic is explored in the Special Topics and Analysis Issues reported cited above.

Geography: The 28 counties in the New York-New Jersey-Connecticut metropolitan area have been grouped by different sets of county groups. For example, the most detailed of these breakdowns, separates Manhattan from other New York City boroughs (counties), keeps Long Island separate from the Mid-Hudson counties, east and west of the Hudson River. For the counties that comprise the NJTPA , sub-areas are reported on based on a grouping of counties that is consistent with Trans-Hudson travel analysis done by the Port Authority of NY/NJ, grouping counties by both travel corridor and their general urban, suburban, or rural development type.

County groups (Level 1)

Manhattan	New York county
Other NYC	Kings (Brooklyn), Queens, Bronx, and Richmond (Staten Island)
Long Island	Nassau and Suffolk
Mid-Hudson (NYMTC)	Westchester, Putnam and Rockland
Mid-Hudson (Other)	Orange and Dutchess
Connecticut	Fairfield and New Haven
Bergen-Passaic	Bergen and Passaic
Essex-Hudson-Union	Essex, Hudson and Union
Middlesex-Morris-Somerset	Middlesex, Somerset and Morris
Monmouth-Ocean	Monmouth and Ocean
Hunterdon-Sussex-Warren	Hunterdon, Sussex and Warren
Mercer	Mercer
Out of Metro Area	Location outside the 28 county <i>RT-HIS</i> area

County groups (Level 2)

NYC Total	All five boroughs of New York City
Long Island	Nassau and Suffolk
Mid-Hudson (all)	Westchester, Putnam, Dutchess, Rockland and Orange
Connecticut	Fairfield and New Haven
NJTPA	Bergen, Passaic, Hudson, Essex, Union, Somerset, Morris, Middlesex, Ocean, Monmouth, Warren, Hunterdon, and Sussex
Mercer	Mercer (part of DVRPC)
Out of Metro Area	Location outside the 28 county <i>RT-HIS</i> area

County groups (Level 3)

NYMTC Area	All five boroughs of New York City. Long Island, Mid-Hudson (NYTMC)
Other New York Counties	Orange and Dutchess
Connecticut	Fairfield and New Haven
NJTPA	Bergen, Passaic, Hudson, Essex, Union,
Mercer	Somerset, Morris, Middlesex, Ocean, Monmouth, Warren, Hunterdon, and Sussex
	Mercer (part of DVRPC)
Out of Metro Area	Location outside the 28 county <i>RT-HIS</i> area

It is important to note, that all location data in the *RT-HIS* -- homes, workplaces, and all trip origins and destinations -- are coded to specific locations (Longitude and Latitude points), so that it is possible to group the data according to a specific analysis need. For the Best Practice Model development, these location data have been re-coded to Transportation Analysis Zones (BPM Zones or BPZ's) of which there are some 3,500 in the overall region. Data by zones, in turn can be aggregated by BPM "area type" (based on employment and population density) or some other basis that is useful for a particular investigation of travel patterns in the region.

Origin-Destination Markets: The *RT-HIS* data do not provide a large enough sample to support reliable estimates of origin-to-destination flows on anything but a large geographical basis. Unlike the Journey-to-Work data that is available from the Census (15% long form), accurate estimates of county-to-county flows are not supported by the sample size of the *RT-HIS*. On the other hand, useful classification of the travel reported in the *RT-HIS* by the general origin-destination market type is possible.

For this report, trips have been classified for analysis according to the following general pattern with respect to the origin and destination of the travel

- Within County
- To Adjoining County (not NYC and not in other State)
- To Manhattan
- To Other NYC
- To Other NYMTC counties
- To Other NJTPA counties
- To Other in area
- Out of Metro Area

Trip Travel Times and Distance: Travel time data is derived in the *RT-HIS* by calculating the time in minutes between reported times of departing one place and arriving at the next place on a respondent's itinerary. As a result, trip time estimates, particularly short ones are subject to some error due in part to a tendency of respondents to round off to the nearest 5 or even 15 minutes of clock time.

Trip distances tabulated in this report are based two methods of estimating actual travel distances using the point geo-coding of the origin and destinations contained in the *RT-HIS* data:

- ❑ *For trips under 3 miles:* A straight line distance in miles is calculated based on the actual geo-coded points, with simple Cartesian coordinate arithmetic, and then adjusted (increased by a factor of 42%) to account for the average circuitry in traveling on the roadway or transit network.
- ❑ *For trips 3 miles or longer:* Travel distances have been taken from the origin zone-to-destination zone of travel using the NYMTC Best Practice Model highway network in TransCAD, technically referred to as “skims” along the best (minimum travel time) travel path or route between zones. These network-based distances include the average distance represented in the network for “local” travel to and from zone “centroids.”

Activity Type: Using the check list of activity categories shown below (also see Appendix B: Travel Diary Form), respondents reported one or more of the activities they did at each place traveled to during the survey day:

- ❑ Drop off/Pick up someone
- ❑ Visit Friends/relatives
- ❑ Eat Meals
- ❑ Social/Recreation/Entertainment
- ❑ Shop
- ❑ Doctor/dentist/other professional
- ❑ Other family/personal business
- ❑ Religious or civic
- ❑ 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 in-home activities
- ❑ Other out-of-home (Specify)

Travel Purpose: Using the information about activities reported at each place visited during the travel day, the trips between these places have been classified by several methods of describing “trip purpose,” accounting for the reported activities at the two places representing the origin and the destination of the trip. Where more than one activity was reported, for example “work” and “eat meals” it is necessary to use a hierarchy of activities to establish a predominant trip purpose – for example a “work trip.”

Trip Purpose: By Direction

- Home to Work
- Home to School
- Home to Social Recreational
- Home to Personal Business
- Home to Shop
- Home to Serve Pass
- Home to Other Purpose
- Work to Home
- School to Home
- Social-Recreational to Home
- Personal Business to Home
- Shop to Home
- Serve Pass to Home
- Other Purpose to Home
- At Work-Work Related
- At Work-Other
- Other (non-Home or Work)

Trip Purpose - A Conventional Travel Model Classification

- Home-Based Work
- Home-Based School
- Home-Based Other
- Work-Based
- Non-Home or Work-Based

Trip Rates: The *RT-HIS* data has been used to estimate both person and household trip rates for weekday travel:

- Person Trip Rate (trips per person) - the number of trips made by each person during the weekday travel day
- Household Trip Rate (trips per household) - the number of trips made by all person in a household during the weekday travel day.

RT-HIS trip rates by both trip purpose, and by mode of travel have been developed and are reported in this report, typically summarized by the following key trip rates of most interest:

- Total -all types of travel
- Vehicle - by both auto and public transportation modes
- Auto Drive
- Transit
- Walk
- Work - all modes
- Non-Work - all modes

Time of Day: Travel data collected in the *RT-HIS* is reported by clock time. For some travel data, it is sometimes practical and useful to look at the data by hour of departure. Generally, it is more helpful to analyze time of day aspects of travel in the metropolitan area by the following five time periods:

- AM Peak Period: 6-10 am
- Mid-Day: 10 am – 4 pm
- PM Peak Period: 4-8 pm
- Evening: 8-12 midnight
- “Owl”: 12 midnight to 6 am

Modes of Travel:

The *RT-HIS* diary form and data retrieval interview allowed the respondent to report each specific modes of travel they used, and the sequence in which they used them (if more than one) to complete their trip between places. A list of 26 specific modes of travel were used to code the data.

- Commuter Rail
- Ferry
- PATH
- Express Bus
- Subway (NY)
- LRT (Newark)
- Inter-City
- Airport Service
- Charter Bus
- School Bus
- Local Bus
- Contract Bus
- Shuttle-Commute Van
- Yellow-Medallion Taxi
- For Hire Van-Jitney
- Car Service-Black
- Gypsy Cab
- Group Ride
- Motorcycle-Moped
- Auto Driver
- Auto Passenger
- Bicycle
- Skates
- Wheelchair
- Other
- Walk (only)

For transit trips involving more than one of mode of travel, it is necessary to characterize the trip with respect to its principal mode of travel. The list of modes shown above is ordered according to the hierarchy used to define the “main mode” for each trip in the reporting here. For example, the main mode for the trip described above using both commuter rail and the subway would be classified as a Commuter Rail trip. Similarly, a trip by Express Bus, with a transfer to Subway, would be counted as an Express Bus trip in the tables shown in this report.

Key Personal Characteristics: The actual age of each person in the households was reported. These have been categorized by standard age cohorts, comparable to the Census and other demographic reporting. In addition, to support an understanding of variations in personal travel, the general “life cycle” status (or Person Profile) for each person has been classified by a combination of their occupational status and/or age.

- Full-Time Employed
- Part-Time Employed
- Unemployed
- Homemaker
- Adult Student
- Retired
- School Age (<16) yrs
- Under 5 yrs
- Other

Key Household Characteristics: Households in the *RT-HIS* data can be described along most important dimensions needed for analysis of travel patterns – residential location, building type, household size (number of persons), income, vehicle ownership, ethnicity, years at residence, etc. Of these, household size, income, and vehicle ownership are particularly important for travel demand analysis and typically used as the key “stratification” variables for travel forecast modeling.

Additionally, the presence or absence of children, combined with the number workers in the household provides a strong explanatory factor for household travel, and is used as a segmentation variable in the BPM. A set of general Household Structure variables, combining these characteristics has been established and used in the tabulations of results presented in this report.

Presence of Workers:

- 2+ Full-Time Workers
- 1 Full-Time worker and 1+ Part-Time
- 1 Full-Time Worker
- Retired or Unemployed only

Presence of Children:

- 3+ Children
- Children
- 1 Child
- No Child

4.2 General Description of Weekday Travel and Trip Rates

In this section the general pattern and characteristics of travel in the region as estimated with the *RT-HIS* data are examined.

4.2.1 Weekday Trips - General

The *RT-HIS* weekday sample provides a profile of the estimated 59 million weekday trips made by residents of the Metro Area by where they live. The geographic distribution of these trips are shown in **Figure 3**. **Table 16** displays the distribution of all weekday travel, broken down by:

- ❑ county of residence (where persons in the sample household live);
- ❑ county of origin (where trip began); and,
- ❑ county of destination (where trip ended).

For example, this table shows that Brooklyn residents account for the highest percentage (9.2%) of all trips among counties in the region, while Manhattan is the origin or destination of 1 in 8 trips (12.1%) made by residents of the region.

Figure 3 Distribution of Weekday Trips by County Group (Level 1)

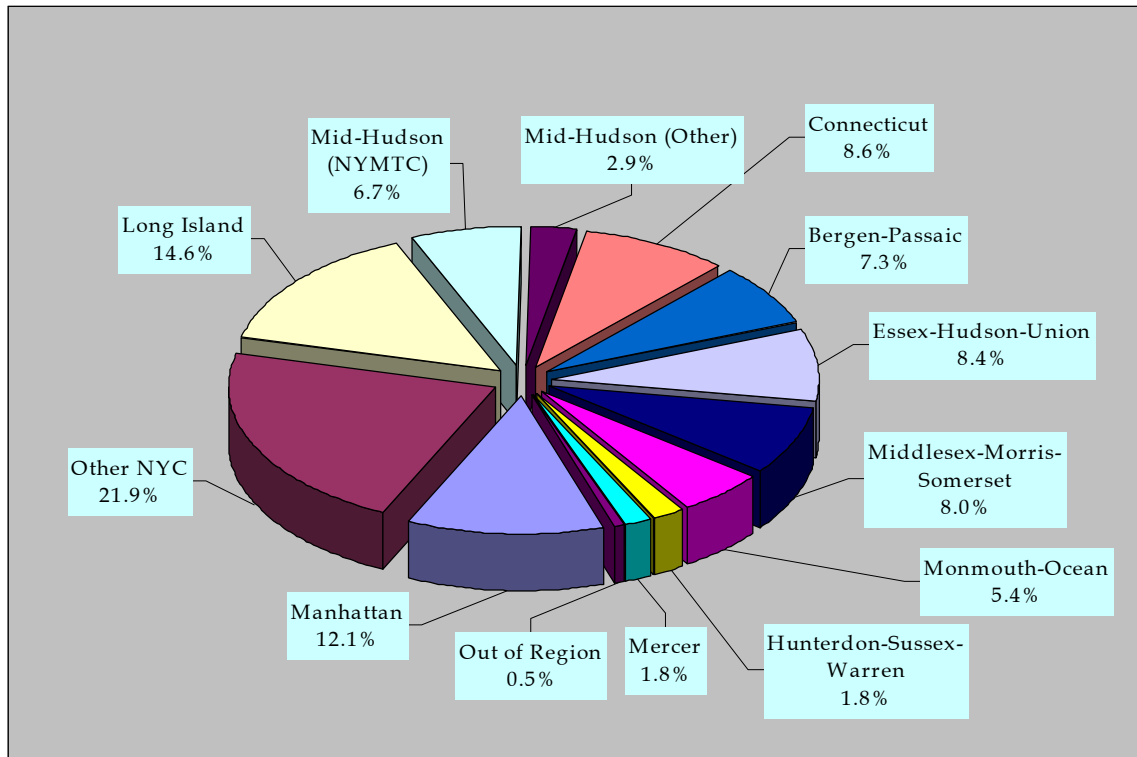


Table 16
Distribution of Weekday Trips by County

County Group	Residents of Area	From Area: (Origin)	To Area: (Destination)
Manhattan	7.8	12.1	12.1
Queens	8.9	7.3	7.3
Bronx	4.6	4.3	4.3
Brooklyn	9.2	8.5	8.4
Staten Island	1.9	1.8	1.8
Nassau	7.2	7.1	7.1
Suffolk	7.8	7.5	7.5
Westchester	5.2	5.0	5.0
Rockland	1.4	1.3	1.3
Putnam	0.5	0.4	0.4
Orange	1.6	1.6	1.6
Dutchess	1.4	1.3	1.3
Fairfield	4.9	4.8	4.8
Bergen	5.2	5.1	5.1
Passaic	2.2	2.1	2.1
Hudson	2.4	2.1	2.1
Essex	3.5	3.6	3.6
Union	2.8	2.7	2.7
Morris	2.8	2.8	2.8
Somerset	1.7	1.7	1.7
Middlesex	3.5	3.5	3.5
Monmouth	3.5	3.3	3.3
Ocean	2.3	2.1	2.1
Hunterdon	0.7	0.6	0.6
Warren	0.5	0.5	0.5
Sussex	0.8	0.7	0.7
New Haven	4.1	3.8	3.8
Mercer	1.7	1.8	1.8
Out of Metro Area		0.5	0.7
Total	100.0	100.0	100.0

Table 17 shows that, when summarized by County groups, over one-third of all travel is to or from New York City (34.0%), with Long Island accounting for almost 1 in 6 trips (14.6%).

Table 17
Distribution of Trips by County Group (Level 1)

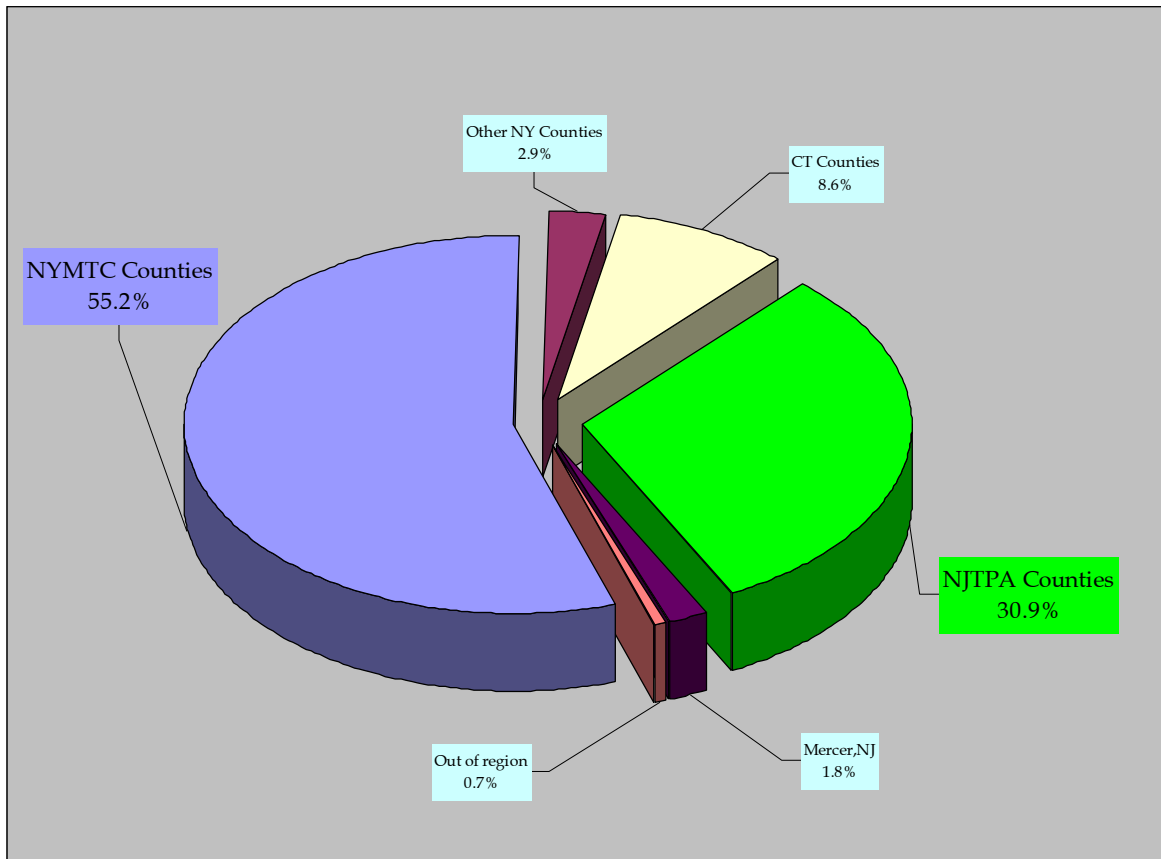
County Group	Residents of Area	From Area: (Origin)	To Area: (Destination)
Manhattan	7.8	12.1	12.1
Other NYC	24.5	21.9	21.8
Long Island	15.0	14.6	14.6
Mid-Hudson (NYMTC)	7.1	6.7	6.7
Mid-Hudson (Other)	3.0	2.9	2.9
Connecticut	9.0	8.6	8.6
Bergen-Passaic	7.4	7.3	7.2
Essex-Hudson-Union	8.7	8.4	8.4
Middlesex-Morris-Somerset	7.9	8.0	8.0
Monmouth-Ocean	5.8	5.4	5.4
Hunterdon-Sussex-Warren	2.0	1.8	1.8
Mercer	1.7	1.8	1.8
Out of Metro Area		0.5	0.7
Total	100.0	100.0	100.0

In **Table 18**, the share of weekday trips by planning jurisdiction is presented. This indicates that the 12 counties that comprise the NYMTC area account for about 55% of weekday travel by residents of the region, and nearly one-third or 31% of it occurs in the NJTPA counties in northern New Jersey.

Table 18
Distribution of Trips by County Group (Level 3)

General Area	Residents of Area	From Area: (Origin)	To Area: (Destination)
NYMTC Counties	54.4	55.3	55.2
Other NY Counties	3.0	2.9	2.9
CT Counties	9.0	8.6	8.6
NJTPA Counties	31.9	30.9	30.9
Mercer	1.7	1.8	1.8
Out of Metro Area	100.0	0.5	0.7
Total	100.0	100.0	100.0

Figure 4
All Weekday Trips: Distribution by Destination - County Group (Level 3)



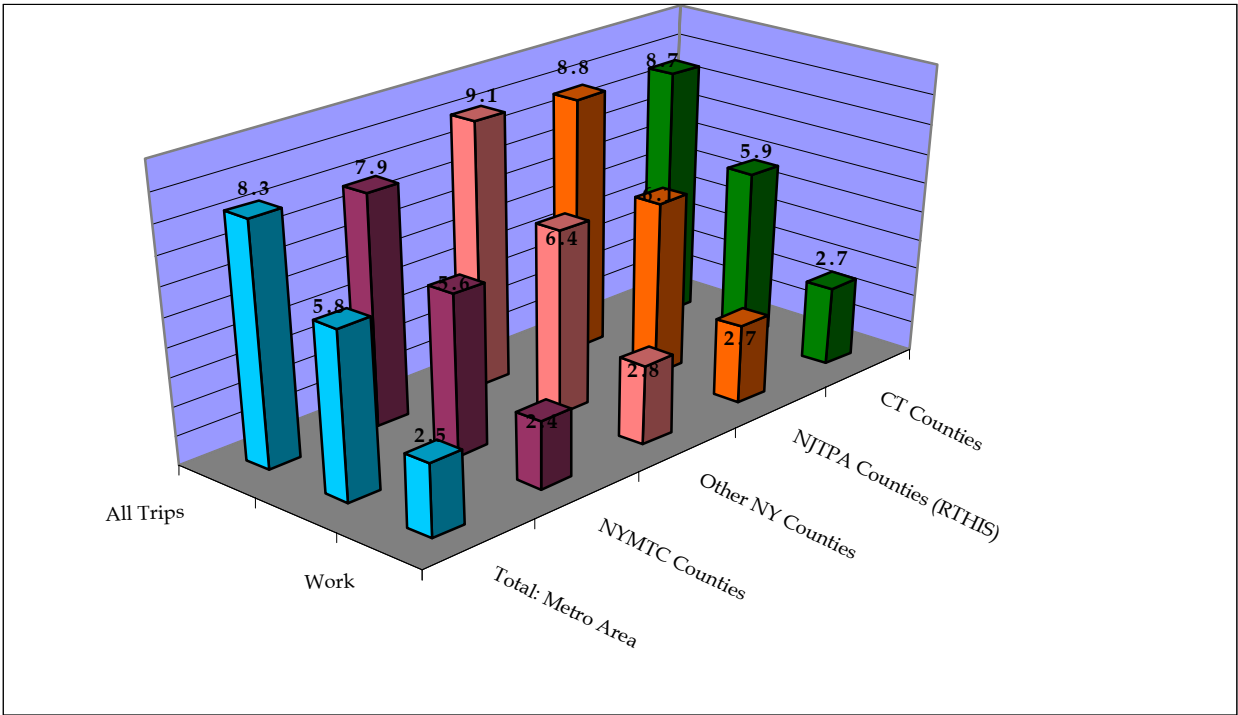
Trip rates are calculated in the *RT-HIS* as the total number of trips made, regardless of length or mode, by all members of a sample household. As shown in **Table 19**, the average number of reported weekday trips per household in the region was 8.3, per person 3.2. Trip rates vary depending on the residence location. Person trip rates are relatively uniform for most places outside the four non-Manhattan boroughs of New York City, and Hudson–Essex–Union in New Jersey, where they are a low of 2.7 and 3.1 respectively. Elsewhere they vary from 3.3 to 3.6.

Household trip rates reflect both person trip rates and household size. Consequently, there is greater variation in household rates among the County groups, with the lowest (6.5) is found in Manhattan (smaller households), and the highest in Long Island (10.2), and Mid-Hudson NYTMC (9.5), and the suburban counties of the NJTPA region (9.3).

Table 19
Households and Person Trip Rates (Mean) by County Group (Level 1)

County Group: Residence	Household Trip Rate	Person Trip Rate
Manhattan	6.5	3.3
Other NYC	7.1	2.7
Long Island	10.2	3.5
Mid-Hudson (NYMTC)	9.5	3.5
Mid-Hudson (Other)	9.1	3.4
Connecticut	8.7	3.4
Bergen-Passaic	9.4	3.5
Essex-Hudson-Union	8.0	3.1
Middlesex-Morris-Somerset	9.3	3.4
Monmouth-Ocean	8.6	3.3
Hunterdon-Sussex-Warren	9.3	3.3
Mercer	9.1	3.6
Total: Metro Area	8.3	3.2

Figure 5
Household Trips Rates - All Trips, Work and Other (non-Work) - Metro Area



4.2.2 General Origin-Destination (O/D) Patterns

The general origin-destination markets of weekday travel in the *RT-HIS* are shown in **Table 20**. Similar to the patterns found in the Census journey-to-work data, the large majority (77.8%) of travel in the region consists of trips made entirely within a single county. This ranges from a low of about 70% of trips in Manhattan to a high of 90% in the two *RT-HIS* counties in Connecticut. The next largest share of weekday travel is to adjoining counties (other than NYC) – ranging from 5.4% (Long Island) to 19.2% (Middlesex-Morris-Somerset); or to other boroughs in New York City, for New York City residents (19.2%).

Overall, 3.7% of all areawide weekday trips are to Manhattan, with Manhattan the destination for 10.5% of trips from other New York City boroughs, and ranging from a low of less than 1% of southern and western NJTPA counties, to about 3.4% for Essex-Hudson and Union county trips.

The *RT-HIS* data also shows that about 0.7% of weekday travel by residents of the metro area is to places outside the metro area.

Table 20
General Origin-Destination (O/D) Patterns by County of Trip Origin - All Weekday Trips - by County Group (Level 1) - Row Percents

County Group of Trip Origin	Within County	To Adjoining County (not NYC)	To Manhattan	To Other NYC	To Other NJTPA County	To Other NYMTC County	To Other in Metro Area	Out of Metro Area
Manhattan	69.5			19.2	5.2	5.2	0.8	0.2
Other NYC	75.7		10.5	6.5	5.0	1.5	0.2	0.6
Long Island	85.2	5.4	2.6	5.5	0.3	0.7	0.2	0.2
Mid-Hudson (NYMTC)	82.1	6.4	3.7	4.2	1.5	1.5	0.4	0.2
Mid-Hudson (Other)	87.7	6.3	1.2	0.5	1.3	1.7	0.2	1.1
Connecticut	90.1	5.7	1.0	0.2	0.3	1.7	0.0	0.9
Bergen-Passaic	76.1	12.1	2.6	1.4	0.5	6.7	0.5	0.1
Essex-Hudson-Union	71.3	18.1	3.4	1.4	1.2	3.8	0.5	0.3
Middlesex-Morris-Somerset	71.7	19.2	1.2	1.1	0.9	4.9	0.7	0.2
Monmouth-Ocean	85.5	7.9	0.8	0.4	0.6	3.4	0.9	0.5
Hunterdon-Sussex-Warren	72.2	16.7	0.6	0.7	0.6	6.5	1.1	1.6
Mercer	80.1	12.7	0.9	0.3	0.2	3.7	0.3	1.8
Out of Metro Area			2.9	8.9	11.1	19.4	15.1	42.7
All Weekday Trips	77.8	6.8	3.7	5.2	2.3	3.0	0.5	0.7

The origin-destination pattern of work travel is graphically contrasted with non-work in **Figure 6** and **Figure 7**.

Figure 6
General Origin-Destination Markets: Metro Area - Weekday Trips - Work

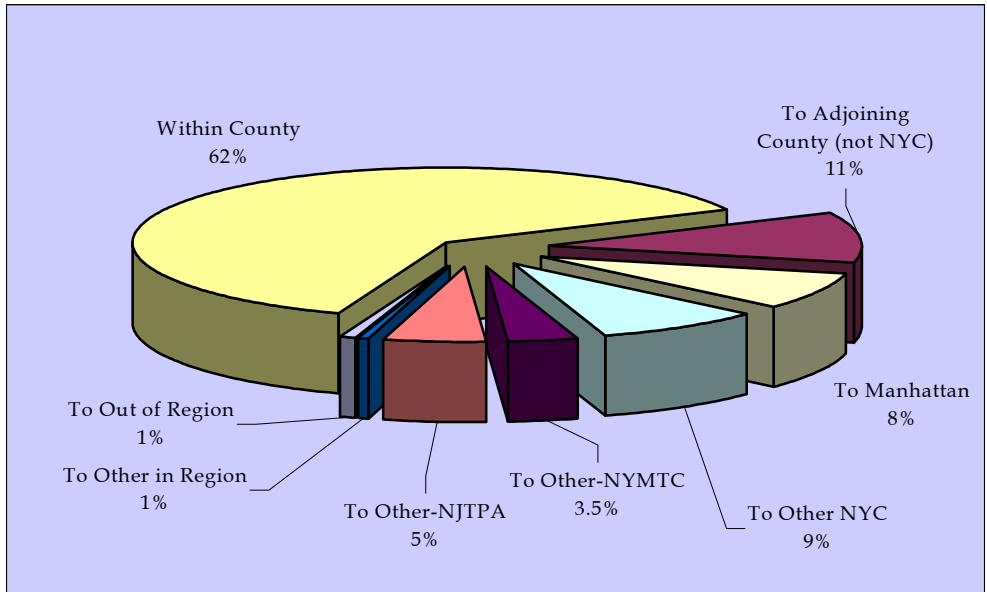
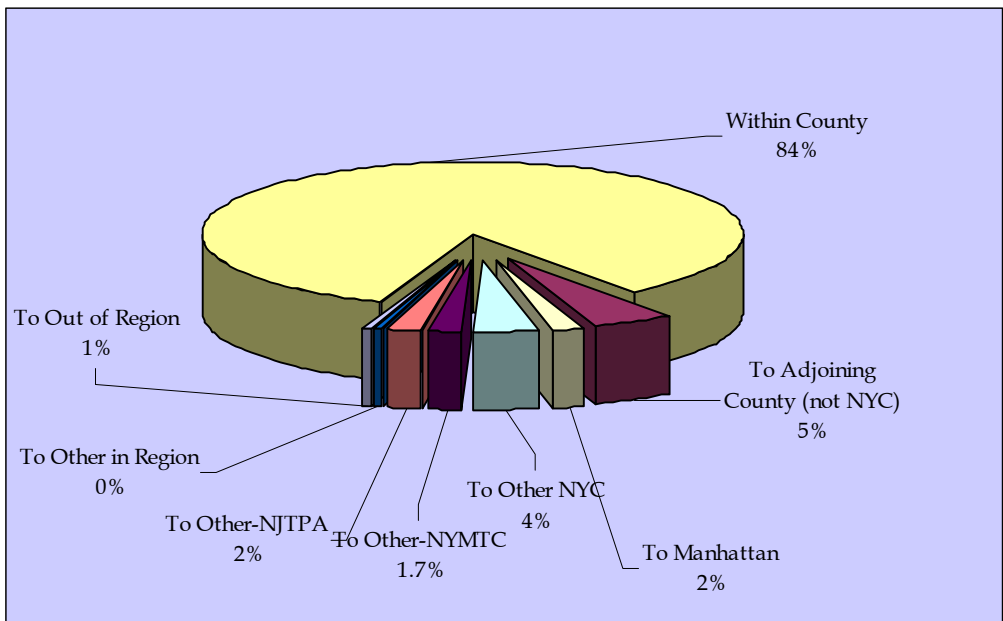


Figure 7
General Origin-Destination Markets: - Metro Area -Weekday Trips - Non-Work



In **Table 21** the general origin-destination distribution of work trips in the *RT-HIS* is arrayed. The share of work trips that are made within-county is consistently lower than those shown above for total (all purposes) travel. Overall, however, not quite two-thirds (62.8%) of all work travel in the region is within the county. The importance of Manhattan as an employment center for the region is revealed with a total share of 8.1% of work travel destinations (exclusive of Manhattan “within county” trips). Other New York City attracts 8.6% of work travel. Work travel to adjoining counties in NJTPA counties is fairly high – ranging from about 19% from Bergen and Passaic, to a 28% from Middlesex, Morris, and Somerset counties.

Table 21
General Origin-Destination (O/D) Patterns by County of Trip Origin - Work Trips

County of Trip Origin	Within County	To Adjoining County (not NYC)	To Manhattan	To Other NYC	To Other NTJPA County	To Other NYMTC County	To Other in Metro Area	Out of Metro Area
Manhattan	59.9			23.8	7.7	7.3	1.2	0.1
Other NYC	50.3		27.1	11.3	7.6	3.0	0.3	0.4
Long Island	74.0	10.0	7.0	7.0	0.4	1.1	0.3	0.2
Mid-Hudson (NYMTC)	67.1	10.0	10.5	7.0	2.2	2.6	0.3	0.3
Mid-Hudson (Other)	80.1	10.5	2.5	0.6	3.0	2.1	0.1	1.0
Connecticut	83.3	10.2	2.3	0.6	0.7	1.5		1.5
Bergen-Passaic	57.9	19.0	6.3	3.4	0.5	11.9	0.8	0.1
Essex-Hudson-Union	52.9	27.9	7.8	2.2	1.9	6.4	0.7	0.2
Middlesex-Morris-Somerset	57.5	28.4	2.7	0.7	1.3	8.9	0.3	0.3
Monmouth-Ocean	70.0	16.3	2.4	0.7	0.5	7.5	1.9	0.7
Hunterdon-Sussex-Warren	51.9	27.0	1.7	2.2	1.2	13.2	1.2	1.7
Mercer	72.1	15.5	2.0	0.2		8.1		2.2
Out of Metro Area			2.3	7.0	7.0	19.4	14.0	50.4
Work Trips - Total	62.4	10.8	8.1	8.6	3.5	5.3	0.7	0.7

The contrasts in the pattern of non-Work travel are shown in **Table 22** . Reflecting shorter trips, about 84% of these trips are within county, and only 2% are to Manhattan.

Table 22
General Origin-Destination (O/D) Patterns by County of Trip Origin - Non-Work Trips

County of Trip Origin	Within County	To Adjoining County (not NYC)	To Manhattan	To Other NYC	To Other NTJPA County	To Other NYMTC County	To Other in Metro Area	Out of Metro Area
Manhattan	77.4			15.3	3.1	3.4	0.5	0.3
Other NYC	83.2		5.5	5.1	4.3	1.1	0.2	0.6
Long Island	89.3	3.8	1.0	4.9	0.3	0.5	0.1	0.2
Mid-Hudson (NYMTC)	87.3	5.2	1.3	3.3	1.3	1.1	0.4	0.2
Mid-Hudson (Other)	90.4	4.8	0.8	0.4	0.8	1.5	0.2	1.2
Connecticut	92.9	3.9	0.4	0.0	0.2	1.9	0.0	0.7
Bergen-Passaic	82.8	9.5	1.2	0.6	0.4	4.8	0.4	0.2
Essex-Hudson-Union	79.3	13.9	1.5	1.1	0.8	2.7	0.4	0.4
Middlesex-Morris-Somerset	78.2	15.0	0.6	1.3	0.7	3.0	0.9	0.2
Monmouth-Ocean	90.2	5.4	0.3	0.4	0.6	2.2	0.6	0.4
Hunterdon-Sussex-Warren	79.2	13.2	0.3	0.2	0.4	4.1	1.0	1.7
Mercer	83.4	11.5	0.3	0.3	0.3	2.0	0.4	1.7
Out of Metro Area			2.8	9.6	12.7	19.5	15.5	39.8
Other: Non-Work Total	84.1	5.2	1.9	3.9	1.7	2.1	0.4	0.7

An aggregated origin-destination matrix of the distribution *RT-HIS* trips is found in **Table 23**, showing the percentages of all weekday trips that are represented by the estimated travel flows between the major county groups. For example, the data show that almost one-third (31.0%) of the estimated 59 million resident-based weekday trips in the region are trips within New York City, and about 29% within NJTPA; 13% on Long Island.

Table 23
Origin-Destination (O/D) Flow Between County groups (Level 2) - All Weekday Trips

Origin County Group		Destination County Group							
	% of Row % of Column % of Total	NYC Total	Long Island	Mid-Hudson (all)	Connecticut	NJTPA	Mercer	Out of Metro Area	Total County Group
NYC Total		91.2	3.4	1.7	0.4	2.8	0.1	0.4	100.0
		91.4	8.0	6.0	1.5	3.1	1.1	21.4	33.9
		31.0	1.2	0.6	0.1	1.0	0.0	0.1	33.9
Long Island		8.0	90.7	0.3	0.1	0.7	0.0	0.2	100.0
		3.5	90.8	0.4	0.2	0.3	0.2	4.0	14.6
		1.2	13.2	0.0	0.0	0.1	0.0	0.0	14.6
Mid-Hudson		6.0	0.4	88.9	1.2	2.9	0.0	0.5	100.0
		1.7	0.3	88.9	1.4	0.9	0.1	7.0	9.7
		0.6	0.0	8.6	0.1	0.3	0.0	0.0	9.7
Connecticut		1.2	0.2	1.4	94.5	1.7	0.0	0.9	100.0
		0.3	0.1	1.3	94.8	0.5	0.1	12.1	8.6
		0.1	0.0	0.1	8.2	0.2	0.0	0.1	8.6
NJTPA		3.1	0.3	0.9	0.4	93.8	1.0	0.4	100.0
		2.9	0.7	3.0	1.6	93.9	16.7	16.4	30.9
		1.0	0.1	0.3	0.1	29.0	0.3	0.1	30.9
Mercer		1.2	0.1	0.1	0.3	16.4	80.1	1.8	100.0
		0.1	0.0	0.0	0.1	0.9	79.8	4.8	1.8
		0.0	0.0	0.0	0.0	0.3	1.4	0.0	1.8
Out of Metro Area		11.8	2.5	8.1	8.3	19.5	6.8	42.9	100.0
		0.2	0.1	0.4	0.5	0.3	2.0	34.3	0.5
		0.1	0.0	0.0	0.0	0.1	0.0	0.2	0.5
Total Metro Area		33.9	14.6	9.6	8.6	30.9	1.8	0.7	100.0
		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
		33.9	14.6	9.6	8.6	30.9	1.8	0.7	100.0

A similar flow matrix for work travel in the *RT-HIS* is shown in **Table 24**.

Table 24
Origin-Destination (O/D) Flow Between County groups (Level 2) - Work Trips

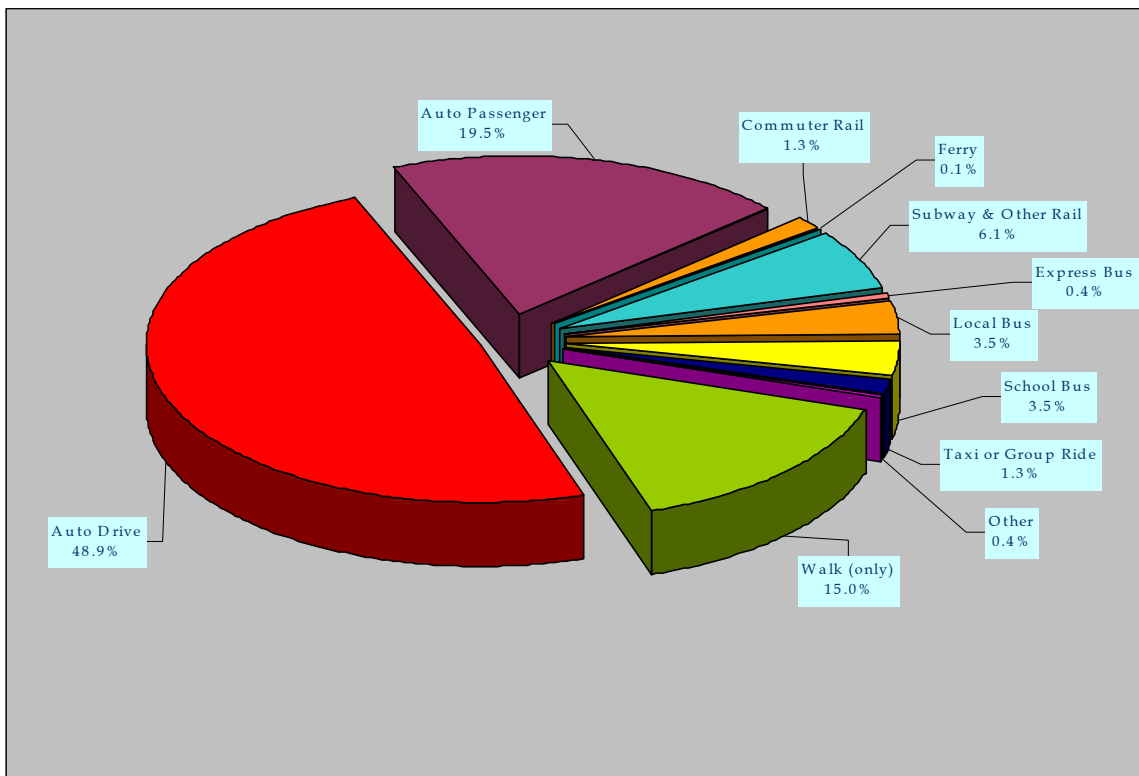
Origin County Group		Destination County Group							
	% of Row % of Column % of Total	NYC Total	Long Island	Mid-Hudson	Connecticut	NJTPA	Mercer	Out of Metro Area	Total County Group
NYC Total		86.1	4.8	2.9	0.7	5.2	0.1	0.2	100.0
		85.4	13.2	12.5	3.0	6.3	2.2	11.6	36.7
		31.6	1.7	1.1	0.3	1.9	0.0	0.1	36.7
Long Island		14.1	84.0	0.4	0.3	1.1		0.2	100.0
		5.1	84.8	0.6	0.4	0.5		3.5	13.4
		1.9	11.2	0.0	0.0	0.2		0.0	13.4
Mid-Hudson		13.1	0.4	79.4	2.4	4.2		0.5	100.0
		3.1	0.3	79.7	2.4	1.2		6.4	8.6
		1.1	0.0	6.8	0.2	0.4		0.0	8.6
Connecticut		3.0	0.5	2.4	91.2	1.5		1.5	100.0
		0.7	0.3	2.5	92.8	0.4		19.2	8.7
		0.3	0.0	0.2	7.9	0.1		0.1	8.7
NJTPA		6.7	0.5	1.3	0.3	89.5	1.4	0.3	100.0
		5.5	1.2	4.5	1.1	89.9	23.5	15.7	30.4
		2.0	0.2	0.4	0.1	27.2	0.4	0.1	30.4
Mercer		2.4				23.5	71.9	2.2	100.0
		0.1				1.4	71.7	5.8	1.8
		0.0				0.4	1.3	0.0	1.8
Out of Metro Area		10.0	2.3	4.6	4.6	19.2	9.2	50.0	100.0
		0.1	0.1	0.3	0.3	0.3	2.6	37.8	0.5
		0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.5
Total Metro Area		37.0	13.2	8.6	8.5	30.2	1.8	0.7	100.0
		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
		37.0	13.2	8.6	8.5	30.2	1.8	0.7	100.0

4.2.3 Modes of Travel

The tables in this section focus on the main mode of travel used to make trips in the *RT-HIS*. As explained in Section 4.1, each trip is necessary to be classified by its principal or “main mode” of travel, when multiple modes have been used.

In **Figure 8**, the overall distribution of weekday travel by residents of the Metro Area is displayed broken down by the principal mode of travel used for trip-making.

Figure 8
Percentage of Travel by General Mode - Metro Area



In **Figure 9** and **Figure 10**, the same mode of travel categories are shown as weekday trips are made in the NYMTC and the NJTPA planning regions respectively.

Figure 9
Percentage Weekday Travel by General Mode - NYMTC Region

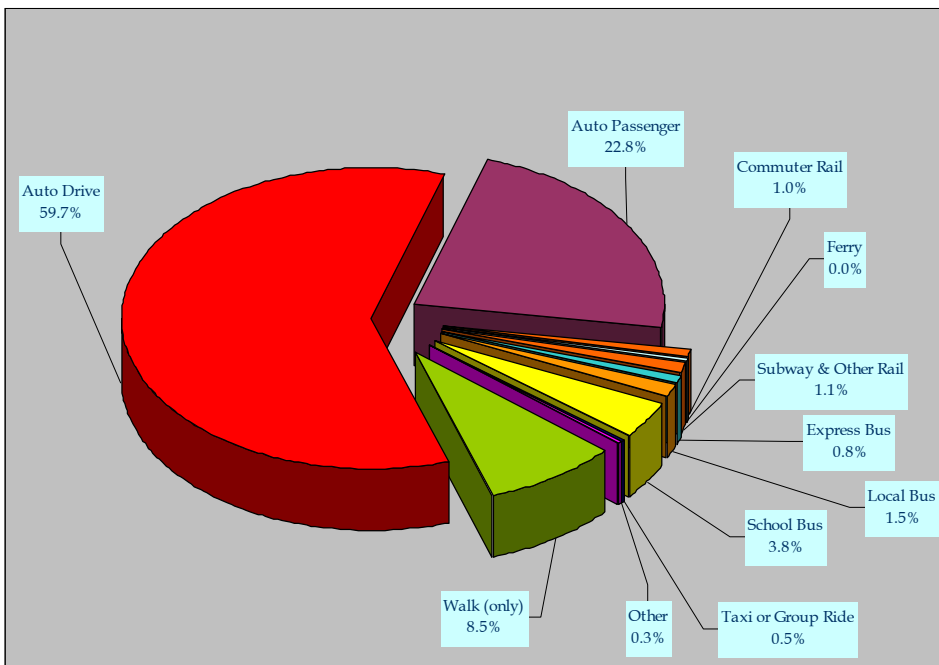
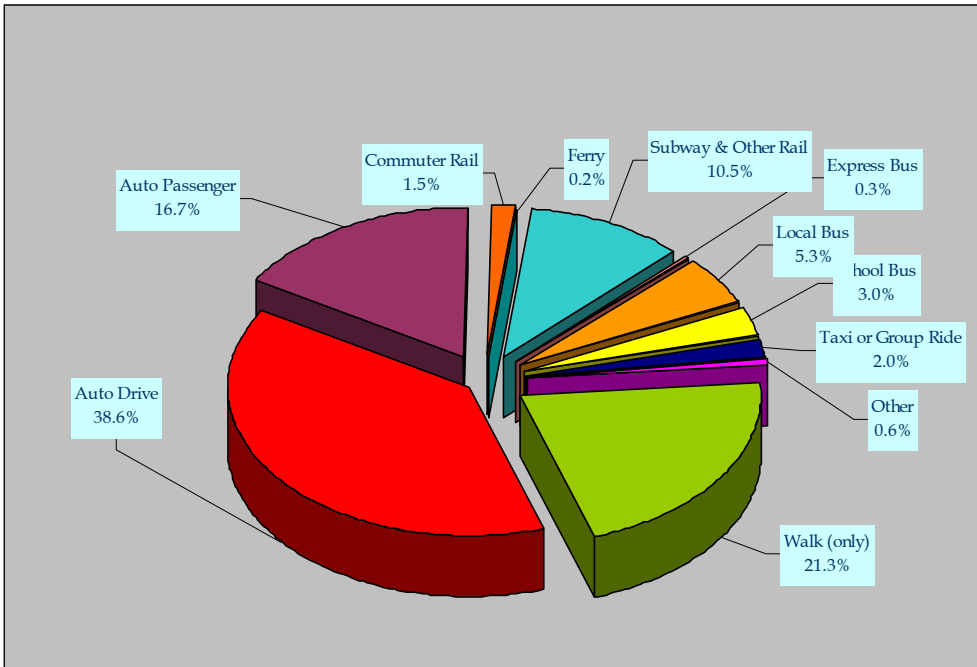


Figure 10
Percentage Weekday Travel by General Mode - NJTPA Region

Table 25 shows the shares of total weekday travel by principal mode of travel. It reveals that while overall auto travel accounts for two-thirds of weekday trips (48.9% auto driver, plus 19.5% auto passenger), walk (15.0%) and transit trips are significant travel modes in the *RT-HIS* metro area. Not surprisingly, there are strong contrasts shown for modal shares across the region as well, particularly New York City compared to other county groups. In the City, the automobile serves only about one-third (36.6%) of weekday trips, while nearly one-third (31.0%) are accommodated by walking, and almost another one-third (29.4%) by public transit or taxi / car service (3.0%).

Outside New York City, it is interesting to note that the school bus accounts for the largest share of weekday trips made by public transportation, ranging from 3.5% to 5.5% of all weekday trips.

As also shown in this table, Commuter Rail travel accounts for about 1% of travel made by NJTPA area, Mercer, and Connecticut residents; 2.5% for Mid-Hudson, and about 3% for Long Island.

Table 25
Percentage Travel Mode by County Group - Residence of Household

Main Mode	County Groups						
	NYC Total	Long Island	Mid-Hudson (all)	Connecticut	NJTPA	Mercer	Total
Auto Drive	23.7	61.7	59.4	65.3	59.7	61.6	48.9
Auto Passenger	12.9	22.4	22.1	22.5	22.8	24.9	19.5
Commuter Rail	0.4	3.0	2.5	1.3	1.0	1.1	1.3
Ferry	0.3	0.1	0.0		0.0		0.1
Subway & Other Rail	17.5	0.3	0.4		1.1	0.1	6.1
Express Bus	0.5		0.2		0.8		0.4
Local Bus	8.4	0.5	1.2	0.9	1.5	1.3	3.5
School Bus	1.7	4.7	5.5	4.6	3.8	4.3	3.5
Taxi or Group Ride	3.0	0.5	0.9	0.3	0.5	0.2	1.3
Other	0.6	0.5	0.4	0.2	0.3	0.1	0.4
Walk (only)	31.0	6.4	7.4	4.9	8.5	6.5	15.0
Total: All Modes	100.0	100.0	100.0	100.0	100.0	100.0	100.0

As shown in **Figure 11**, another way to examine travel patterns by mode of travel is to look at trip rates by method of travel, defined as the number of trips made per household by vehicle (auto and transit), non-vehicle (walk or non-motorized) and by transit only.

Figure 11
Household Trip Rates by Vehicles, Non-Vehicle, and Transit - Metro Area

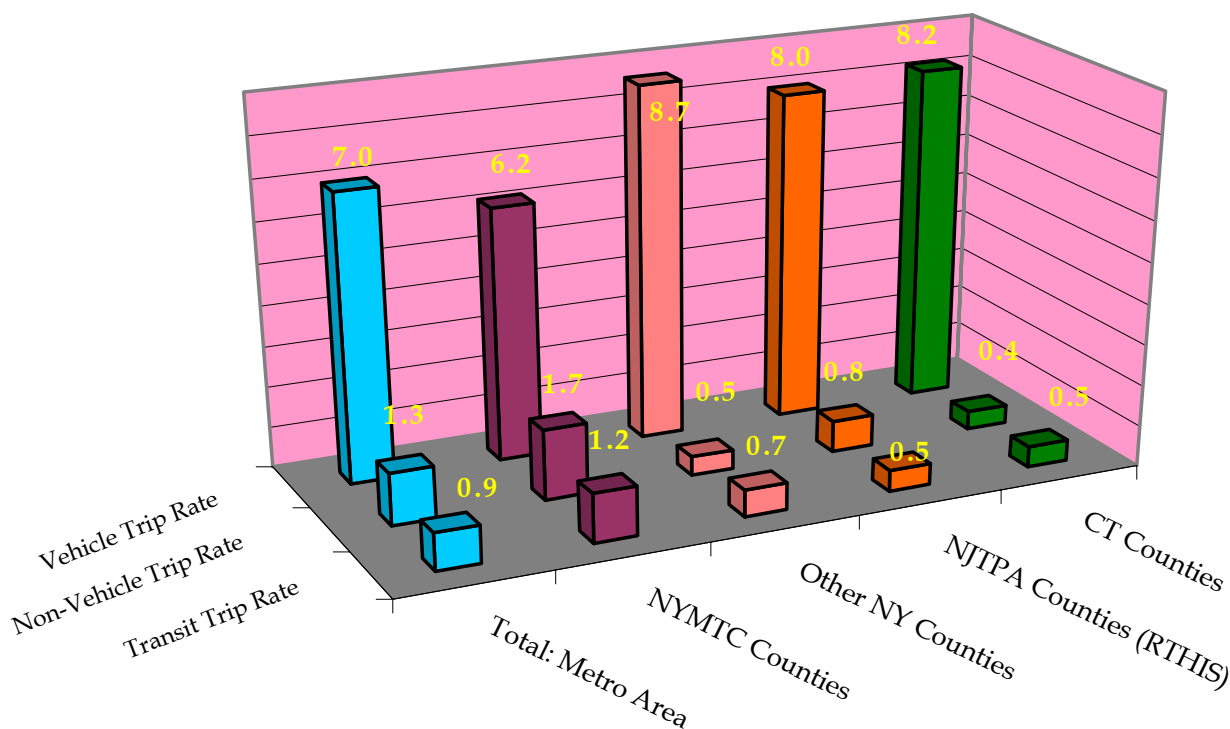


Table 26 shows weekday household trips rates by total (all modes), vehicle, auto driver, transit, and walk only are shown by County groups. Total vehicle trip rates vary from a low of 3.4 per household in Manhattan, and 5.3 for other New York City, to a range of 8.1 to 9.5 for most other parts of the region except for the more urban Essex, Hudson and Union (6.8), where vehicle trip rates are more like those of other New York City. Walk trip rates are the highest in these parts of the region as well - 1.2 in Essex, Hudson and Union, 1.8 in other New York City, and 3.2 for Manhattan residents.

Table 26
Household Trip Rates by Modal Type by County Group (Level 2) - by Residence

County Groups	Total Trip Rate	Vehicle Trip Rate	Auto Driver	Transit Trip Rate	Walk (only)
Manhattan	6.5	3.4	0.4	2.1	3.2
Other NYC	7.1	5.3	2.1	1.8	1.8
Long Island	10.2	9.5	6.3	0.4	0.7
Mid-Hudson (NYMTC)	9.5	8.7	5.5	0.5	0.8
Mid-Hudson (Other)	9.1	8.7	5.8	0.2	0.4
Connecticut	8.7	8.2	5.7	0.2	0.4
Bergen-Passaic	9.4	8.6	5.8	0.3	0.7
Essex-Hudson-Union	8.0	6.8	4.1	0.8	1.2
Middlesex-Morris-Somerset	9.3	8.8	5.9	0.2	0.5
Monmouth-Ocean	8.6	8.1	5.3	0.2	0.5
Hunterdon-Sussex-Warren	9.3	8.9	6.2	0.1	0.4
Mercer	9.1	8.6	5.6	0.2	0.6
Total: Metro Area	8.3	7.1	4.1	1.0	1.2

A similar pattern is shown in **Table 27** for person trip rates by the principal means of travel.

Table 27
Person Trip Rates by Modal Type by County Group of Residence

County Groups	Total Trip Rate -	Vehicle Trip Rate -	Auto Driver	Transit Trip Rate -	Walk (only)
Manhattan	3.3	1.7	0.2	1.1	1.6
Other NYC	2.7	2.0	0.8	0.7	0.7
Long Island	3.5	3.3	2.2	0.1	0.2
Mid-Hudson (NYMTC)	3.5	3.2	2.0	0.2	0.3
Mid-Hudson (Other)	3.4	3.2	2.2	0.1	0.2
Connecticut	3.4	3.2	2.2	0.1	0.2
Bergen-Passaic	3.5	3.3	2.2	0.1	0.3
Essex-Hudson-Union	3.1	2.6	1.6	0.3	0.5
Middlesex-Morris-Somerset	3.4	3.3	2.2	0.1	0.2
Monmouth-Ocean	3.3	3.1	2.0	0.1	0.2
Hunterdon-Sussex-Warren	3.3	3.2	2.2	0.0	0.1
Mercer	3.6	3.4	2.2	0.1	0.2
Total: Metro Area	3.2	2.7	1.6	0.4	0.5

Table 28
Total Trip Rate by County of Work

County of Work	Total Trip Rate - Persons	Vehicle Trip Rate - Persons	Auto Driver	Transit Trip Rate - Persons	Walk (only)
Manhattan	3.6	2.6	0.8	1.4	1.0
Queens	3.3	2.8	2.0	0.6	0.5
Bronx	3.1	2.6	1.8	0.5	0.5
Brooklyn	3.3	2.5	1.4	0.8	0.7
Staten Island	3.6	3.4	2.7	0.3	0.3
Nassau	4.1	3.9	3.4	0.1	0.1
Suffolk	4.0	3.9	3.4	0.1	0.1
Westchester	3.9	3.6	3.1	0.2	0.2
Rockland	4.0	3.7	3.1	0.1	0.3
Putnam	4.4	4.3	3.9	0.0	0.1
Orange	4.0	3.8	3.5	0.0	0.2
Dutchess	4.1	3.9	3.6	0.1	0.2
Fairfield	3.9	3.8	3.4	0.1	0.1
Bergen	4.1	4.0	3.6	0.1	0.1
Passaic	3.6	3.5	3.0	0.1	0.1
Hudson	3.6	3.0	2.2	0.5	0.6
Essex	3.9	3.6	3.1	0.2	0.3
Union	3.6	3.5	2.9	0.3	0.2
Morris	4.0	3.9	3.6	0.0	0.1
Somerset	3.9	3.9	3.6	0.0	0.1
Middlesex	3.8	3.6	3.2	0.1	0.1
Monmouth	3.9	3.8	3.3	0.1	0.2
Ocean	3.8	3.6	3.1	0.0	0.2
Hunterdon	4.1	3.9	3.5	0.0	0.2
Warren	4.0	3.8	3.2	0.1	0.2
Sussex	3.9	3.9	3.3	0.0	0.1
New Haven	4.1	3.9	3.5	0.0	0.2
Mercer	4.2	3.9	3.5	0.1	0.3
Total: Metro Area	3.7	3.3	2.4	0.5	0.4

In **Table 29**, mode shares of the general origin-destination markets are examined. This shows that about of 30.3% of all weekday trips to Manhattan (from elsewhere) are made by auto, nearly half (42.4%) by subway, almost one in eight (13.6%) by commuter rail, and about 4.8% by Express Bus. Nearly one in five (18.8%) within-county trips is a walk trip. Virtually all, 94.8% of trips made outside the county to the adjoining county are by automobile.

Table 29
Modal Group by Trip Type - Origin-Destination Market / Pattern

Modal Group	Within County	To Adjoining County (not NYC)	To Manhattan	To Other NYC	To Other NJTPA County	To Other NYMTC County	To Other in Metro Area	Out of Metro Area
Auto Drive	47.7	74.2	22.9	39.1	57.3	61.9	55.4	54.6
Auto Passenger	7.0	20.6	7.4	14.2	19.1	17.3	21.2	30.7
Commuter Rail	0.2	1.0	13.6	1.2	15.1	4.3	13.8	0.3
Ferry	0.0	0.0	1.1	0.8		0.3		0.3
Subway & Other Rail	3.3	0.4	42.4	32.7	1.9	5.0	0.9	2.0
Express Bus	0.0	0.0	4.8	1.5	0.4	4.6		
Local Bus	3.9	1.2	2.1	4.8	1.4	1.1		0.2
School Bus	4.0	1.1	1.1	1.7	2.4	2.0	4.9	7.3
Taxi or Group Ride	1.3	0.3	2.3	2.3	0.7	0.9	1.3	2.2
Other	0.5		0.3	0.2		0.2		
Walk (only)	18.8	1.3	2.0	1.5	1.8	2.4	2.5	2.3
Total: All Modes	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 30 displays the mode shares of weekday travel by residences of each county in the region. The most dramatic value in this table indicates that half (49.5%) of weekday trips made by Manhattan residents are walk trips.

Table 30
Share of Total Travel by General Model by County Group of Residence (row %)

County Group	Modal Group					Total
	Auto	Rail or Ferry	Bus	Taxi-Shared Ride	Walk-non Motorized	
Manhattan	10.4	22.6	10.9	6.6	49.5	100.0
Queens	50.9	17.4	8.6	1.0	22.2	100.0
Bronx	38.9	16.6	12.1	4.0	28.5	100.0
Brooklyn	36.5	18.6	11.5	2.0	31.5	100.0
Staten Island	72.7	5.2	10.1	1.0	11.1	100.0
Nassau	81.0	4.9	3.9	0.5	9.7	100.0
Suffolk	87.0	1.8	6.0	0.8	4.4	100.0
Westchester	77.9	4.7	5.8	1.3	10.2	100.0
Rockland	84.0	0.9	9.8	0.4	4.9	100.0
Putnam	85.6	2.8	6.7	0.2	4.8	100.0
Orange	84.6	0.8	8.0	0.8	5.8	100.0
Dutchess	88.1	0.8	6.1	0.5	4.4	100.0
Fairfield	86.8	2.4	6.0	0.4	4.4	100.0
Bergen	86.3	1.1	4.0	0.5	8.2	100.0
Passaic	87.1	0.3	4.2	0.1	8.4	100.0
Hudson	52.6	9.3	9.4	1.4	27.2	100.0
Essex	75.8	4.0	6.2	0.4	13.6	100.0
Union	86.1	3.1	3.3	0.7	6.8	100.0
Morris	88.6	1.2	5.2	0.4	4.6	100.0
Somerset	89.2	0.6	6.0	0.5	3.8	100.0
Middlesex	84.7	2.4	5.8	0.6	6.5	100.0
Monmouth	83.9	1.4	8.0	0.7	6.1	100.0
Ocean	82.9	0.2	10.0	0.5	6.3	100.0
Hunterdon	89.4	0.5	5.8	0.2	4.2	100.0
Warren	87.6	0.4	5.9	0.4	5.7	100.0
Sussex	87.9	0.1	8.0	0.1	3.8	100.0
New Haven	89.1	0.0	4.4	0.6	5.9	100.0
Mercer, NJ	86.5	1.2	5.3	0.4	6.6	100.0
Total: Metro Area	68.4	7.5	7.3	1.4	15.4	100.0

In **Table 31**, the shares of travel by general mode are shown for the distribution of travel by the purpose of the trip, considering both the origin and the destination activity. This table shows that Rail or Ferry serves about one in five work trips in the region (19.8% to work; 19.1% from work), and Bus and Taxi-Shared ride about 8%.

Table 31
Trip Purpose by Modal Group - General *Row Percents*

Trip Purpose	Modal Group					Total
	Auto	Rail or Ferry	Bus	Taxi-Shared Ride	Walk-non Motorized	
Home to Work	67.8	19.8	5.9	1.5	5.1	100.0
Home to School	37.8	7.2	35.1	0.2	19.7	100.0
Home to Social Recreational	70.1	4.5	4.9	1.4	19.1	100.0
Home to Personal Business	72.7	5.8	6.3	2.4	12.8	100.0
Home to Shop	75.5	2.6	2.6	0.6	18.8	100.0
Home to Serve Pass	83.6	0.7	1.2	0.3	14.2	100.0
Home to Other Trip	68.0	7.0	2.0	2.8	20.2	100.0
Work to Home	68.5	19.1	5.8	2.0	4.7	100.0
School to Home	33.7	6.9	37.1	0.3	22.1	100.0
Social Recreational to Home	70.1	4.6	4.4	2.1	18.8	100.0
Personal Business to Home	75.8	5.1	5.7	2.0	11.4	100.0
Shop to Home	76.1	2.3	2.5	0.8	18.3	100.0
Serve Pass to Home	83.4	0.6	1.3	0.9	13.8	100.0
Other Trip to Home	66.8	8.0	3.6	3.2	18.5	100.0
At Work-Work Related	71.1	13.3	2.0	2.5	11.1	100.0
At Work-Other	65.4	8.3	2.8	1.6	21.8	100.0
Other (non-Home or Work)	73.0	3.6	4.4	1.4	17.7	100.0
Total: Metro Area	68.4	7.5	7.3	1.4	15.4	100.0

When examined by the time of travel during the day as in **Table 32**, the variations in mode share patterns are not as stark as might be expected, given the dominance of work travel in the peak periods. Subway and commuter rail shares are at their highest during the peak periods; while walk trips accommodate their highest share during the mid-day period. It is interesting to observe that school bus trips account for 6.6 % of all person trips during the four hour morning peak period.

Table 32
Modal Group by Time Period of Travel

Modal Group	Travel Period					Total
	Owl 12am-6am	AM Peak 6am-10am	Midday 10am- 4pm	PM Peak 4pm-8 pm	Evening 8pm- 12 am	
Auto Drive	59.8	49.4	47.1	49.9	49.0	48.9
Auto Passenger	13.3	15.6	18.6	22.1	27.4	19.5
Commuter Rail	3.8	2.2	0.4	1.8	0.6	1.3
Ferry	0.4	0.2	0.0	0.1	0.0	0.1
Subway & Other Rail	7.5	7.9	4.4	7.1	4.7	6.1
Express Bus	1.3	0.7	0.2	0.6	0.2	0.4
Local Bus	3.1	4.0	4.1	2.7	1.9	3.5
School Bus	0.4	6.6	4.5	0.6	0.2	3.5
Taxi or Group Ride	3.4	1.0	1.2	1.3	2.4	1.3
Other	0.4	0.2	0.5	0.5	0.5	0.4
Walk (only)	6.7	12.3	19.0	13.3	12.9	15.0
Total: All Modes	100.0	100.0	100.0	100.0	100.0	100.0

A more detailed picture of mode use for weekday travel by residents of the various County groups is provided in **Table 33**.

Table 33
County Group of Residence by Modal Group – Row Percents

County Group	Modal Group											Total
	Auto Drive	Auto Passenger	Commuter Rail	Ferry	Subway & Other Rail	Express Bus	Local Bus	School Bus	Taxi or Group Ride	Other	Walk (only)	
Manhattan	6.1	4.2	0.5	0.2	21.9	0.2	9.2	1.6	6.4	1.1	48.3	100.0
Other NYC	29.3	15.7	0.4	0.3	16.0	0.6	8.2	1.7	1.9	0.5	25.5	100.0
Long Island	61.7	22.4	3.0	0.1	0.3		0.5	4.7	0.5	0.5	6.4	100.0
Mid-Hudson (NYMTC)	57.7	21.9	3.3		0.5	0.1	1.5	5.2	1.0	0.3	8.5	100.0
Mid-Hudson (Other)	63.5	22.5	0.7	0.0	0.1	0.3	0.7	6.3	0.5	0.5	4.9	100.0
Connecticut	65.3	22.5	1.3				0.9	4.6	0.3	0.2	4.9	100.0
Bergen-Passaic	61.6	24.9	0.6	0.1	0.2	1.5	0.9	1.6	0.3	0.3	8.0	100.0
Essex-Hudson-Union	51.2	21.5	1.6	0.1	3.5	0.9	3.9	1.5	0.7	0.2	15.0	100.0
Middlesex-Morris-Somerset	63.8	23.2	1.4		0.2	0.4	0.4	4.9	0.4	0.4	4.9	100.0
Monmouth-Ocean	61.8	21.7	0.5	0.0	0.4	0.5	0.9	7.5	0.5	0.4	5.8	100.0
Hunterdon-Sussex-Warren	66.3	22.0	0.2		0.2	0.2	0.1	6.5	0.2	0.2	4.2	100.0
Mercer	61.6	24.9	1.1		0.1		1.3	4.3	0.2	0.1	6.5	100.0
Total: Metro Area	48.9	19.5	1.3	0.1	6.1	0.4	3.5	3.5	1.3	0.4	15.0	100.0

A similar detailed picture of mode use for weekday travel by the County Group of destination for total weekday travel is provided in **Table 34**.

Table 34
County Group of Trip Destination by Modal Group – Row Percents

County Group	Modal Group											Total
	Auto Drive	Auto Passenger	Commuter Rail	Ferry	Subway & Other Rail	Express Bus	Local Bus	School Bus	Taxi or Group Ride	Other	Walk (only)	
Manhattan	10.0	4.6	4.2	0.4	25.9	1.5	6.1	0.9	5.0	0.7	40.5	100.0
Other NYC	31.2	16.2	0.4	0.2	12.3	0.4	9.2	2.0	1.9	0.5	25.7	100.0
Long Island	63.3	23.3	1.7	0.0	0.2		0.5	4.5	0.4	0.5	5.5	100.0
Mid-Hudson (NYMTC)	59.0	23.2	2.0		0.3	0.1	1.4	5.7	0.6	0.3	7.4	100.0
Mid-Hudson (Other)	62.9	23.2	0.4	0.0	0.1	0.2	0.6	6.7	0.5	0.6	4.9	100.0
Connecticut	65.8	22.5	0.9		0.0		0.9	4.7	0.3	0.2	4.7	100.0
Bergen-Passaic	62.9	25.2	0.4	0.0	0.1	1.1	1.0	1.7	0.2	0.3	7.1	100.0
Essex-Hudson-Union	53.1	22.1	1.3	0.1	2.2	0.5	3.8	1.6	0.6	0.2	14.5	100.0
Middlesex-Morris-Somerset	65.4	23.0	0.8		0.1	0.2	0.4	4.9	0.4	0.3	4.4	100.0
Monmouth-Ocean	61.2	22.6	0.3		0.0	0.3	0.9	7.7	0.5	0.4	6.1	100.0
Hunterdon-Sussex-Warren	64.1	23.4	0.1		0.2	0.2	0.2	7.1	0.2	0.2	4.4	100.0
Mercer	60.6	26.5	0.8		0.1		1.2	3.9	0.2	0.1	6.6	100.0
Out of Metro Area	54.9	30.9	0.3	0.3	1.5		0.2	7.4	2.2		2.3	100.0
Total	48.9	19.5	1.3	0.1	6.1	0.4	3.5	3.5	1.3	0.4	15.0	100.0

4.2.4 Why Travel is Made: Trip Purpose

In this section, the weekday travel in the region is analyzed with a focus on the activities served by travel, or in other words, trip purpose.

The distribution of weekday travel as classified with respect to both the activities at their origin and at their destination are shown in **Table 35** (see Section 4.1 for discussion of trip purpose categories). This shows that 9.5% of all weekday trips are from home to work (no stop in between), and 8.6% returning from work to home (again no stop). About 18% of all weekday trips are between places other than home and work. The next most prevalent trip purpose is Social Recreational -- 6.5% from home, 7.6% to home.

Table 35
Percentage Trip Purpose by County Group (One Way Based)

Trip Purpose	County Groups						
	NYC Total	Long Island	Mid-Hudson (all)	Connecticut	NJTPA	Mercer	All County Groups
Home to Work	9.6	9.5	8.6	9.7	9.8	9.3	9.5
Home to School	5.5	4.7	5.1	5.4	5.4	5.5	5.3
Home to Social Recreational	6.8	6.7	6.3	7.2	6.1	5.6	6.5
Home to Personal Business	5.3	4.6	4.7	4.9	4.8	4.9	4.9
Home to Shop	3.8	4.0	4.1	3.1	4.1	3.5	3.9
Home to Serve Pass	3.3	4.7	4.3	5.4	5.2	5.2	4.4
Home to Other Trip	1.3	1.3	0.9		0.8	0.1	0.9
Work to Home	8.4	8.8	8.0	8.2	9.1	8.8	8.6
School to Home	4.8	4.3	4.5	4.9	4.8	4.2	4.7
Social Recreational to Home	8.2	7.2	7.0	8.4	6.9	8.1	7.6
Personal Business to Home	4.6	4.2	4.6	4.1	4.4	4.4	4.4
Shop to Home	5.1	5.3	5.7	5.4	5.4	4.8	5.3
Serve Pass to Home	2.8	4.2	3.4	4.5	4.5	3.9	3.8
Other Trip to Home	1.2	1.2	0.7		0.7	0.2	0.9
At Work-Work Related	1.9	2.3	2.5	1.8	2.0	1.8	2.0
At Work-Other	9.9	9.6	10.7	9.9	8.8	10.8	9.6
Other (non-Home or Work)	17.6	17.4	18.8	17.1	17.1	18.9	17.5
Total: All Trips	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Trip purpose shares by general origin-destination pattern are shown in **Table 36**. Home to work travel dominates travel to Manhattan (46.8%) and is a large share of trips to adjoining counties (16.9 % from home; 15.3% to home).

Table 36
Percentage Trip Purpose by County Group Based on Origin (One Way)

Trip Purpose	Within County	To Adjoining County (not NYC)	To Manhattan	To Other NYC	To Other NJTPA County	To Other NYMTC County	To Other in Metro Area	Out of Metro Area
Home to Work	6.9	16.9	46.8	10.6	8.1	15.8	7.6	8.8
Home to School	6.0	2.2	4.3	2.7	2.0	3.0	1.8	1.0
Home to Social Recreational	6.8	5.1	5.0	4.9	9.6	4.0	3.1	16.3
Home to Personal Business	5.3	4.4	6.0	2.7	2.4	2.1	1.3	2.8
Home to Shop	4.3	3.3	2.2	1.1	2.7	2.0	0.7	1.8
Home to Serve Pass	5.0	3.2	2.2	1.6	1.7	2.9	0.7	1.5
Home to Other Trip	1.0	0.5	1.0	0.6	0.3	0.3		3.8
Work to Home	6.2	15.3	3.2	24.7	25.6	21.9	20.8	0.3
School to Home	5.4	1.8	1.0	3.5	2.4	3.1	2.7	
Social Recreational to Home	7.8	6.4	3.3	9.6	7.0	8.2	11.4	0.2
Personal Business to Home	4.6	4.0	1.1	5.3	4.7	3.0	6.5	
Shop to Home	6.0	4.7	0.4	3.2	1.5	3.4	6.5	0.2
Serve Pass to Home	4.2	3.2	0.4	1.8	2.8	2.4	6.3	0.2
Other Trip to Home	1.0	0.6	0.2	1.3	0.6	0.6		
At Work-Work Related	1.8	3.0	3.1	3.3	1.9	3.1	0.9	2.8
At Work-Other	9.4	10.6	10.7	9.2	10.7	10.9	12.1	14.1
Other (non-Home or Work)	18.4	14.8	9.1	13.7	15.9	13.2	17.7	46.3
Total: All Trips	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Using a conventional “home-based” definition of trip purpose, **Table 37** shows the distribution of trips classified in this manner as commonly used in travel forecasting models and other transportation studies. This indicates that Home-Based Work (HBW) travel is about 18.2% of total weekday travel in the region, and Home-Based Other (HBO) about 42.7%. Home-Based School accounts for 10.2%, while other Work-Based (non-home) represents 11.7%, with Non-Home or Non-Work-Based the remaining 17.5%. These shares are fairly constant across the County groups.

Table 37
Percentage Trip Purpose for a County Group (Two-Way based)

Trip Purpose	County Groups						
	NYC Total	Long Island	Mid-Hudson (all)	Connecticut	NJTPA	Mercer	Total
Home-Based Work	18.0	18.3	16.6	18.0	18.9	18.1	18.2
Home-Based School	10.2	9.0	9.6	10.3	10.2	9.7	10.0
Home-Based Other	42.5	43.3	41.7	42.9	42.9	40.6	42.7
Work-Based	11.7	11.9	13.3	11.7	10.9	12.6	11.7
Non-Home or Work-Based	17.6	17.4	18.8	17.1	17.1	18.9	17.5
Total: All Purposes	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 38 displays the share of travel by this “two-way” trip purpose definition by general origin-destination markets.

Table 38
Percentage Trip Purpose by County Group based on Origin (Two Way)

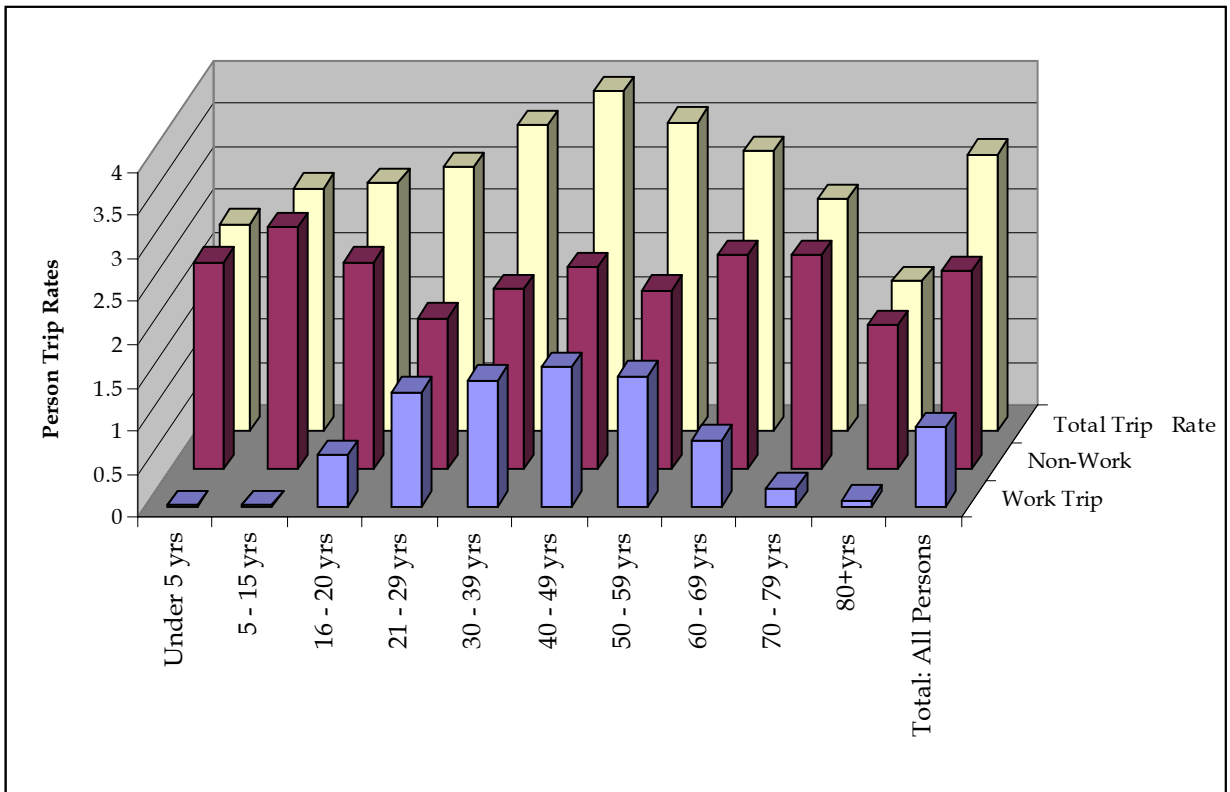
Trip Purpose	Within County	To Adjoining County (not NYC)	To Manhattan	To Other NYC	To Other NJTPA County	To Other NYMTC County	To Other in Metro Area	Out of Metro Area
Home-Based Work	13.1	32.3	50.0	35.3	35.4	9.1	18.2	9.1
Home-Based School	11.4	4.0	5.3	6.2	5.2	1.2	10.0	1.2
Home-Based Other	46.0	35.4	21.9	32.2	31.4	26.9	42.7	26.8
Work-Based	11.1	13.6	13.8	12.6	13.4	16.9	11.6	16.9
Non-Home or Work-Based	18.4	14.8	9.1	13.7	14.6	45.9	17.5	46.1
Total: All Purposes	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

The rate of making work trips and other weekday trips varies substantially by the age of the trip-maker as shown in Table 39 and in Figure 12. While the regional (all person) average work trips per person is .92, work trip rates are the highest in the 40-49 year old cohort (1.61 per weekday). Non-Work person trip rates are much more uniform across age groups, with lower than average (2.29) rates indicated for 20 - 39 year olds, and for the 80 years and older group.

Table 39
Person Trip Rates by Age Group

Age Group	Work Trip	Non-Work	Total Trip Rate
Under 5 yrs	0.01	2.39	2.40
5 - 15 yrs	0.02	2.80	2.82
16 - 20 yrs	0.59	2.39	2.88
21 - 29 yrs	1.32	1.74	3.06
30 - 39 yrs	1.46	2.08	3.54
40 - 49 yrs	1.61	2.33	3.94
50 - 59 yrs	1.51	2.07	3.58
60 - 69 yrs	0.77	2.47	3.24
70 - 79 yrs	0.21	2.48	2.69
80+yrs	0.07	1.67	1.74
Total: All Persons	0.92	2.29	3.21

Figure 12
Person Trip Rates by Age Group



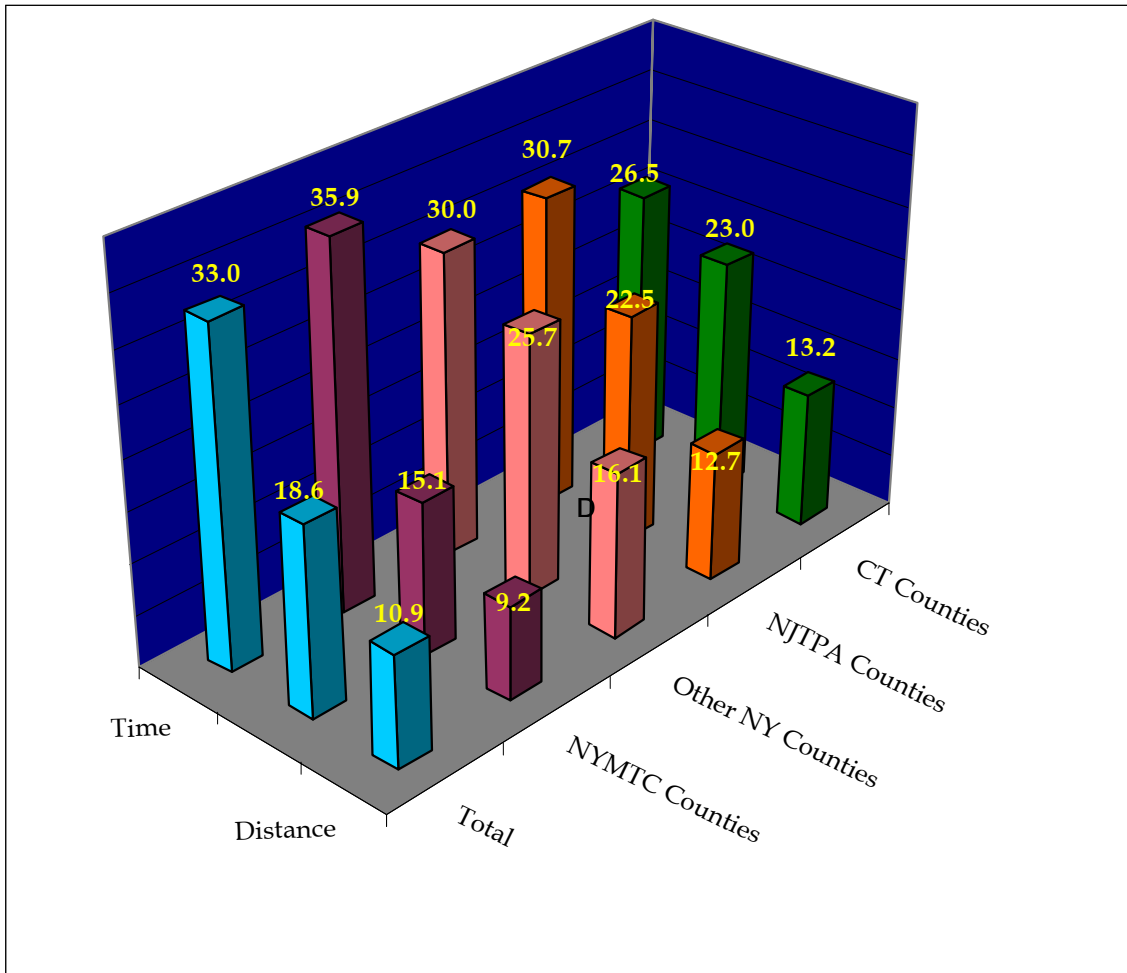
4.2.5 Travel Distances and Travel Times

Estimated average travel times, distances and derived speed for weekday trips are shown in **Figure 13** and in **Table 40**. The basis for the estimates of these travel parameters in the *RT-HIS* data is discussed in Section 4.1. The average weekday trip takes about 24 minutes, is about 7 miles long and is made at an average speed of about 17 miles per hour (mph). The distance traveled for the average work trip is about twice as long as for the average non-work trip – 10.9 miles vs. 5.6 miles. Work trips are more often vehicle trips, and consequently faster, with an average travel time of 33 minutes, compared to 20 minutes for the average non-work trip. The variation in trip distance, time and speeds across the county groups is shown in the table.

Table 40
Travel Time, Trip Distance, and Estimated Speed for a Trip Type by County Group

County Group	Work Trip			Non-Work Trips			All Weekday Trips		
	Reported Travel Time	Trip Distance	Avg. System Speed	Reported Travel Time	Trip Distance	Avg. System Speed	Reported Travel Time	Trip Distance	Avg. System Speed
Manhattan	28.7	4.3	8.8	24.3	2.7	6.5	25.8	3.3	7.4
Other NYC	42.3	7.2	10.1	26.3	3.8	8.5	30.6	4.7	9.1
Long Island	33.0	13.6	23.7	17.8	6.0	19.2	22.2	8.2	21.2
Mid-Hudson (NYMTC)	31.1	12.8	23.7	17.6	5.4	17.7	21.3	7.5	20.1
Mid-Hudson (Other)	30.0	16.1	29.4	18.9	8.1	23.6	22.0	10.4	25.8
Connecticut	26.5	13.2	28.1	17.8	8.3	25.9	20.4	9.7	26.7
Bergen-Passaic	29.4	11.3	22.4	15.3	6.0	21.9	19.2	7.5	22.1
Essex-Hudson-Union	33.1	9.3	16.5	18.4	4.8	15.4	22.8	6.2	15.8
Middlesex-Morris-Somerset	28.1	13.0	25.5	17.3	7.2	22.5	20.7	9.0	23.8
Monmouth-Ocean	31.2	17.9	31.0	17.9	8.8	25.1	21.4	11.3	27.4
Hunterdon-Sussex-Warren	33.7	18.5	29.9	18.5	8.9	24.7	23.1	11.9	27.0
Mercer	27.0	13.0	24.5	16.0	5.8	17.9	19.2	7.9	20.6
Total	33.0	10.9	19.0	20.3	5.6	15.6	23.9	7.1	16.9

Figure 13
Trip Distance, Average Speed and Travel Time – by County Group: Work Trips



4.2.6 Time of Day and Other Variations in Travel

Table 41 shows the average person trip rate (all persons – regardless of work status) by day of week, corresponding to the “assigned travel day” for respondents in the *RT-HIS*. Similar to count data typical of roadway and transit ridership in the region, this indicates Wednesday and Thursday as the highest travel days of the week. The greatest day-to-day variation is for work travel, with non-work travel more uniform, but in fact higher than the average on Thursday and Friday when work travel rates are the lower than the average.

Table 41
Trips per Person (Person Trip Rates) - by Day of the Week

Day of Week	Work Trip	Non-Work	Total: Weekday
Monday	0.93	2.26	3.19
Tuesday	0.87	2.20	3.07
Wednesday	1.03	2.19	3.22
Thursday	0.93	2.35	3.28
Friday	0.84	2.34	3.18
Total: All Weekdays	0.91	2.27	3.18

The distribution of weekday trips by general time period for County groups is displayed in **Figure 14** and **Table 42**. Over half of weekday travel occurs in either of the two peak periods - 25.7% in the AM peak four hours, and a slightly higher 27.1 % in the PM peak period. The shares of trips by time of day are fairly uniform across the region.

Table 42
Percentage of Trips in a Travel Period for a County Group

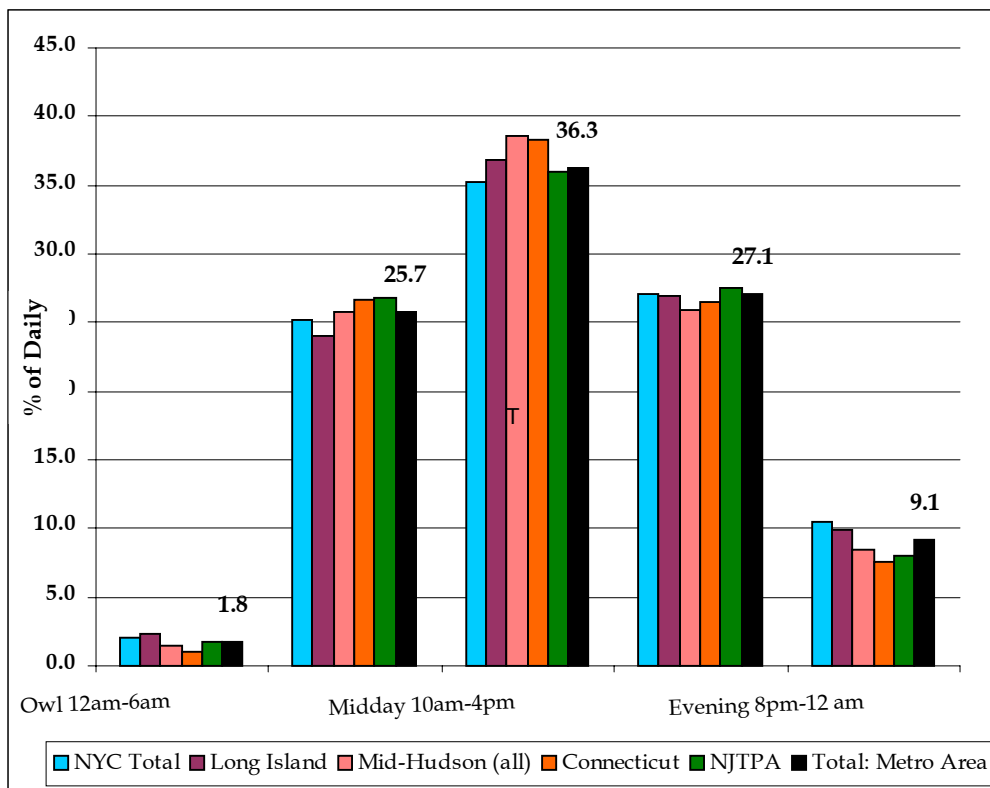
Travel Period	County Groups						
	NYC Total	Long Island	Mid-Hudson (all)	Connecticut	NJTPA	Mercer	All County Groups
Owl 12am-6am	2.0	2.3	1.4	1.0	1.7	1.6	1.8
AM Peak 6-10am	25.2	24.0	25.7	26.6	26.8	26.1	25.7
Midday 10am-4pm	35.2	36.8	38.5	38.3	36.0	33.7	36.3
PM Peak 4-8 pm	27.1	27.0	25.9	26.5	27.5	30.9	27.1
Evening 8pm-12 am	10.5	9.9	8.5	7.6	8.0	7.8	9.1
Total: Weekday	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 43 shows that there is variation, however, in weekday travel by time of day by general origin-destination markets, with share of longer trips to places outside the county of origin higher in the peak periods than for within-County travel, particularly for the PM peak four hours.

Table 43
Percentage of Trips in a Travel Period based on Origin

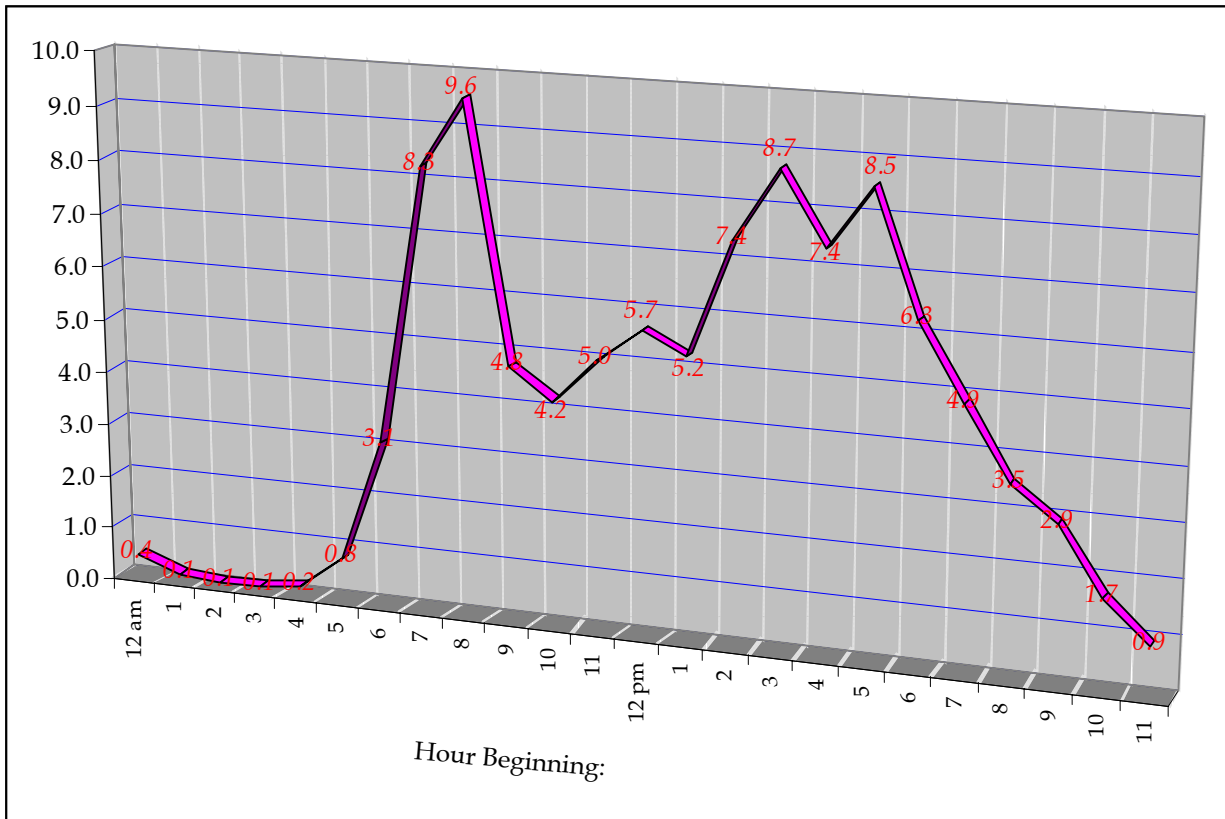
Travel Period	Within County	To Adjoining County (not NYC)	To Manhattan	To Other NYC	To Other NTJPA County	To Other NYMTC County	To Other in Metro Area	Out of Metro Area
Owl 12am-6am	1.2	2.5	5.5	4.2	2.6	4.2	2.5	4.8
AM Peak 6-10am	24.7	28.5	59.7	17.7	18.4	26.5	15.2	24.6
Midday 10am-4pm	38.8	29.8	20.1	27.2	27.8	27.2	35.0	38.2
PM Peak 4-8 pm	26.3	30.9	10.1	38.2	36.5	32.2	33.0	25.6
Evening 8pm-12 am	8.9	8.3	4.5	12.7	14.7	9.8	14.3	6.8
Total: Weekday	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 14
Percentage Travel by Time Period - Metro Area



In **Figure 15** the hourly diurnal pattern of total weekday travel is shown.

Figure 15
Diurnal Distribution of Weekday Trips - Metro Area



4.3 Travel by Different Types of Households

The *RT-HIS* data provides many opportunities to explore how travel patterns vary with respect to household characteristics and structure. The most important of these are examined in this section of the report.

4.3.1 Household size

As shown in **Table 44** the mean average household size in the *RT-HIS* is 2.61 persons. Somewhat more than one-half (55.2%) of the households are 1 or 2 person units, with about one-third (34.5%) of households either 3 or 4 person. Only about 1 in 10 of the region's households are 5 persons or larger. The average household in New York City is smaller than in other parts of the metro area, with over half of Manhattan households single person units.

Table 44
Households by County Group by Household Size (Row Percents)

County Group	Household Size					Total	Mean Size
	1 Person	2 Person	3 Person	4 Person	5+ Person		
Manhattan	47.2	28.5	11.0	8.9	4.4	100.0	1.96
Other NYC	27.4	27.2	17.4	16.0	12.1	100.0	2.64
Long Island	16.3	29.0	19.5	22.0	13.3	100.0	2.92
Mid-Hudson (NYMTC)	21.5	30.8	18.2	18.8	10.7	100.0	2.70
Mid-Hudson (Other)	22.8	29.4	18.5	17.8	11.6	100.0	2.69
Connecticut	24.4	31.7	18.1	17.1	8.8	100.0	2.56
Bergen-Passaic	21.0	31.8	20.5	18.8	7.9	100.0	2.64
Essex-Hudson-Union	25.4	28.9	19.9	16.3	9.5	100.0	2.60
Middlesex-Morris-Somerset	21.4	30.6	17.6	20.8	9.6	100.0	2.70
Monmouth-Ocean	26.2	31.4	13.4	17.3	11.6	100.0	2.60
Hunterdon-Sussex-Warren	13.4	36.1	20.1	21.6	8.8	100.0	2.80
Mercer	24.7	31.3	18.1	18.1	7.8	100.0	2.55
Total: Metro Area	25.8	29.4	17.4	17.1	10.3	100.0	2.61

Table 45 shows the variation in total weekday household trips rates by household size for each of the major County groups. Trip rates increase in a reasonably consistent pattern across sub-areas of the region with larger household size, ranging from a low of 3.3 for 1 person households to 16.1 for 5 person or larger households.

Table 45
Total Trip Rate by Household Size and County Group

County Group	Household Size					
	1 Person	2 Person	3 Person	4 Person	5+ Person	Total
Manhattan	3.8	6.7	9.3	12.8	15.7	6.5
Other NYC	3.0	5.6	8.8	10.4	12.7	7.1
Long Island	3.6	6.8	10.6	15.2	16.9	10.2
Mid-Hudson (NYMTC)	3.5	6.8	9.9	15.2	19.1	9.5
Mid-Hudson (Other)	3.5	6.9	10.4	14.3	16.0	9.1
Connecticut	3.1	6.7	9.7	14.7	17.3	8.7
Bergen-Passaic	3.5	6.6	10.3	14.7	21.1	9.4
Essex-Hudson-Union	2.9	6.4	9.2	12.4	16.5	8.0
Middlesex-Morris-Somerset	3.1	6.9	10.2	13.8	19.3	9.3
Monmouth-Ocean	2.9	6.6	9.8	13.6	18.2	8.6
Hunterdon-Sussex-Warren	3.3	6.7	9.4	13.3	19.3	9.3
Mercer	3.0	6.8	10.2	15.1	21.9	9.1
Total: Metro Area	3.3	6.4	9.6	13.2	16.1	8.3

Trip rates for households of different sizes are displayed in **Table 46** by the general type of trip -- work / non-work, vehicle, transit and total. The work trip rate is at its maximum with 3 person households, and does not increase further with larger households. On the other hand non-work travel does vary proportionately to the number of persons in the household. Similarly, transit trip rates do not increase as much with respect to household size as total vehicle trips. The rate of transit trips for 5 plus households being less than three times that of 1 person households, while the vehicle trip rates for the largest households is more than 5 times that of the single person units.

Table 46
Trip Rates by Household Size

Household Size	Work Trip Rate	Non-Work Trip Rate	Vehicle Trip Rate	Transit Trip Rate	Total Trip Rate
1 Person	1.2	2.1	2.5	0.7	3.3
2 Person	2.2	4.2	5.5	0.9	6.4
3 Person	3.2	6.4	8.3	1.2	9.6
4 Person	3.2	10.0	11.3	1.1	13.2
5+ Person	3.2	12.9	13.9	1.6	16.1
Total: All Households	2.4	5.9	7.1	1.0	8.3

4.3.2 Income

The distribution of reported household incomes in the *RT-HIS* is found in **Table 47**. Considerable variation across regions is shown. About one-quarter (23.7%) of the respondents were unwilling to report their income as part of their participation in the survey.

Table 47
Percent of Households per County Group by Income

County Group	Below \$25K	\$25 - 49K	\$50 - 74K	\$75 - 99K	\$100 - 149k	\$150 +	Not Given	Total
Manhattan	17.4	17.9	14.6	8.9	7.6	9.1	24.5	100.0
Other NYC	26.5	21.7	13.6	7.1	5.2	2.2	23.7	100.0
Long Island	11.7	17.0	17.7	12.6	12.6	4.9	23.5	100.0
Mid-Hudson (NYMTC)	13.0	17.0	14.7	12.0	12.0	8.6	22.7	100.0
Mid-Hudson (Other)	17.4	21.7	20.7	7.9	5.3	1.3	25.7	100.0
Connecticut	18.1	21.5	16.7	9.5	7.9	3.4	22.9	100.0
Bergen-Passaic	13.1	22.7	16.0	11.6	8.8	4.4	23.3	100.0
Essex-Hudson-Union	20.6	19.2	14.3	7.8	8.2	3.6	26.2	100.0
Middlesex-Morris-Somerset	13.2	17.6	18.1	13.7	11.3	5.5	20.5	100.0
Monmouth-Ocean	16.7	18.4	17.7	10.0	9.8	2.8	24.6	100.0
Hunterdon-Sussex-Warren	10.8	16.9	21.5	14.4	10.8	4.6	21.0	100.0
Mercer	17.6	20.6	17.0	10.9	9.1	2.4	22.4	100.0
Total: Metro Area	18.7	19.7	15.7	9.7	8.3	4.3	23.7	100.0

Total weekday trips rates do vary substantially by household income as shown in **Table 48**, with rates of travel generally increasing with higher income levels. The only exception to this pattern is for the highest income category of \$150,000 or more per year. While the average trip rates for this group (10.6) is about 25% higher than the average for all households (8.3), it is lower than for the \$75,000 to \$150,000 group. The highest rate of trip-making (12.5) is more than double that of the 5.3 average trips made by the lowest income group. The trip rate of the “non-reporting” households (7.3) is about 12 percent lower than the overall average.

Table 48
Total Trip Rate by Income

Income	Trip Rate
Below \$25K	5.3
\$25 - 49K	7.6
\$50 - 74K	9.7
\$75 - 99K	11.0
\$100 - 149k	12.5
\$150 +	10.6
Not Given	7.3
Total	8.3

The trip rates for households of different income ranges are displayed in **Table 49** by the general model of travel. Variations in travel by income are even clearer in this exhibit than in the prior one. For example, the highest rate of auto driver trips occur with the \$100,000-\$150,000 groups (7.0 auto driver trips), more than 4 times the rate of the lowest income group (1.5). Conversely, transit trip rates are the highest for this low income group (1.7 auto driver trips).

Table 49
Trip Rates by Type and Income

Income	Total Trip Rate	Vehicle Trip Rate	Auto Driver	Transit Trip Rate	Walk (only)
Below \$25K	5.3	3.9	1.7	1.1	1.4
\$25 - 49K	7.6	6.3	3.6	0.9	1.3
\$50 - 74K	9.7	8.6	5.2	0.8	1.2
\$75 - 99K	11.0	9.7	6.0	1.0	1.3
\$100 - 149k	12.5	11.3	7.0	0.9	1.2
\$150 +	10.6	9.2	5.3	1.2	1.4
Not Given	7.3	6.2	3.5	1.0	1.1
Total: All Households	8.3	7.1	4.1	1.0	1.2

The distribution of mode of travel by income range (for households reporting) is displayed in **Table 50**.

Table 50 Main Mode of Travel by Income

Main Mode of Travel	Income						Total
	Below \$25K	\$25 - 49K	\$50 - 74K	\$75 - 99K	\$100 - 149k	\$150 +	
Commuter Rail	11.0	11.5	18.1	15.7	29.1	14.7	100.0
Ferry	3.4	27.3	28.4	18.2	5.7	17.0	100.0
PATH	5.9	31.2	29.7	18.8	10.4	4.0	100.0
Express Bus	8.4	23.0	19.6	17.4	12.1	19.6	100.0
Subway (NY)	25.3	26.2	19.0	14.7	9.1	5.8	100.0
LRT (Newark)	21.4	21.4	35.7		14.3	7.1	100.0
Inter-City	14.8	7.4	7.4	13.0	35.2	22.2	100.0
Airport Service	18.2	9.1	36.4		27.3	9.1	100.0
Charter Bus	58.1	9.7	16.1		9.7	6.5	100.0
School Bus	9.2	19.8	27.3	18.6	17.7	7.5	100.0
Local Bus	42.8	27.0	13.4	8.0	5.9	3.0	100.0
Contract Bus	22.7	22.7	27.3	4.5	13.6	9.1	100.0
Shuttle-Commute Van	50.0	21.4	19.0	7.1	2.4		100.0
Yellow-Medallion Taxi	23.3	10.7	19.5	9.0	14.0	23.5	100.0
For Hire Van-Jitney	10.5	73.7		10.5		5.3	100.0
Car Service-Black	33.9	1.7	11.9	22.0	11.9	18.6	100.0
Gypsy Cab	34.0	10.0	2.0		54.0		100.0
Motorcycle-Moped	100.0						100.0
Auto Driver	9.8	22.0	25.2	17.8	18.2	7.1	100.0
Auto Passenger	11.8	23.2	24.7	16.7	17.3	6.3	100.0
Bicycle	31.0	11.4	26.3	14.9	14.9	1.4	100.0
Skates	38.9	5.6	16.7	38.9			100.0
Wheelchair	100.0						100.0
Other	22.4	29.3	15.5	11.2	4.3	17.2	100.0
Walk (only)	26.6	26.1	18.6	12.4	10.2	6.0	100.0
Total	15.0	22.9	23.2	16.2	15.9	6.9	100.0

4.3.3 Vehicle Ownership

The volume and patterns of travel also vary considerably in the region based on the number of automobiles or private vehicles available for use by members of the households.

This distribution of vehicle ownership reported by households in the RT-HIS is shown in **Table 51**, by each of the County groups. Almost one-quarter (23.5%) of the region’s households are “car less” or zero car households, more than two-thirds (69.2%) of Manhattan, and two-fifths (40.4%) of other New York City households. The average number of vehicles available to households in the overall region is 1.43 vehicles per household, with the average closer to 2 vehicles per household in most parts of the region outside New York City, except for Essex, Hudson, and Union counties in New Jersey.

Table 51**Distribution of Households by Vehicle Ownership by County Group (Row Percents)**

County Group	Zero Vehicles	1 Vehicle	2 Vehicles	3 Vehicles	4+Vehicles	Total	Mean Average Vehicles
Manhattan	69.2	25.1	4.3	1.2	0.2	100.0	0.38
Other NYC	40.4	37.7	16.4	3.9	1.5	100.0	0.89
Long Island	5.1	23.3	46.2	16.5	8.9	100.0	2.05
Mid-Hudson (NYMTC)	8.1	30.5	42.5	12.6	6.2	100.0	1.84
Mid-Hudson (Other)	11.9	25.4	39.3	14.9	8.6	100.0	1.89
Connecticut	6.1	30.0	44.1	15.3	4.4	100.0	1.85
Bergen-Passaic	6.4	31.1	44.8	14.0	3.7	100.0	1.81
Essex-Hudson-Union	17.5	38.5	31.5	8.9	3.6	100.0	1.46
Middlesex-Morris-Somerset	5.8	26.9	46.1	14.5	6.7	100.0	1.94
Monmouth-Ocean	7.4	31.4	41.3	13.7	6.2	100.0	1.85
Hunterdon-Sussex-Warren	2.1	19.0	45.6	22.6	10.8	100.0	2.27
Mercer	10.8	29.3	41.3	13.2	5.4	100.0	1.77
Total: Metro Area	23.5	31.3	31.1	9.9	4.2	100.0	1.43

The average number of vehicles per household, stratified by both income and household size is presented in **Table 52**. The pattern revealed is one that is stable and consistent with our expectations and with vehicle ownership models for metropolitan areas -- rates of car ownership increase with both income and household size.

Table 52**Number of Vehicles by Household Size and Income**

Income Group	Household Size					Total
	1 Person	2 Person	3 Person	4 Person	5+ Person	
Below \$25K	0.50	0.91	0.86	0.85	0.87	0.69
\$25 - 49K	0.80	1.31	1.57	1.49	1.73	1.26
\$50 - 74K	0.91	1.69	2.10	2.04	2.13	1.77
\$75 - 99K	0.87	1.83	2.06	2.25	2.41	1.97
\$100 - 149k	0.89	1.90	2.24	2.29	2.87	2.18
\$150 +	1.12	1.89	2.26	2.55	2.49	2.16
Not Given	0.55	1.28	1.64	1.93	1.68	1.30
Total: Metro Area	0.65	1.43	1.77	1.93	1.95	1.43

Table 53 shows rates of vehicle availability by each County Group, again stratified by household size.

Table 53
Number of Vehicles by Household Size and County Group

County Group	Household Size					Total
	1 Person	2 Person	3 Person	4 Person	5+ Person	
Manhattan	0.19	0.53	0.64	0.59	0.51	0.38
Other NYC	0.45	0.90	1.01	1.26	1.17	0.89
Long Island	0.99	1.82	2.36	2.41	2.78	2.05
Mid-Hudson (NYMTC)	0.96	1.82	2.19	2.19	2.44	1.84
Mid-Hudson (Other)	0.76	1.89	2.30	2.48	2.62	1.89
Connecticut	0.97	1.90	2.34	2.25	2.33	1.85
Bergen-Passaic	0.96	1.78	2.08	2.23	2.50	1.81
Essex-Hudson-Union	0.73	1.42	1.81	1.99	1.85	1.46
Middlesex-Morris-Somerset	0.98	1.86	2.42	2.39	2.47	1.94
Monmouth-Ocean	0.99	1.84	2.29	2.29	2.65	1.85
Hunterdon-Sussex-Warren	1.30	2.17	2.48	2.65	2.70	2.27
Mercer	0.93	1.67	2.14	2.22	2.96	1.77
Total: Metro Area	0.65	1.43	1.77	1.93	1.95	1.43

Table 54 indicates that rates of vehicle ownership are substantially higher for the population that has resided in the same residence for 5 years or more (1.6 vehicles), than for new residents (1.0 vehicles) less than one year at their current residence.

Table 54
Number of Vehicles by Household Size and Year Moved in

Year Moved In	Household Size					Total
	1 Person	2 Person	3 Person	4 Person	5+ Person	
Within past year	0.50	1.11	1.14	1.46	1.28	0.95
1 to 5 years ago	0.66	1.29	1.42	1.56	1.76	1.25
More than 5 years ago	0.67	1.52	2.03	2.13	2.09	1.56
Total: All Households	0.65	1.43	1.77	1.93	1.96	1.43

The affect of vehicle ownership on travel is explored in the following tables in this section.

In **Table 55** it is shown that total weekday trip rates increase with both household size and the number of vehicles owned. Total trip rates for 3 vehicle households (11.4) is more than twice that of zero car household (5.2).

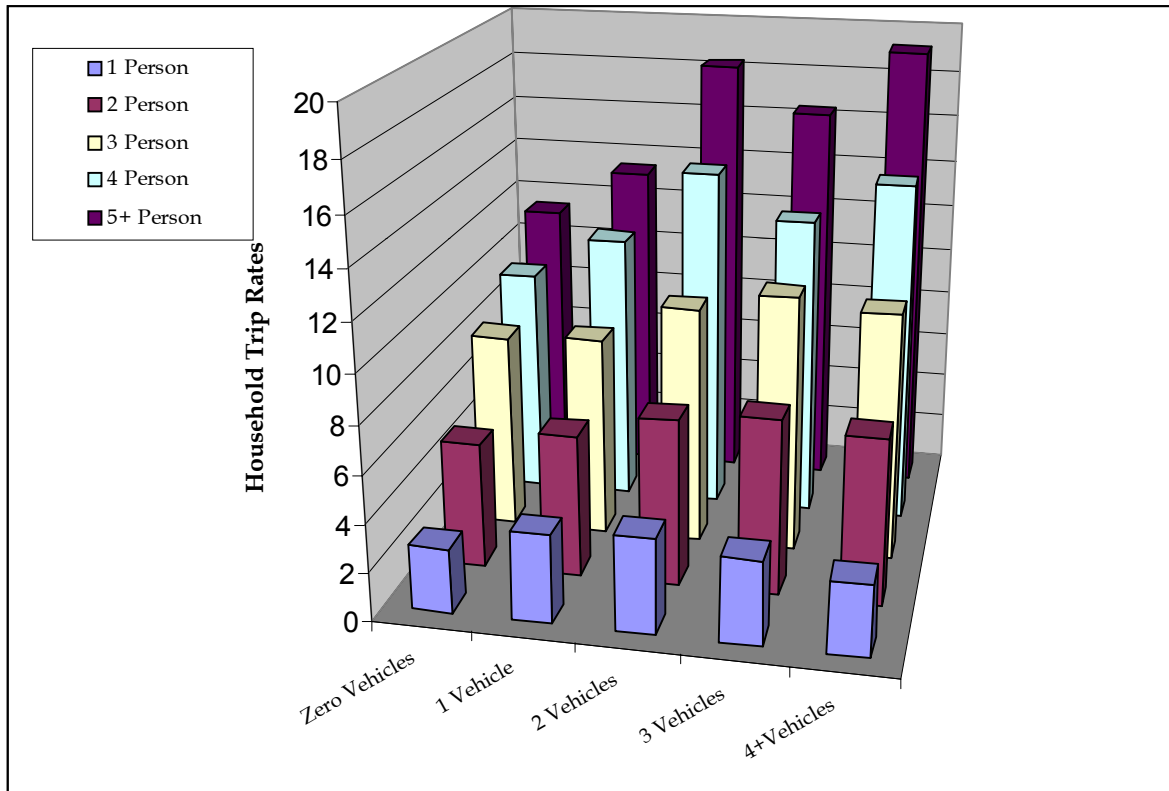
Table 55

Total Trip Rate by Household Size and Number of Vehicles

Number of Vehicles	Household Size					Total
	1 Person	2 Person	3 Person	4 Person	5+ Person	
Zero Vehicles	2.7	5.3	8.3	9.7	11.4	5.2
1 Vehicle	3.7	6.0	8.5	11.5	13.4	6.5
2 Vehicles	4.0	7.0	10.1	14.6	18.3	10.8
3 Vehicles	3.5	7.4	10.9	12.8	16.4	11.4
4+ Vehicles	3.0	7.0	10.5	14.6	19.2	13.2
Total: All Households	3.3	6.4	9.6	13.2	16.1	8.3

Figure 16

Total Trip Rate by Household Size and Number of Vehicles



At the same time, as shown in **Table 56** transit trip rates are highest (1.9) for households with no cars, and decrease with the number of vehicles available. The rate of walk trips (2.2) is about 3 times higher for zero-car households than for households with two vehicles (0.8), and 4 times higher than for those with four or more (0.6).

Table 56
Total Trip Rate by Number of Vehicles per Household

Number of Vehicles per Household	Total Trip Rate	Vehicle Trip Rate	Auto Driver	Transit Trip Rate	Walk (only)
Zero Vehicle HH	5.2	2.9	0.2	1.9	2.2
1 Vehicle	6.5	5.2	2.8	0.9	1.3
2 Vehicles	10.8	10.0	6.3	0.5	0.8
3 Vehicles	11.4	10.8	7.7	0.4	0.6
4+ Vehicles	13.2	12.6	9.5	0.4	0.6
Total: All Households	8.3	7.1	4.1	1.0	1.2

The distribution of mode of travel by vehicle ownership is displayed in **Table 57**.

Table 57 Main Mode of Travel by Vehicle Ownership

Main Mode of Travel	Number of Vehicles					Total
	Zero Vehicles	1 Vehicle	2 Vehicles	3 Vehicles	4+ Vehicles	
Commuter Rail	7.9	25.6	47.5	12.9	6.1	100.0
Ferry	10.4	45.3	33.0	9.4	1.9	100.0
PATH	27.8	50.2	16.7	4.2	1.1	100.0
Express Bus	14.5	35.8	30.5	15.5	3.8	100.0
Subway (NY)	53.3	32.0	12.0	2.1	0.6	100.0
LRT (Newark)	37.5	37.5	25.0			100.0
Inter-City	4.3	32.9	34.3	22.9	5.7	100.0
Airport Service	22.7	40.9	4.5	31.8		100.0
Charter Bus	48.7	30.8	10.3	10.3		100.0
School Bus	7.6	15.4	54.0	17.5	5.5	100.0
Local Bus	59.5	27.4	8.0	3.0	2.1	100.0
Contract Bus	29.5	15.9	43.2	9.1	2.3	100.0
Shuttle-Commute Van	19.3	68.4	7.0	1.8	3.5	100.0
Yellow-Medallion Taxi	57.1	29.6	10.2	2.0	1.1	100.0
For Hire Van-Jitney	59.1	18.2	13.6	9.1		100.0
Car Service-Black	67.1	14.3	11.4	7.1		100.0
Gypsy Cab	32.7	65.5			1.8	100.0
Motorcycle-Moped	100.0					100.0
Auto Driver	0.9	22.0	48.5	18.8	9.9	100.0
Auto Passenger	6.9	22.4	51.4	13.5	5.8	100.0
Bicycle	26.3	35.1	33.1	1.7	3.7	100.0
Skates	30.4	17.4	52.2			100.0
Wheelchair	69.2	23.1			7.7	100.0
Other	37.8	23.6	35.8	2.7		100.0
Walk (only)	41.8	31.8	19.7	4.5	2.2	100.0
Total	14.6	24.5	40.7	13.6	6.7	100.0

4.3.4 Household Structure

In this section, the structure of households and its effect on travel is examined. Of particular interest and importance for travel are the number of children in the household, and the number of working family members.

Table 58 shows the distribution of households in each County Group by the number of children, here defined to be persons under 21 years of age. There are no children residing at six out of 10 (60.1%) of the households in the region. One child is living in about 15% of households, two in another 16% and three or more in 8% of the region's households.

Table 58 Household Structure by County Group - Number of Children

County Group	Household Structure 3				
	3+ Child (<21)	2 Child	1 Child	No Child	Total
Manhattan	4.2	9.3	10.4	76.1	100.0
Other NYC	9.8	16.4	17.1	56.7	100.0
Long Island	8.4	19.0	16.0	56.5	100.0
Mid-Hudson (NYMTC)	8.6	16.8	16.2	58.5	100.0
Mid-Hudson (Other)	8.6	17.5	16.5	57.4	100.0
Connecticut	7.2	18.2	14.1	60.5	100.0
Bergen-Passaic	6.5	18.9	16.6	58.0	100.0
Essex-Hudson-Union	8.2	15.0	15.8	61.0	100.0
Middlesex-Morris-Somerset	8.4	18.3	15.0	58.4	100.0
Monmouth-Ocean	10.0	16.4	10.0	63.7	100.0
Hunterdon-Sussex-Warren	7.7	19.5	14.4	58.5	100.0
Mercer	6.6	16.9	15.1	61.4	100.0
Total: Metro Area	8.2	16.5	15.2	60.1	100.0

Table 58 shows the distribution of households in each County Group by the number of workers, including those of full-time or part-time status. More than one-quarter (28.2%) of the area households have no workers, one-third (33.3%) a single full time worker, and somewhat more than one-quarter (28.3%) with two or more full time workers.

Table 59 Household Structure by County Group - Number of Workers

County Group	2+ Full-Time Workers	1 Full-Time & 1+ Parttime	1 Full-Time Worker	Retired or Unemployed	Total
Manhattan	23.2	4.9	41.2	30.6	100.0
Other NYC	24.0	7.0	34.9	34.0	100.0
Long Island	34.7	14.6	28.3	22.3	100.0
Mid-Hudson (NYMTC)	30.1	13.2	32.2	24.5	100.0
Mid-Hudson (Other)	30.0	11.2	28.7	30.0	100.0
Connecticut	27.7	11.4	35.1	25.9	100.0
Bergen-Passaic	29.9	13.6	31.0	25.6	100.0
Essex-Hudson-Union	30.7	10.2	34.0	25.1	100.0
Middlesex-Morris-Somerset	33.4	14.4	31.4	20.8	100.0
Monmouth-Ocean	27.2	10.8	28.6	33.4	100.0
Hunterdon-Sussex-Warren	36.6	13.4	30.9	19.1	100.0
Mercer	34.9	8.4	29.5	27.1	100.0
Total: Metro Area	28.3	10.2	33.3	28.2	100.0

The joint or combined distribution of the number of children and number of workers for County groups is shown in **Table 60**. About one-quarter (23.1%) of all households are without either workers or children. The next most common type of household is however, one with two or more workers and with children (21.5%). Single worker, no children households represent 20% of area households). About one in eight (13.3%) households can be classified as one worker with children. One in twenty households (5.1%) is one with children, and no worker.

Table 60
Household Structure (Workers / Children) by Income (% of Total)

County Group	Household Structure(C)						Total
	2+ Workers w/Child(s)	2+ Workers no Child(s)	1 Worker w/Child(s)	1 Worker no Child(s)	No Worker w/Child(s)	No Worker /no Child(s)	
Manhattan	10.7	17.5	7.6	33.6	5.6	25.1	100.0
Other NYC	18.3	12.7	15.2	19.7	9.8	24.2	100.0
Long Island	29.1	20.3	12.2	16.0	2.2	20.1	100.0
Mid-Hudson (NYMTC)	24.0	19.3	13.6	18.7	4.0	20.4	100.0
Mid-Hudson (Other)	25.1	16.2	15.5	13.2	2.0	28.1	100.0
Connecticut	22.4	16.7	14.3	20.8	2.7	23.0	100.0
Bergen-Passaic	25.5	18.0	13.4	17.5	3.0	22.6	100.0
Essex-Hudson-Union	21.9	19.0	13.6	20.4	3.5	21.6	100.0
Middlesex-Morris-Somerset	26.1	21.7	13.5	17.8	2.2	18.7	100.0
Monmouth-Ocean	21.1	17.0	12.7	15.8	2.5	30.9	100.0
Hunterdon-Sussex-Warren	26.3	23.7	12.9	18.0	2.1	17.0	100.0
Mercer	23.4	19.8	12.0	17.4	3.6	24.0	100.0
Total	21.5	17.1	13.3	20.0	5.1	23.1	100.0

Table 61 shows the joint distribution of *RT-HIS* households by income and the worker/children classification of household structure.

Table 61 Household Structure by Income - Percent of Total

Income	Household Structure(C)						Total
	2+ Workers w/Child(s)	2+ Workers no Child(s)	1 Worker w/Child(s)	1 Worker no Child(s)	No Worker w/Child(s)	No Worker /no Child(s)	
Below \$25K	1.2	0.8	1.9	3.0	2.1	9.6	18.7
\$25 - 49K	3.2	2.6	3.3	6.0	0.6	3.9	19.7
\$50 - 74K	4.3	3.7	2.3	3.5	0.3	1.6	15.7
\$75 - 99K	3.6	2.8	1.2	1.3	0.1	0.6	9.7
\$100 - 149k	3.7	2.5	0.9	0.8	0.1	0.4	8.3
\$150 +	1.4	1.2	0.6	0.7	0.1	0.2	4.3
Not Given	4.2	3.5	3.0	4.7	1.6	6.7	23.7
Total	21.5	17.0	13.3	20.0	5.1	23.1	100.0

The following tables in this section look at the effect of household structure on travel rates and patterns.

Total weekday households trip rates are shown in **Table 62** broken down by number of children living at residence. The rate of work travel is fairly constant with respect to variation in the number of children, while non-work rates are clearly strongly affected by this characteristic of households

Table 62 Household Trip Rates by Purpose by Number of Children

Household Structure	Work Trip	Non-Work	Total: Weekday
3+ Child (<21)	2.6	13.4	16.0
2 Child	3.0	10.5	13.6
1 Child	3.0	6.6	9.6
No Child	2.0	3.5	5.5
Total: All Households	2.4	5.9	8.3

Table 63 displays weekday households trip rates are stratified by number of workers. Here, the rate of work travel is seen to be directly related to the number of workers, while non-work trip rates vary, with the highest rate for one full time / one part time worker households.

Table 63 Household Trip Rates by Purpose by Number of Workers

Household Structure - Workers	Work Trip	Non-Work	Total: Weekday
2+ Fulltime Workers	4.3	6.2	10.6
1 Fulltime & 1+ Parttime	3.4	8.7	12.1
1 Fulltime Worker	2.1	5.8	7.9
Retired or Unemployed	0.4	4.7	5.1
Total: All Households	2.4	5.9	8.3

The combined affect of number of children and workers in the household on weekday trip rates, distinguishing work and non-work is found in **Table 64**.

Table 64 Trip Purpose by Household Structure

Household Structure(C)	Work Trip	Non-Work	Total: Weekday
2+ Workers w/Child(s)	4.0	9.4	13.4
2+ Workers no Child(s)	4.2	3.7	8.0
1 Worker w/Child(s)	2.1	10.3	12.4
1 Worker no Child(s)	2.1	2.9	4.9
No Worker w/Child(s)	0.8	8.8	9.5
No Worker /no Child(s)	0.3	3.8	4.1
Total: All Households	2.4	5.9	8.3

The specific affects of the number of children and the number of workers on trip rates by the mode of travel are displayed in **Table 65** through **Table 67**.

Table 65 Trip Rate by Household Structure (3)

Household Structure 3	Total Trip Rate	Vehicle Trip Rate	Auto Driver	Transit Trip Rate	Walk (only)
3+ Child (<21)	16.0	13.5	5.7	1.5	2.5
2 Child	13.6	11.6	5.9	1.1	1.9
1 Child	9.6	8.2	4.8	1.3	1.4
No Child	5.5	4.6	3.1	0.8	0.8
Total: All Households	8.3	7.1	4.1	1.0	1.2

Table 66 Trip Rate by Household Structure - Workers

Household Structure - Workers	Total Trip Rate	Vehicle Trip Rate	Auto Driver	Transit Trip Rate	Walk (only)
2+ Full-Time Workers	10.6	9.3	5.8	1.2	1.2
1 Full-Time & 1+ Parttime	12.1	11.0	6.6	0.8	1.2
1 Full-Time Worker	7.9	6.5	3.5	1.0	1.4
Retired or Unemployed	5.1	4.0	2.1	0.7	1.1
Total: All Households	8.3	7.1	4.1	1.0	1.2

Table 67 Trip Rate by Household Structure

Household Structure(C)	Total Trip Rate	Vehicle Trip Rate	Auto Driver	Transit Trip Rate	Walk (only)
2+ Workers w/Child(s)	13.4	11.9	6.7	1.2	1.5
2+ Workers no Child(s)	8.0	7.0	5.1	1.0	0.9
1 Worker w/Child(s)	12.4	10.2	4.7	1.2	2.2
1 Worker no Child(s)	4.9	4.0	2.7	0.8	0.9
No Worker w/Child(s)	9.5	6.7	2.2	1.9	2.8
No Worker /no Child(s)	4.1	3.4	2.1	0.5	0.7
Total: All Households	8.3	7.1	4.1	1.0	1.2

4.3.5 Other Household Characteristics

Table 68 shows weekday trip rates by general mode, broken down by the length of time a household has been living at their current residence. Total Trip rates are somewhat higher for those who have been at the same residence for 5 or more years. Auto drive trip rates, however, are substantially higher – 4.2 for the 5 year plus households, compared to 2.4 for the within the past year group of households.

**Table 68
Trip Rates by Type and Year Moved In**

Year Moved In	Total Trip Rate	Vehicle Trip Rate	Auto Driver Rate	Transit Trip Rate	Walk (only)
Within past year	6.5	5.2	2.5	1.2	1.3
1 to 5 yrs ago	8.3	6.7	3.5	1.1	1.5
more than 5 yrs ago	8.5	7.4	4.5	0.9	1.1
Total: All Households	8.3	7.1	4.1	1.0	1.2

4.4 Variation in Travel by Person Characteristics

In this section, the influence of individual or personal characteristics on travel patterns is examined with the *RT-HIS* data.

4.4.1 Age

The rate of making work trips and other weekday trips varies substantially by the age of the trip-maker as shown in **Table 69**. While the regional (all person) average work trips per person is .9, work trip rates are the highest in the 40-49 year old cohort (1.6 per weekday). Non-Work person trip rates are much more uniform across age groups, with lower than average (2.3) rates indicated for 20 - 39 year olds and for the 80 years and older group.

Table 69
Trips by Age Group

Age Group	Work Trip	Non-Work	Total Trip Rate - Persons
Under 5 yrs	0.0	2.4	2.4
5 - 15 yrs	0.0	2.8	2.8
16 - 20 yrs	0.6	2.4	3.0
21 - 29 yrs	1.3	1.7	3.1
30 - 39 yrs	1.5	2.1	3.5
40 - 49 yrs	1.6	2.3	3.9
50 - 59 yrs	1.5	2.1	3.6
60 - 69 yrs	0.8	2.5	3.2
70 - 79 yrs	0.2	2.5	2.7
80+yrs	0.1	1.7	1.7
Total: All Ages	0.9	2.3	3.2

Table 70 shows the association of age with trip rates by general model of travel.

Table 70
Total Trip Rate by Age

Age	Total Trip Rate - Persons	Vehicle Trip Rate - Persons	Auto Driver	Transit Trip Rate - Persons	Walk (only)
Under 5 yrs	2.4	2.0	0.0	0.1	0.4
5 - 15 yrs	2.8	2.2	0.0	0.2	0.6
16 - 20 yrs	3.0	2.5	1.2	0.5	0.5
21 - 29 yrs	3.1	2.5	1.5	0.6	0.5
30 - 39 yrs	3.5	3.1	2.2	0.5	0.5
40 - 49 yrs	3.9	3.5	2.7	0.5	0.5
50 - 59 yrs	3.6	3.1	2.4	0.4	0.4
60 - 69 yrs	3.2	2.9	2.1	0.3	0.3
70 - 79 yrs	2.7	2.3	1.6	0.2	0.4
80+yrs	1.7	1.4	0.9	0.1	0.3
Total: All Ages	3.2	2.7	1.6	0.4	0.5

The distribution of travel by time of day for each age cohort is displayed in Table 71. Other than a tendency for the elderly to travel outside both the AM and the PM peak periods, a generally uniform pattern is evident across ages.

Table 71
Travel by Time of Day by Age Group

Travel Period	Under 5 yrs	5 - 15 yrs	16 - 20 yrs	21 - 29 yrs	30 - 39 yrs	40 - 49 yrs	50 - 59 yrs	60 - 69 yrs	70 - 79 yrs	80+ yrs	Total
Owl 12am-6am	0.2	0.1	2.9	3.3	2.1	2.2	2.0	1.6	0.3	0.1	1.8
AM Peak 6-10am	25.1	30.8	23.7	25.2	26.7	26.3	24.8	21.5	17.7	18.6	25.7
Midday 10am-4pm	44.1	36.9	35.1	27.9	33.2	31.6	35.6	46.5	58.4	60.2	36.3
PM Peak 4-8pm	25.1	24.6	24.8	29.9	28.8	29.7	29.2	23.5	18.6	16.1	27.1
Evening 8pm-12 am	5.4	7.6	13.5	13.7	9.1	10.2	8.4	6.9	5.1	4.9	9.2
Total: Weekday	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 72 shows the distribution of travel by general purpose by age group.

Table 72
Percentage Trip Purpose for an Age Group (Two Way)

Trip Purpose	Under 5 yrs	5 - 15 yrs	16 - 20 yrs	21 - 29 yrs	30 - 39 yrs	40 - 49 yrs	50 - 59 yrs	60 - 69 yrs	70 - 79 yrs	80+ yrs	Total
Home-Based Work	0.1	0.3	12.7	29.1	25.4	25.3	26.6	14.6	4.4	3.1	18.1
Home-Based School	13.7	45.8	28.7	5.3	1.1	0.8	0.4	0.2	0.2	0.2	10.1
Home-Based Other	64.1	37.3	38.0	34.9	39.8	40.9	37.6	53.0	64.6	72.1	42.6
Work-Based	2.0	1.0	5.4	14.6	17.2	16.6	17.0	10.3	4.5	1.4	11.6
Non-Home or Work-Based	20.0	15.7	15.2	16.1	16.5	16.5	18.3	21.8	26.3	23.2	17.6
Total: Weekday	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

The mode shares within each age group for weekday travel are found in Table 73. This shows that about one-half (49.1%) of trips by school age 5-15 year olds are made as auto passengers, one fifth (20.3%) by school bus, and almost one-quarter (22.2%) as walk trips. Subway use peaks for persons in their “twenties” (12.1%), about double the average share for persons of any age. Auto driving serves about two-thirds of all trips made by persons 30 to 69 years of age. It remains the predominant mode of travel for those over 70 years of age as well.

Table 73
Percentage of Mode for an Age Group

Mode	Under 5 yrs	5 - 15 yrs	16 - 20 yrs	21 - 29 yrs	30 - 39 yrs	40 - 49 yrs	50 - 59 yrs	60 - 69 yrs	70 - 79 yrs	80+ yrs	Total
Auto Drive		0.2	33.6	49.4	63.5	68.2	67.7	66.0	59.8	51.5	48.9
Auto Passenger	73.9	49.1	22.8	11.8	7.2	6.9	7.6	13.8	18.9	23.0	19.5
Commuter Rail	0.0	0.2	1.1	1.7	1.9	1.6	1.9	0.8	0.3	0.1	1.3

4.4.2 Gender

The distribution of weekday travel by each principal mode according to gender is displayed in **Table 74**. There are some striking patterns in this table. Females make slightly more than half of all weekday trips (52.7%). Females represent the large majority of local bus trips (62%), Yellow/Medallion Taxi (58%) and Gypsy Cab (75%), auto passenger (58%). Women and girls represent a smaller but still the majority share of walk trips (54%). Males dominate the travel in Commuter Rail (66%), PATH (60%), Express Bus (58%) and Car Service (68%). Women and men use two major modes, Subway and auto drive, in the virtually the same proportions.

Table 74 Main Mode of Travel by Gender

Main Mode of Travel	Male	Female
Commuter Rail	67.1	32.9
Ferry	50.9	49.1
PATH	60.8	39.2
Express Bus	58.0	42.0
Subway (NY)	49.8	50.2
LRT (Newark)	80.0	20.0
Inter-City	64.7	35.3
Airport Service	50.0	50.0
Charter Bus	51.3	48.7
School Bus	56.0	44.0
Local Bus	38.1	61.9
Contract Bus	50.0	50.0
Shuttle-Commute Van	56.1	43.9
Yellow-Medallion Taxi	40.9	59.1
For Hire Van-Jitney	45.5	54.5
Car Service-Black	71.4	28.6
Gypsy Cab	16.4	83.6
Motorcycle-Moped	0.0	100.0
Auto Driver	48.6	51.4
Auto Passenger	43.1	56.9
Bicycle	77.1	22.9
Skates	95.8	4.2
Wheelchair	50.0	50.0
Other	39.5	60.5
Walk (only)	45.7	54.3
Total	47.4	52.6

As shown in **Table 75**, men and women generally have a similar time of day patterns for their travel, with a somewhat higher share of mid-day trips made by females

Table 75
Percentage of Travel Within a Time Period for a Gender

Travel Period	Male	Female	Total
Owl 12am-6am	2.6	1.0	1.8
AM Peak 6-10am	26.6	25.0	25.7
Midday 10am-4pm	33.8	38.5	36.3
PM Peak 4-8pm	27.2	27.0	27.1
Evening 8pm-12 am	9.9	8.4	9.1
Total: Weekday	100.0	100.0	100.0

4.4.3 Ethnicity

The rates of weekday travel by general mode, for each major ethnic group, are shown in **Table 76**. Both total and auto trip rates are highest for White, Non-Hispanics, 8.9 total and 4.9 auto driver; however, transit trip rates are the lowest for this population 0.7, or slightly less than one-half the rate of other ethnic groups.

Table 76
Trip Rates by Type and Ethnicity

Ethnicity	Total Trip Rate	Vehicle Trip Rate	Auto Driver	Transit Trip Rate	Walk (only)
Black, Non-Hispanic	6.2	4.9	1.9	1.6	1.3
White, Non-Hispanic	8.9	7.9	4.9	0.7	1.1
Asian/Pacific Islander	8.4	6.8	3.1	1.5	1.6
American Indian	8.7	6.0	3.4	1.8	2.7
Hispanic	7.7	5.6	2.2	1.7	2.1
Other	6.8	5.4	2.3	1.5	1.4
Total: All Households	8.3	7.1	4.1	1.0	1.2

The distribution of weekday travel by each principal mode according to ethnicity is displayed in **Table 77**.

Table 77 Main Mode of Travel by Ethnicity

Main Mode of Travel	Ethnicity						Total
	Black, Non-Hispanic	White, Non-Hispanic	Asian/Pacific Islander	American Indian	Hispanic	Other	
Commuter Rail	5.3	78.1	6.6		5.9	4.0	100.0
Ferry	12.7	61.8	4.9	1.0	7.8	11.8	100.0
PATH	16.7	54.1	8.9		11.3	8.9	100.0
Express Bus	11.0	67.1	3.6	0.3	15.1	3.1	100.0
Subway (NY)	21.6	44.8	8.7	0.9	17.1	7.0	100.0
LRT (Newark)	40.0	33.3	13.3		13.3		100.0
Inter-City	5.9	69.1	2.9		20.6	1.5	100.0
Airport Service	4.5	95.5					100.0
Charter Bus	16.7	80.6				2.8	100.0
School Bus	9.9	73.9	3.8	0.3	5.5	6.5	100.0
Local Bus	35.2	34.0	2.3	1.5	18.4	8.5	100.0
Contract Bus	11.4	79.5	2.3			6.8	100.0
Shuttle-Commute Van	47.4	47.4	1.8		1.8	1.8	100.0
Yellow-Medallion Taxi	15.3	56.2	3.8	0.1	17.1	7.5	100.0
For Hire Van-Jitney	4.8	95.2					100.0
Car Service-Black	8.6	82.9	5.7			2.9	100.0
Gypsy Cab	-	-				-	100.0
Motorcycle-Moped			-				100.0
Auto Driver	6.5	82.6	3.0	0.4	4.9	2.5	100.0
Auto Passenger	8.7	76.3	4.6	0.2	7.7	2.7	100.0
Bicycle	6.4	83.4	2.0		7.8	0.3	100.0
Skates		-					100.0
Wheelchair	25.0	33.3		16.7		25.0	100.0
Other	20.1	61.1	0.7		14.6	3.5	100.0
Walk (only)	13.9	59.6	5.2	1.0	15.3	5.1	100.0
Total	10.2	73.2	4.0	0.5	8.4	3.7	100.0

4.4.4 Work and "Life Cycle" Status

Table 78 shows the rates of weekday trip-making by general work or life cycle status. The most active persons are the Part Time workers, with both work trips, and a higher than average number of non-work trips. Full Time workers make the fewest non-Work trips.

Table 78
Trips by Employment Status

Status	Work Trip	Non-Work	Total Trip Rate - Persons
Full-Time Employed	2.0	1.6	3.6
Part-Time Employed	1.4	2.8	4.2
Unemployed	0.1	2.6	2.7
Homemaker	0.1	3.4	3.5
Adult Student	0.1	2.7	2.8
Retired	0.0	2.5	2.6
17-20 years	0.6	2.4	3.0
5-16 years	0.0	2.8	2.8
Under 5 years	0.0	2.4	2.4
Other	0.2	2.3	2.5
Total: All Persons	0.9	2.3	3.2

In **Table 79** trip rates by general mode of travel are shown for persons according to their employment or life cycle status.

Table 79
Total Trip Rate - Persons by Status

Status	Total Trip Rate - Persons	Vehicle Trip Rate - Persons	Auto Driver	Transit Trip Rate - Persons	Walk (only)
Full-Time Employed	3.6	3.1	2.3	0.5	0.4
Part-Time Employed	4.2	3.6	2.8	0.4	0.5
Unemployed	2.7	2.0	1.0	0.6	0.7
Homemaker	3.5	2.9	2.2	0.2	0.6
Adult Student	2.8	2.3	1.0	0.6	0.6
Retired	2.6	2.3	1.5	0.2	0.3

The trip purpose distribution of travel by each of these person categories is displayed in **Table 80**. Over half of the travel by Full Time employed persons is from home to work (18.2%), or from work to home (16.2%), or other travel to and from work (17.1%). Interestingly, a little more than one in five trips by “homemakers” is to serve passengers to (10.0%) or from (11.7%) the home.

Table 80
Trip Purpose by General Work and Life Cycle Status

Trip Purpose	Full-Time Employed	Part-Time Employed	Unemployed	Homemaker	Adult Student	Retired	17-20 years	5-16 years	Under 5 years	Other	Total
Home to Work	18.2	10.8	1.7	0.7	1.3	0.6	7.6	0.3	0.1	3.3	9.5
Home to School	0.3	1.3	1.4	0.3	14.1	0.1	13.8	24.0	7.4	3.1	5.3
Home to Social Recreational	4.3	4.3	7.6	7.3	7.1	10.2	8.7	8.5	12.5	10.6	6.5
Home to Personal Business	3.0	4.7	11.0	7.9	4.3	11.6	3.1	3.6	5.8	10.0	4.9
Home to Shop	2.7	3.5	6.4	7.2	3.6	8.9	3.2	2.3	4.4	4.8	3.9
Home to Serve Pass	3.7	6.0	6.9	12.2	5.8	2.8	2.6	2.2	7.3	5.4	4.4
Home to Other Trip	0.7	0.6	2.6	1.1	0.4	1.7	0.9	0.9	1.5	0.9	0.9
Work to Home	16.3	9.6	1.6	0.6	0.9	0.7	7.5	0.3	0.1	3.0	8.6
School to Home	0.4	1.3	1.1	0.3	12.5	0.1	11.9	21.3	6.3	2.7	4.7
Social Recreational to Home	5.2	4.9	9.5	8.1	8.7	10.5	9.8	10.3	13.8	11.3	7.6
Personal Business to Home	3.1	4.1	9.0	6.6	3.6	8.9	3.1	3.6	5.4	9.4	4.4
Shop to Home	4.0	5.2	8.7	9.9	4.4	11.4	3.3	3.1	6.3	5.9	5.3
Serve Pass to Home	3.1	5.2	5.8	10.4	4.3	2.4	2.3	2.2	5.8	4.9	3.8
Other Trip to Home	0.6	0.8	2.5	1.0	0.7	1.8	0.8	0.8	1.2	0.9	0.9
At Work-Work Related	4.1	2.3	0.1			0.0	1.2	0.0			2.0
At Work-Other	16.8	16.3	0.9	1.6	0.9	0.9	5.2	1.0	2.0	1.6	9.6
Other (non-Home or Work)	13.6	19.2	23.2	24.7	27.3	27.4	14.9	15.7	20.0	22.2	17.5
Total: All Trips	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

The more generalized trip purpose distribution of travel by each of these person categories is displayed in **Table 81**.

Table 81
Percentage Trip Purpose for an Employment Status (Two Way)

Trip Purpose	Full-Time Employed	Part-Time Employed	Unemployed	Homemaker	Adult Student	Retired	17-20 years	5-16 years	Under 5 years	Other	Total
Home-Based Work	34.5	20.4	3.3	1.3	2.2	1.3	15.2	0.5	0.1	6.3	18.2
Home-Based School	0.7	2.5	2.5	0.6	26.6	0.2	25.7	45.3	13.7	5.8	10.0
Home-Based Other	30.4	39.2	70.0	71.8	43.0	70.2	37.8	37.4	64.1	64.1	42.7
Work-Based	20.9	18.6	1.0	1.6	0.9	0.9	6.4	1.1	2.0	1.6	11.6
Non-Home or Work-Based	13.6	19.2	23.2	24.7	27.3	27.4	14.9	15.7	20.0	22.2	17.5
Total: All Trips	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 82 shows how time of day of travel is associated with personal employment or life cycle status.

Table 82
Percentage of Travel Within a Time Period for an Employment Status

Travel Period	Full-Time Employed	Part-Time Employed	Unemployed	Homemaker	Adult Student	Retired	17-20 years	5-16 years	Under 5 years	Other	Total
Owl 12am-6am	2.8	1.6	1.6	0.3	2.0	0.6	3.5	0.2	0.2	2.7	1.8
AM Peak 6-10am	27.9	23.3	22.0	19.6	24.6	17.9	22.6	30.5	25.1	23.7	25.7
Midday 10am-4pm	26.4	40.8	45.0	53.7	39.0	57.3	34.4	37.0	44.1	37.9	36.3
PM Peak 4-8pm	32.1	24.4	23.9	20.8	23.2	18.6	24.7	24.7	25.1	28.8	27.1
Evening 8pm-12 am	10.8	9.8	7.5	5.6	11.3	5.5	14.8	7.7	5.4	6.9	9.1
Total: Weekday	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 83
Percentage of Mode for an Employment Status

Mode	Full-Time Employed	Part-Time Employed	Unemployed	Homemaker	Adult Student	Retired	17-20 years	5-16 years	Under 5 years	Other	Total
Auto Drive	65.3	67.9	39.0	64.1	36.6	58.9	41.7	0.6		40.8	48.9
Auto Passenger	6.8	8.0	10.0	12.2	20.0	19.1	18.7	48.2	73.9	28.6	19.5
Commuter Rail	2.3	0.9	1.0	0.2	1.0	0.4	1.2	0.3	0.0	0.5	1.3
Ferry	0.2	0.0	0.0	0.1		0.1	0.2	0.0		0.2	0.1
Subway & Other Rail	8.3	5.8	10.0	2.0	12.4	1.5	9.7	2.9	3.2	8.4	6.1
Express Bus	0.8	0.1	0.2	0.1	0.5	0.3	0.2	0.0	0.0	0.2	0.4
Local Bus	2.4	3.2	9.3	3.2	5.9	5.0	6.8	4.2	2.4	3.5	3.5
School Bus	0.3	0.1	0.2	0.2	2.5	0.3	2.9	19.8	1.6	0.7	3.5
Taxi or Group Ride	1.5	1.0	2.2	1.4	1.2	1.3	0.9	0.8	1.1	1.5	1.3
Other	0.3	0.5	0.7	0.2		0.3	1.3	0.8	0.2	0.4	0.4
Walk (only)	11.8	12.3	27.5	16.3	19.9	12.9	16.4	22.4	17.5	15.4	15.0
Total: All Modes	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

The share of each specific mode of travel represented by employment and life cycle status is shown in **Table 84**.

Table 84 Main Mode of Travel by General Personal Status

Main Mode of Travel	Full-Time Employed	Part-Time Employed	Unemployed	Homemaker	Adult Student	Retired	17-20 years	5-16 years	Under 5 years	Other	Total
Commuter Rail	2.3	0.9	1.0	0.2	1.0	0.4	1.2	0.3	0.0	0.5	1.3
Ferry	0.2	0.0	0.0	0.1		0.1	0.2	0.0		0.2	0.1
PATH	0.5	0.2	0.3	0.0	1.3	0.0	0.2	0.0	0.1	0.1	0.3
Express Bus	0.8	0.1	0.2	0.1	0.5	0.3	0.2	0.0	0.0	0.2	0.4
Subway (NY)	7.8	5.6	9.7	2.0	11.0	1.5	9.4	2.9	3.1	8.3	5.8
LRT (Newark)	0.0	0.0		0.0	0.1		0.1				0.0
Inter-City	0.1	0.1		0.1	0.2	0.0		0.0	0.1		0.1
Airport Service	0.0		0.1			0.0					0.0
Charter Bus	0.0	0.0				0.1	0.1	0.0	0.0		0.0
School Bus	0.1	0.1	0.2	0.1	2.3	0.1	2.9	19.8	1.5	0.7	3.4
Local Bus	2.4	3.2	9.3	3.2	5.9	5.0	6.8	4.2	2.4	3.5	3.5
Contract Bus	0.1	0.0	0.1			0.1					0.0
Shuttle-Commute Van	0.0	0.0	0.8	0.1		0.2	0.1	0.0			0.1
Yellow-Medallion Taxi	1.1	0.9	0.9	1.1	1.0	0.4	0.6	0.6	0.8	1.4	0.9
For Hire Van-Jitney	0.0		0.0		0.1	0.0					0.0
Car Service-Black	0.1				0.1	0.4		0.0			0.1
Gypsy Cab	0.1		0.2			0.0	0.1	0.0	0.1		0.1
Motorcycle-Moped	0.0										0.0
Auto Driver	65.3	67.9	39.0	64.1	36.6	58.9	41.7	0.6		40.8	48.9
Auto Passenger	6.8	8.0	10.0	12.2	20.0	19.1	18.7	48.2	73.9	28.6	19.5
Bicycle	0.2	0.5	0.7	0.1		0.2	1.3	0.7	0.2	0.4	0.4
Skates	0.0							0.1			0.0
Wheelchair				0.0		0.1		0.0			0.0
Other	0.2	0.1	0.1	0.2		0.3	0.1	0.1	0.2	0.1	0.2
Walk (only)	11.8	12.3	27.5	16.3	19.9	12.9	16.4	22.4	17.5	15.4	15.0
Total: All Modes	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

4.4.5 Variations by Other Person Characteristics

Table 85 compares the mode shares for persons who hold a driver license, with those that do not. Persons with a license, drive for about 70% of their weekday trips. Walking (11%) and Subway (6%) are the next most used methods for this group. For people without a drivers license, walking is the most used mode (34%) followed by auto passenger (22%), Subway (18%) and Local Bus (16%).

Table 85
General Mode of Weekday Travel - By Licensed Driver Status

Mode	Yes	No	Total
Auto Drive	70.8	2.5	60.6
Auto Passenger	8.2	23.7	10.7
Commuter Rail	1.7	1.0	1.6
Ferry	0.1	0.2	0.1
Subway & Other Rail	5.1	16.9	6.9
Express Bus	0.6	0.2	0.5
Local Bus	1.5	15.7	3.6
School Bus	0.3	2.6	0.7
Taxi or Group Ride	1.1	3.3	1.4
Other	0.3	1.0	0.4
Walk (only)	10.3	32.8	13.5
Total: All Modes	100.0	100.0	100.0

Table 86 indicates that persons with driver licenses make a somewhat larger share of their trips during the peak periods than those who cannot drive.

Table 86
Travel by Time Period by Status of Driver License

Travel Period	Yes	No	Total
Owl 12am-6am	2.2	1.9	2.2
AM Peak 6-10am	25.1	23.9	24.9
Midday 10am-4pm	35.0	39.5	35.7
PM Peak 4-8pm	28.0	25.6	27.7
Evening 8pm-12 am	9.7	9.1	9.6
Total: All Modes	100.0	100.0	100.0

Overall, about 3.2 percent of the persons represented in the *RT-HIS* report some form of disability; only about half of these specified one of the major disabilities listed in **Table 87**. About 45% of those reporting a disability (or about 1.4% of total population) reported a specific disability that limits mobility – visual or blind, cane or walker, or wheelchair.

Table 87
Incidence of Disabilities in the Population

Disability	Total Population	Disabled Population
Visual or blind	0.3	8.5
Hearing impaired	0.0	0.8
Cane or walker	0.7	20.5
Wheelchair, non-transferable	0.2	7.7
Wheelchair, transferable	0.1	3.8
Cognitively challenged	0.1	3.1
Other	1.6	48.3
Don't know	0.1	3.2
Refused to specify	0.1	3.9
Total: Any Disability	3.2	100.0
Without Disability	96.8	
All Person	100.0	

Table 88 shows the pattern of mode usage of persons with disabilities.

Table 88
Mode of Travel by Type of Disability - Disabled Only

General Mode of Travel	Visual or blind	Hearing impaired	Cane or walker	Wheel-chair, non-transferable	Wheel-chair, transferable	Cognitively Challenged	Other: Not Specified	Don't know	Refused	Total: All Persons
Auto Drive	23.2	90.3	32.0	5.9	28.9	10.6	37.4	21.7	20.8	32.6
Auto Passenger	39.1	3.2	27.1	43.1	21.1	40.9	18.6	52.2	50.0	25.8
Commuter Rail	0.5						0.3	8.7	5.6	0.5
Ferry	0.9						0.1			0.2
Subway & Other Rail	5.9		2.4		10.5	10.6	3.7	4.3		3.8
Express Bus	0.9		0.2				0.6			0.5
Local Bus	6.4		18.9	3.9		1.5	12.0	8.7	4.2	11.5
School Bus	0.9				7.9	15.2	3.8		6.9	3.0
Taxi or Group Ride	4.5	3.2	1.7	43.1	13.2	1.5	5.3		1.4	5.2
Other	0.9			3.9	7.9	7.6	1.8			1.6
Walk (only)	16.8	3.2	17.7		10.5	12.1	16.5	4.3	11.1	15.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

4.5 Focus on Auto Vehicle Trips

In this and in the following sections of the report, an in-depth profile of each of four main modal types of travel in the region is provided through series of comparable tables for:

- ❑ Auto vehicle trips (Section 4.5)
- ❑ Transit persons trips (Section 4.6)
- ❑ Taxi and other group ride (Section 4.7)
- ❑ Walk and other non-Motorized trips (Section 4.8)

This sub-section focuses on the weekday travel made by residents of the region using the private automobile. The contents of each of the following tables is for those trips which were reported in the *RT-HIS* as “auto driver.” Due to the probability of selection in the sampling process, this is the appropriate group of trips to study for a profile of all auto vehicle trips made by residents of the region.

4.5.1 Origin-Destination Patterns

The general origin-destination pattern of travel for auto vehicle trips is shown in **Table 89**.

Table 89
General Origin-Destination (O/D) Patterns by County of Trip Origin -- by County Group
(Level 1) – Auto Weekday Trips *Row Percents*

County Group	Within County	To Adjoining County (not NYC)	To Manhattan	To Other NYC	To Other NTJPA County	To Other NYMTC County	To Other in Metro Area	Out of Metro Area
Manhattan	30.5			34.1	17.5	15.7	1.7	0.5
Other NYC	69.6		5.8	10.5	10.6	2.6	0.4	0.4
Long Island	84.8	6.9	1.2	5.6	0.3	0.8	0.2	0.1
Mid-Hudson (NYMTC)	80.5	8.4	2.5	4.7	1.7	1.7	0.3	0.2
Mid-Hudson (Other)	86.8	7.4	0.6	0.4	1.6	1.7	0.2	1.3
Connecticut	89.9	6.8	0.3	0.3	0.4	1.4		0.9
Bergen-Passaic	73.5	13.9	1.8	1.2	0.6	8.2	0.6	0.1
Essex-Hudson-Union	66.6	23.2	1.5	1.4	1.3	5.3	0.4	0.2
Middlesex-Morris-Somerset	68.4	22.6	0.6	0.8	1.1	5.7	0.5	0.2
Monmouth-Ocean	83.3	9.9	0.3	0.4	0.6	3.9	1.0	0.6
Hunterdon-Sussex-Warren	68.4	19.1	0.4	0.5	0.9	8.2	0.8	1.8
Mercer	78.7	13.4	0.5	0.4	0.3	4.2	0.3	2.2
Out of Metro Area			1.0	1.7	11.7	21.0	20.0	44.5
Total: County Group	76.0	10.3	1.7	4.2	2.6	3.8	0.6	0.7

4.5.2 Time of Day

Table 90 and Figure 17 display the diurnal distribution of auto vehicle weekday trips in the RT-HIS, by hour of departure. The time of day distribution of auto trips by general time period is shown in Table 91.

Table 90
Diurnal Distribution - Hour of Departing - Auto Weekday Trips

Hour Departing	NYC Total	Long Island	Mid-Hudson (all)	Connecticut	NJTPA	Mercer	Total
0	1.0	0.7	0.3	0.1	0.4	0.3	0.5
1	0.3	0.2	0.1	0.0	0.1	0.2	0.2
2	0.1	0.0	0.1	0.1	0.1	0.1	0.1
3	0.2	0.1	0.1		0.1		0.1
4	0.4	0.2	0.2	0.2	0.3	0.5	0.3
5	0.9	1.4	0.9	0.7	1.1	1.0	1.1
6	4.1	4.0	3.5	4.1	3.9	4.2	3.9
7	8.0	7.3	8.3	9.6	8.3	8.8	8.2
8	9.0	6.6	8.0	7.5	9.3	9.1	8.4
9	5.0	6.3	5.8	5.4	5.4	4.4	5.5
10	3.8	5.1	5.2	5.0	4.6	3.8	4.7
11	4.8	5.5	6.1	5.7	5.4	4.9	5.4
12	5.1	6.6	5.9	5.8	6.0	5.4	5.9
13	5.2	5.1	5.6	6.0	5.3	3.9	5.4
14	5.5	6.4	6.1	7.4	5.7	4.6	6.0
15	7.9	7.3	7.8	7.2	7.5	8.2	7.6
16	8.0	7.7	7.9	8.0	8.1	10.5	8.0
17	7.7	7.8	8.4	9.9	9.0	10.0	8.6
18	5.8	6.7	5.9	5.4	6.3	7.5	6.2
19	5.4	5.0	4.8	4.4	4.8	4.9	4.9
20	4.5	4.3	3.4	2.8	3.0	2.5	3.5
21	3.5	2.7	2.9	2.9	2.8	2.7	2.9
22	2.2	2.0	1.4	0.9	1.7	1.7	1.7
23	1.5	0.9	1.1	1.1	0.9	0.9	1.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 17
Diurnal Distribution - Hour of Departing - Auto Weekday Trips

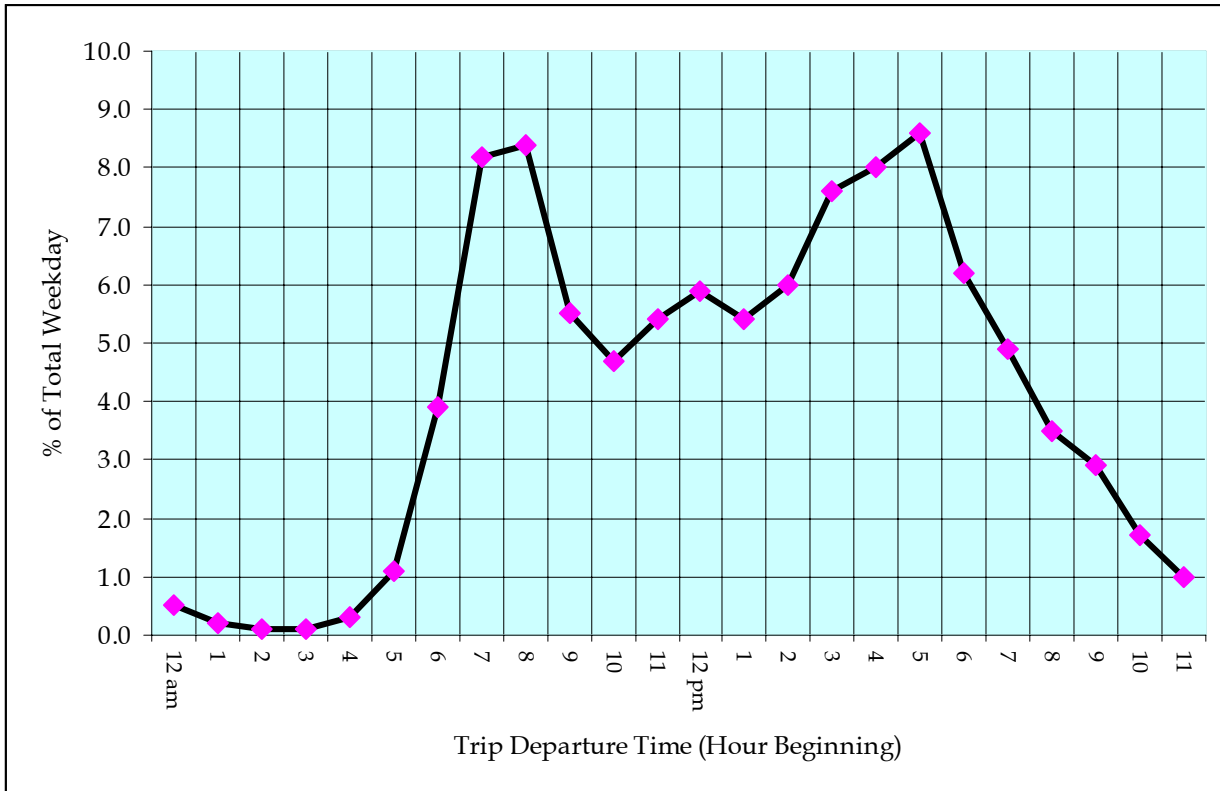


Table 91
Diurnal Distribution - Time Period - Auto Weekday Trips

Time Period	NYC Total	Long Island	Mid-Hudson (all)	Connecticut	NJTPA	Mercer	Total
Owl 12am-	3.0	2.7	1.8	1.1	2.1	2.1	2.2
AM Peak 6-	26.1	24.2	25.6	26.5	26.8	26.4	26.0
Midday	32.3	36.0	36.7	37.0	34.6	30.9	35.0
PM Peak 4-8	27.0	27.1	27.1	27.7	28.2	32.8	27.7
Evening	11.7	10.0	8.8	7.7	8.3	7.7	9.1
Total:	100.00	100.00	100.00	100.00	100.00	100.00	100.00

4.5.3 Purpose of Travel

The distribution of trip purposes of auto vehicle trips is presented in **Table 92**.

Table 92
Trip Purpose- By County Group - Auto Weekday Trips

Trip Purpose	NYC Total	Long Island	Mid-Hudson (all)	Connecticut	NJTPA	Mercer	Total
Home to Work	11.4	11.9	11.2	12.6	12.6	13.2	12.1
Home to School	0.7	0.9	1.0	0.9	1.1	1.0	1.0
Home to Social Recreation	5.9	5.6	4.9	5.7	4.7	3.9	5.2
Home to Personal Business	4.9	4.4	4.9	4.8	4.9	5.1	4.8
Home to Shop	3.8	4.4	4.7	3.5	4.5	4.2	4.3
Home to Serve Pass	6.1	5.8	5.7	6.2	6.1	5.9	6.0
Home to Other Purpose	1.4	1.4	0.7		0.7		0.8
Work to Home	10.2	11.0	10.4	10.5	11.7	12.3	11.0
School to Home	0.7	0.8	0.7	1.0	0.9	0.6	0.9
ocial Recreation to Home	6.7	6.1	5.3	6.6	5.3	5.8	5.8
Personal Business to Home	4.5	4.0	4.5	4.1	4.4	4.5	4.3
Shop to Home	5.4	6.2	6.2	6.3	6.1	5.8	6.0
Serve Pass to Home	5.1	5.0	4.6	4.9	5.5	4.7	5.1
Other Purpose to Home	1.3	1.1	0.8		0.7	0.1	0.8
At Work-Work Related	2.2	3.1	3.4	2.6	2.8	2.8	2.8
At Work-Other	9.8	10.9	12.9	12.4	10.9	12.4	11.2
Other (non-Home or Work)	20.0	17.3	18.2	17.9	17.0	17.9	17.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

4.5.4 Trip Length

Table 93 presents the average reported travel times, trip distance and estimated speed for auto vehicle trips, broken down by County Group of trip origin. The average auto vehicle trip is 8.7 miles long, and takes 21.0 minutes to complete at an average travel speed of 23.3 miles per hour. Auto trips in New York City are shorter (7.7 miles), but slower (16.4 mph) and take longer in time (27.5 minutes).

Table 93
Travel Time, Distance and Estimated Speed- By County Group - Auto Weekday Trips

County Group of Origin	Reported Travel Time	Trip Distance	Avg. System Speed
NYC Total	27.5	7.7	16.4
Long Island	19.5	8.0	23.8
Mid-Hudson (all)	19.6	8.9	25.9
Connecticut	18.2	8.1	25.3
NJTPA	19.9	9.5	26.5
Mercer	18.9	10.2	27.8
Out of Metro Area	46.0	7.0	0.2
Total: Metro Area	21.0	8.7	23.3

The trip length distribution for auto vehicle trips is displayed in **Table 94**, stratified by County Group. About one-quarter (29.3%) of auto trips in the region are in the 1-3 mile range, about one-fifth (19.0%), in the 5-10 mile range, and not quite one-tenth (9.6%) between 3 and 5 miles in length.

Table 94
Trip Distance (Ranges) – By County Group - Auto Weekday Trips

Trip Distance (Miles)	NYC Total	Long Island	Mid-Hudson (all)	Connecticut	NJTPA	Mercer	Total
< .5 Mile	7.6	5.5	6.7	7.5	6.8	5.9	6.8
.5-1 Mile	9.7	10.6	9.7	7.2	9.6	10.9	9.6
1-3 Miles	29.7	28.7	28.4	31.9	29.0	27.8	29.3
3-5 Miles	13.0	10.9	8.0	12.6	6.4	4.1	9.2
5-10 Miles	20.7	18.5	20.5	17.5	18.4	23.6	19.0
10-15 Miles	8.5	9.4	8.9	9.0	10.1	14.7	9.5
15-20 Miles	5.1	4.9	5.3	3.6	6.4	2.9	5.3
20-30 Miles	3.6	5.7	6.2	4.8	6.4	3.7	5.6
30-40 Miles	1.2	2.4	3.1	1.2	3.0	1.6	2.4
40-60 Miles	0.6	2.4	2.0	1.8	2.5	4.1	2.1
60 + Miles	0.2	0.9	1.3	2.8	1.3	0.9	1.2
Total: All Trips	100.0	100.0	100.0	100.0	100.0	100.0	100.0

4.5.5 Vehicle Miles of Travel

The *RT-HIS* provides a basis to estimate the distribution of Vehicle Miles of Travel (VMT) accounted for by the auto travel of residents of the region.

Table 95 shows the estimated distribution of auto VMT by County Group and by trip distance range. This table shows that New York City accounts for about 15% (4.0% Manhattan; 11.1% other NYC) of regional VMT by automobiles. Trips from Long Island account for about 18%. The three counties of Middlesex, Morris, and Somerset in New Jersey represent about 13% of the total. About 21% of auto VMT in the region is associated with relatively long trips – 30 to 60 miles in length.

Table 95
Distribution of Vehicle Miles of Travel (VMT) - By Trip Length -
By County Group of Trip Origin - Auto Weekday Trips

County groups	< 1 Mile	1-5 Miles	5-10 Miles	10-20 Miles	20-30 Miles	30-60 Miles	60 + Miles	Total
Manhattan	0.0	0.2	0.5	1.0	0.9	1.1	0.4	4.0
Other NYC	0.2	1.8	2.3	3.0	1.4	1.7	0.8	11.1
Long Island	0.2	2.2	3.1	4.5	2.8	3.6	1.5	17.9
Mid-Hudson (NYMTC)	0.1	0.8	1.4	1.8	1.5	1.6	0.6	7.9
Mid-Hudson (Other)	0.0	0.4	0.7	0.9	0.4	0.9	1.1	4.5
Connecticut	0.1	1.6	1.7	2.3	1.5	1.5	2.2	10.9
Bergen-Passaic	0.1	1.0	1.5	2.1	1.2	1.7	0.8	8.4
Essex-Hudson-Union	0.1	1.1	1.3	2.0	1.5	1.8	0.5	8.4
Middlesex-Morris-Somerset	0.1	0.8	1.8	3.3	2.3	3.1	1.3	12.9
Monmouth-Ocean	0.1	0.6	0.9	1.8	1.1	2.2	1.5	8.2
Hunterdon-Sussex-Warren	0.0	0.1	0.3	0.8	0.6	1.1	0.6	3.5
Mercer	0.0	0.2	0.4	0.5	0.2	0.6	0.5	2.3
Out of Metro Area	0.0	0.0	0.0	0.0	0.0			0.0
Total	1.1	10.8	15.9	24.1	15.5	21.0	11.7	100.0

Table 96 shows the distribution of resident auto VMT by work and non-Work trip type. Work travel accounts for over half (51.6%) of the total VMT in the region.

Table 96
Distribution of Vehicle Miles of Travel (VMT) - By Work / Non-Work Trip Type -
By County Group of Trip Origin - Auto Weekday Trips

County Group of Trip Origin	Work Trip	Non-Work	Total
Manhattan	2.4	1.6	4.0
Other NYC	5.3	5.9	11.1
Long Island	9.1	8.7	17.9
Mid-Hudson (NYMTC)	4.0	3.9	7.9
Mid-Hudson (Other)	2.0	2.5	4.5
Connecticut	5.6	5.3	10.9
Bergen-Passaic	4.3	4.1	8.4
Essex-Hudson-Union	4.6	3.8	8.4
Middlesex-Morris-Somerset	7.3	5.6	12.9
Monmouth-Ocean	3.9	4.2	8.2
Hunterdon-Sussex-Warren	1.8	1.7	3.5
Mercer	1.2	1.1	2.3
Out of Metro Area	0.0	0.0	0.0
Total	51.6	48.4	100.0

In **Table 97** it can be seen that about two-thirds of auto VMT occurs in the Off-Peak travel times of the day. One-eighth (12.6%) of total weekday areawide VMT occurs from Long Island trips made in the off-peak.

Table 97
Distribution of Vehicle Miles of Travel (VMT) - By Peak / Off-Peak -
By County Group of Trip Origin - Auto Weekday Trips

County Group of Trip Origin	Peak Periods	Off-Peak	Total
Manhattan	1.4	2.7	4.0
Other NYC	3.4	7.7	11.1
Long Island	5.3	12.6	17.9
Mid-Hudson (NYMTC)	2.8	5.1	7.9
Mid-Hudson (Other)	1.4	3.1	4.5
Connecticut	3.8	7.1	10.9
Bergen-Passaic	2.8	5.6	8.4
Essex-Hudson-Union	3.2	5.3	8.4
Middlesex-Morris-Somerset	4.5	8.4	12.9
Monmouth-Ocean	2.7	5.5	8.2
Hunterdon-Sussex-Warren	1.1	2.4	3.5
Mercer	0.7	1.6	2.3
Out of Metro Area	0.0	0.0	0.0
Total	33.1	66.9	100.0

4.5.6 Vehicle Hours of Travel

The *RT-HIS* data also allows for an analysis and summary of the total amount of time spent in transportation by residents of the region on a typical weekday. For auto vehicle trips this is represented as total vehicle hours of travel (VHT).

The distribution of auto vehicle hours of travel by County Group of trip origin, and by trip length range, is found in **Table 98**. More than half of auto VHT occurs with trips less than 10 miles in length, generally slower than longer distance trips.

Table 98
Distribution of Vehicle Hours of Travel (VHT) - By Trip Length -
By County Group of Trip Origin - Auto Weekday Trips

County Group of Origin	< 1 Mile	1-5 Miles	5-10 Miles	10-20 Miles	20-30 Miles	30-60 Miles	60 + Miles	Total
Manhattan	0.1	0.7	1.1	1.3	0.7	0.7	0.2	4.8
Other NYC	1.2	5.5	4.4	3.6	1.4	0.9	0.2	17.2
Long Island	1.1	4.4	4.1	4.2	2.1	1.9	0.3	18.1
Mid-Hudson (NYMTC)	0.6	1.8	1.8	1.5	1.1	0.9	0.2	7.8
Mid-Hudson (Other)	0.2	0.9	0.7	0.8	0.3	0.5	0.2	3.6
Connecticut	0.7	3.5	1.8	1.9	1.0	0.6	0.2	9.8
Bergen-Passaic	0.6	2.1	1.9	2.1	0.8	0.9	0.1	8.4
Essex-Hudson-Union	0.8	2.5	1.9	2.1	1.2	1.0	0.2	9.6
Middlesex-Morris-Somerset	0.5	1.9	2.0	2.9	1.7	1.6	0.2	10.7
Monmouth-Ocean	0.3	1.2	0.9	1.2	0.7	1.2	0.3	5.8
Hunterdon-Sussex-Warren	0.1	0.3	0.3	0.6	0.4	0.5	0.1	2.4
Mercer	0.1	0.3	0.4	0.5	0.2	0.3	0.1	1.8
Out of Metro Area	0.0	0.0	0.0	0.0	0.0			0.0
Total	6.3	25.0	21.2	22.6	11.5	11.0	2.3	100.0

Table 99
Distribution of Vehicle Hours of Travel (VHT) - Work/Non-Work
By County Group of Trip Origin - Auto Weekday Trips

County Group of Trip Origin	Work Trip	Non-Work	Total
Manhattan	2.8	1.8	4.6
Other NYC	6.8	10.1	16.9
Long Island	8.3	9.2	17.5
Mid-Hudson (NYMTC)	3.6	3.9	7.5
Mid-Hudson (Other)	1.6	2.0	3.6
Connecticut	5.0	5.0	10.1
Bergen-Passaic	3.9	4.2	8.2
Essex-Hudson-Union	4.8	4.3	9.1
Middlesex-Morris-Somerset	5.7	4.9	10.6
Monmouth-Ocean	2.9	3.2	6.1
Hunterdon-Sussex-Warren	1.2	1.2	2.4
Mercer	1.0	1.0	2.0
Out of Metro Area	0.3	1.1	1.4
Total	48.0	52.0	100.0

Table 100
Distribution of Vehicle Hours of Travel (VHT) - Peak / Off-Peak
By County Group of Trip Origin - Auto Weekday Trips

County Group of Trip Origin	Peak Periods	Off-Peak	Total
Manhattan	1.5	3.1	4.6
Other NYC	4.9	12.0	16.9
Long Island	5.4	12.1	17.5
Mid-Hudson (NYMTC)	2.7	4.8	7.5
Mid-Hudson (Other)	1.2	2.4	3.6
Connecticut	3.3	6.8	10.1
Bergen-Passaic	2.9	5.3	8.2
Essex-Hudson-Union	3.5	5.6	9.1
Middlesex-Morris-Somerset	3.9	6.6	10.6
Monmouth-Ocean	1.9	4.2	6.1
Hunterdon-Sussex-Warren	0.8	1.6	2.4
Mercer	0.7	1.3	2.0
Out of Metro Area	0.2	1.2	1.4
Total	33.0	67.0	100.0

4.5.7 Vehicle Occupancy - Auto Vehicle Trips

In this section, measures of auto occupancy are estimated and reported for the region with the RT-HIS data.

Table 101 shows the estimated average (mean) number of persons per vehicle for each county group, broken down by trip length range. Vehicle occupancy rates are reasonably uniform, all fairly close to the regional average of 1.40 persons per car on for weekday travel. The table shows that persons per vehicle rates are lower than average for trips in the longer trips in the 10 to 60 mile range (1.29 to 1.23), and highest for the very shortest trips (1.52) for both trips under a mile, and for the longest (1.52), trips over 60 miles in length.

Table 101
Average (Mean) Vehicle Occupancy- By Trip Length -
By County Group of Trip Origin - Auto Weekday Trips

County Group of Origin	< 1 Mile	1-5 Miles	5-10 Miles	10-20 Miles	20-30 Miles	30-60 Miles	60 + Miles	Total
Manhattan	1.57	1.51	1.32	1.34	1.23	1.26	1.29	1.37
Other NYC	1.55	1.45	1.49	1.38	1.44	1.39	1.31	1.46
Long Island	1.49	1.46	1.39	1.22	1.24	1.26	1.35	1.40
Mid-Hudson (NYMTC)	1.53	1.40	1.39	1.28	1.23	1.27	1.64	1.39
Mid-Hudson (Other)	1.48	1.37	1.42	1.35	1.19	1.34	1.33	1.38
Connecticut	1.54	1.33	1.36	1.29	1.10	1.13	1.64	1.35
Bergen-Passaic	1.51	1.47	1.38	1.24	1.15	1.27	1.58	1.41
Essex-Hudson-Union	1.58	1.42	1.39	1.22	1.17	1.33	1.16	1.40
Middlesex-Morris-Somerset	1.56	1.44	1.33	1.29	1.18	1.26	2.41	1.40
Monmouth-Ocean	1.43	1.39	1.32	1.31	1.25	1.23	1.30	1.36
Hunterdon-Sussex-Warren	1.52	1.51	1.41	1.32	1.30	1.28	1.34	1.42
Mercer	1.48	1.35	1.44	1.31	1.35	1.16	1.63	1.39
Out of Metro Area	1.32	1.54	1.00	1.00	1.00			1.24
Total	1.52	1.42	1.39	1.29	1.23	1.27	1.52	1.40

Vehicle occupancy rates by County Group and by Work/non-Work trip type are found in **Table 102**. This exhibit shows that the vehicle occupancy rate for work travel from most subareas is close to the regional average of 1.10. Similarly, there is not a great deal of variation for non-work travel from the regional average of 1.57 persons per vehicle. There is also little variation in auto occupancy rates shown in **Table 103** between Peak and Off-peak travel.

Table 102
Average (Mean) Vehicle Occupancy- By Work / Non-Work -
By County Group of Trip Origin - Auto Weekday Trips

County Group of Trip Origin	Work Trip	Non-Work	Total
Manhattan	1.18	1.57	1.36
Other NYC	1.11	1.63	1.46
Long Island	1.09	1.55	1.39
Mid-Hudson (NYMTC)	1.08	1.55	1.39
Mid-Hudson (Other)	1.08	1.55	1.38
Connecticut	1.08	1.53	1.35
Bergen-Passaic	1.13	1.56	1.41
Essex-Hudson-Union	1.07	1.60	1.40
Middlesex-Morris-Somerset	1.11	1.61	1.40
Monmouth-Ocean	1.05	1.51	1.36
Hunterdon-Sussex-Warren	1.09	1.59	1.41
Mercer	1.09	1.58	1.39
Out of Metro Area	1.17	1.79	1.59
Total	1.10	1.57	1.40

Table 103
Average (Mean) Vehicle Occupancy- By Peak / Off-Peak -
By County Group of Trip Origin - Auto Weekday Trips

County Group of Trip Origin	Peak Periods	Off-Peak	Total
Manhattan	1.30	1.39	1.36
Other NYC	1.42	1.48	1.46
Long Island	1.39	1.39	1.39
Mid-Hudson (NYMTC)	1.38	1.40	1.39
Mid-Hudson (Other)	1.40	1.37	1.38
Connecticut	1.33	1.37	1.35
Bergen-Passaic	1.45	1.39	1.41
Essex-Hudson-Union	1.43	1.38	1.40
Middlesex-Morris-Somerset	1.36	1.42	1.40
Monmouth-Ocean	1.38	1.35	1.36
Hunterdon-Sussex-Warren	1.46	1.39	1.41
Mercer	1.43	1.36	1.39
Out of Metro Area	1.36	1.64	1.59
Total	1.39	1.40	1.40

In **Table 104** through **Table 108** the auto occupancy profile of regional weekday travel is presented with respect to the distribution of persons per vehicle along the same dimensions examined above for average rates of vehicle occupancy. As seen in these tables, about three-quarters (72.5%) of weekday auto trips are made as single occupant, or driver only trips; about one in five (19.2%) with a single passenger, and only 8.3% representing “HOV” auto trips with 3 or more occupants.

Single Occupant Vehicle (SOV) auto trip shares generally increase with trip distance, and are the highest for work travel in the region at 93.7% (see Table 106), and for “Home-Based Work” travel in particular at 96.4% (see Table 107). “HOV” (3 or more) rates are the highest for trips less than a mile - 12.5% (see Table 105); for non-Work trips - 12.0% (see Table 106), and for “Home-Based Other - 11.7% and Non-Home / Non-Work - 12.49 (see Table 107); and for travel made during the evening hours - 12.7% (see Table 108).

Table 104
Distribution of Persons per Vehicle - By County Group of Trip Origin - Auto Weekday Trips

County Group of Trip Origin	Single Occupant	Two Person	Three Person	Four plus	Total: Autos
Manhattan	74.6	18.8	4.6	2.0	100.0
Other NYC	68.2	21.7	7.2	2.9	100.0
Long Island	72.8	19.7	4.7	2.8	100.0
Mid-Hudson (NYMTC)	71.9	20.5	5.2	2.4	100.0
Mid-Hudson (Other)	73.1	19.0	5.6	2.3	100.0
Connecticut	76.1	15.8	5.4	2.6	100.0
Bergen-Passaic	72.1	19.0	6.1	2.8	100.0
Essex-Hudson-Union	71.9	19.6	6.0	2.5	100.0
Middlesex-Morris-Somerset	73.8	18.0	5.3	2.9	100.0
Monmouth-Ocean	74.5	18.8	4.6	2.1	100.0
Hunterdon-Sussex-Warren	72.2	19.1	5.6	3.2	100.0

Table 105
Distribution of Persons per Vehicle - By Trip Length - Auto Weekday Trips

Distance	Single Occupant	Two Person	Three Person	Four plus	Total: Autos
< 1 Mile	65.8	21.7	8.4	4.1	100.0
1-5 Miles	69.8	21.6	6.0	2.6	100.0
5-10 Miles	73.6	18.6	5.2	2.6	100.0
10-20 Miles	79.4	15.5	3.4	1.6	100.0
20-30 Miles	83.4	12.6	2.4	1.6	100.0
30-60 Miles	81.2	13.2	3.5	2.1	100.0
60 + Miles	66.4	23.1	6.4	4.1	100.0
Total	72.5	19.3	5.6	2.6	100.0

Table 106
Distribution of Persons per Vehicle - By Trip Length - Auto Weekday Trips

Trip Purpose	Single Occupant	Two Person	Three Person	Four plus	Total: Autos
1 Work Trip	93.7	4.7	0.9	0.6	100.0
2 Non-Work	60.4	27.5	8.2	3.8	100.0
Total	72.5	19.2	5.6	2.7	100.0

Figure 18
Persons per Vehicle: Work and Non-Work - Auto Weekday Trips

Work

Other (non-Work)

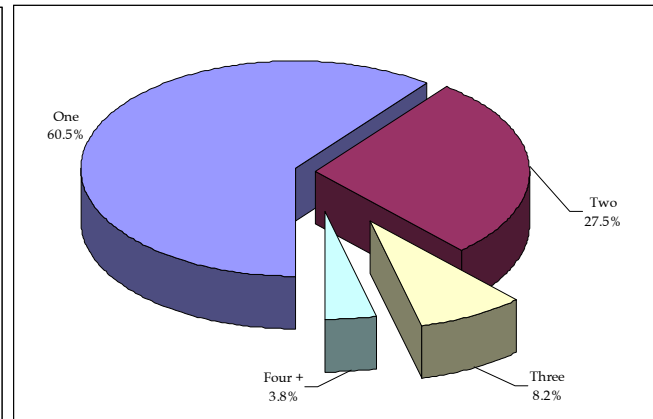
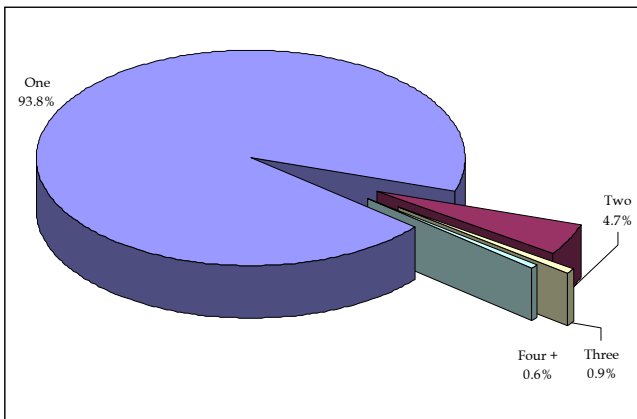


Table 107
Distribution of Persons per Vehicle - By Trip Purpose - Auto Weekday Trips

Trip Purpose	Single Occupant	Two Person	Three Person	Four plus	Total: Autos
1 Home-Based Work	96.4	2.6	0.6	0.4	100.0
2 Home-Based School	88.0	7.8	2.0	2.1	100.0
3 Home-Based Other	61.4	26.9	8.1	3.6	100.0
4 Work-Based	82.3	12.7	2.8	2.1	100.0
5 Non-Home or Work-Based	59.1	28.4	8.5	3.9	100.0
Total	72.5	19.2	5.6	2.7	100.0

Table 108
Distribution of Persons per Vehicle - By Time of Day - Auto Weekday Trips

Time Period	Single Occupant	Two Person	Three Person	Four plus	Total: Autos
1 Owl 12am-6am	84.8	12.4	2.2	0.6	100.0
2 AM Peak 6-10am	77.7	15.6	4.5	2.2	100.0
3 Midday 10am-4pm	72.1	20.3	5.3	2.3	100.0
4 PM Peak 4-8 pm	70.4	20.1	6.3	3.2	100.0
5 Evening 8pm-12 am	63.0	24.4	8.1	4.6	100.0
Total: Weekday	72.5	19.2	5.6	2.7	100.0

4.6 Focus on Public Transit Trips

This sub-section focuses on the weekday travel in the *RT-HIS* using public transportation, any of the many specific modes of travel by transit that are available to residents of the New York City metropolitan region – including all forms of Bus (local, charter, express), Subway (including NY City, Staten Island Railroad, and PATH), Commuter Rail (LIRR, Metro North Transit, and AMTRAK), and Ferries (Staten Island, Hudson and East River services).

An in-depth profile of each transit travel is provided through series of tables comparable to those provide in the previous section (Section 4.5: Auto Vehicle Trips), and in the following sections (Section 4.7: Taxi and Group Ride; Section 4.8: Walk and Other Non-Motorized). Additionally, the aspects of transit travel that are unique and important to describing travel by commuter rail, subway, ferries and express bus are examined here. The focus for this is on “mode of access “ and “distribution mode” (or “mode egress”) for these “premium” transit modes.

4.6.1 Origin-Destination Patterns

The general origin-destination pattern of travel for all transit trips is shown in **Table 109**.

Table 109
General Origin-Destination (O/D) Patterns by County of Trip Origin -- by County Group of Trip Origin (Level 1) – Transit Weekday Trips *Row Percents*

County Group	Within County	To Adjoining County (not NYC)	To Manhattan	To Other NYC	To Other NTJPA County	To Other NYMTC County	To Other in Metro Area	Out of Metro Area
Manhattan	49.7			33.9	7.5	7.5	1.4	
Other NYC	57.8		30.0	9.1	1.6	1.1		0.3
Long Island	69.8	1.7	21.4	5.3	0.6	0.6		0.5
Mid-Hudson (NYMTC)	71.5	1.6	21.5	4.2	0.5	0.9		
Mid-Hudson (Other)	88.7	1.0	6.9	1.0	1.0	1.0		0.5
Connecticut	86.9	1.4	10.5			0.8	0.4	
Bergen-Passaic	52.7	10.0	26.0	8.2	0.4	2.5	0.4	
Essex-Hudson-Union	51.9	15.5	24.3	3.5	1.1	2.3	0.7	0.7
Middlesex-Morris-Somerset	76.7	5.7	10.3	0.4	0.8	4.6	1.3	0.2
Monmouth-Ocean	89.0	1.3	5.1	0.7	0.9	2.6	0.2	0.2
Hunterdon-Sussex-Warren	85.8	4.7	3.1	0.8		3.1	1.6	0.8
Mercer	71.4	10.2	6.1			8.2	2.0	2.0
Out of Metro Area					41.7	25.0	25.0	8.3
Total: County Group	59.8	1.6	16.2	14.9	3.2	3.4	0.6	0.2

4.6.2 Time of Day

Table 110 and Figure 19 display the diurnal distribution of weekday transit trips in the *RT-HIS*, by hour of departure. The temporal distribution of transit trips general time period is found in Table 111.

Table 110
Diurnal Distribution - Hour of Departing - Transit Weekday Trips

Hour Departing	NYC Total	Long Island	Mid-Hudson (all)	Connecticut	NJTPA	Mercer	Total
0	0.4	0.4	0.2		0.2		0.3
1	0.1				0.1		0.1
2		0.1					0.0
3	0.0						0.0
4	0.2		0.6		0.3		0.2
5	1.3	2.1	1.3	0.7	1.2	4.0	1.3
6	3.8	6.4	7.1	10.2	6.4	5.9	4.9
7	12.2	20.1	19.6	20.2	18.6	17.8	14.8
8	12.1	14.2	14.3	15.0	14.7	17.8	13.1
9	5.1	4.4	1.0	1.7	2.7	2.0	4.2
10	3.6	0.9	0.7	0.6	1.7	1.0	2.7
11	4.1	2.7	2.2	1.3	2.7	2.0	3.5
12	3.7	0.9	3.0	3.9	2.9	2.0	3.3
13	4.4	2.1	3.0	4.8	2.7	4.0	3.8
14	8.1	13.6	11.0	19.9	11.3	10.9	9.8
15	7.9	10.4	16.9	10.4	12.6	19.8	9.7
16	6.6	5.7	4.3	1.7	5.1	5.9	5.9
17	10.5	9.0	6.2	5.4	8.6	3.0	9.5
18	6.5	3.9	4.1	1.9	4.2	1.0	5.5
19	3.3	1.1	2.1	1.1	1.4	1.0	2.6
20	2.1	0.4	0.8		1.1	1.0	1.6
21	1.7	1.1	1.0	0.2	0.5	1.0	1.3
22	1.7	0.4		0.6	0.7		1.3
23	0.7	0.1	0.4	0.6	0.3		0.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 19
Diurnal Distribution - Hour of Departing - Transit Weekday Trips

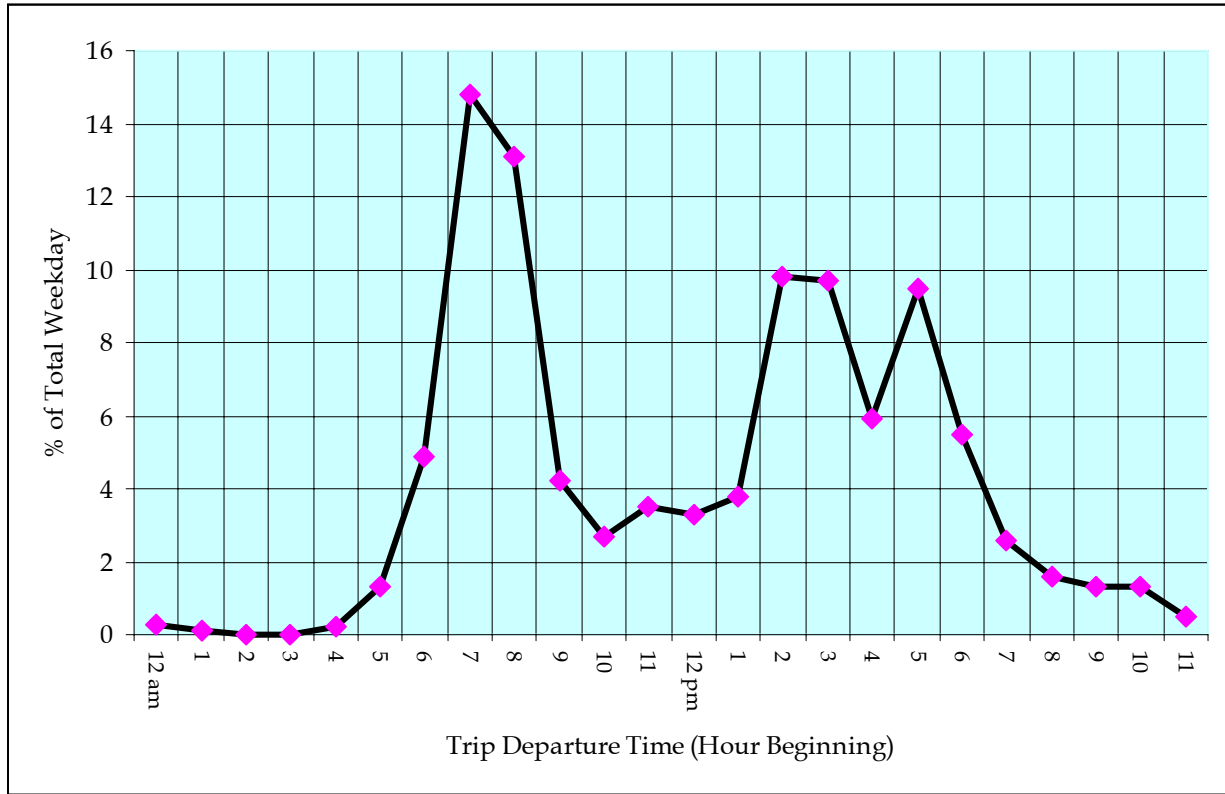


Table 111
Diurnal Distribution - Time Period - Transit Weekday Trips

Time Period	NYC Total	Long Island	Mid-Hudson (all)	Connecticut	NJTPA	Mercer	Total
Owl 12am-6am	2.0	2.6	2.0	0.7	1.8	4.0	2.0
AM Peak 6-10am	33.2	45.2	42.0	47.2	42.4	44.4	37.1
Midday 10am-4pm	31.7	30.6	37.0	40.9	34.0	39.4	32.8
PM Peak 4-8 pm	26.8	19.7	16.8	9.9	19.3	10.1	23.4
Evening 8pm-12 am	6.2	1.9	2.2	1.3	2.5	2.0	4.7
Total: Weekday	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 112 shows the distribution of weekday trips by specific mode of travel for the two peak periods of travel and for all other off-peak times.

Table 112
Mode of Travel by Time Period

Main Mode of Travel	Travel Period			Total
	AM Peak 6-10am	PM Peak 4-8 pm	Other Off-Peak	
Commuter Rail	42.8	37.4	19.8	100.0
Ferry	40.6	34.0	25.5	100.0
PATH	39.7	38.2	22.1	100.0
Express Bus	41.8	34.7	23.5	100.0
Subway (NY)	33.1	31.1	35.8	100.0
LRT (Newark)	33.3	20.0	46.7	100.0
Charter Bus	43.6	28.2	28.2	100.0
School Bus	49.0	3.9	47.1	100.0
Local Bus	29.1	21.3	49.6	100.0
Total: All Modes	37.1	23.4	39.5	100.0

4.6.3 Purpose of Travel - Transit Trips

The distribution of trip purposes for transit trips is presented in **Table 113**. The pattern of specific mode use by trip purpose is presented in **Table 114** and **Table 115**.

Table 113
Trip Purpose- By County Group of Trip Origin - Transit Weekday Trips

Trip Purpose	NYC Total	Long Island	Mid-Hudson (all)	Connecticut	NJTPA	Mercer	Out of Area	Total
Home to Work	16.9	17.0	15.0	9.0	17.5	10.2		16.5
Home to School	8.4	32.4	29.9	34.1	25.9	31.6		15.1
Home to Social Recreation	5.1	1.8	1.8	1.4	2.6	2.0		4.1
Home to Personal Business	5.1	1.1	1.7	2.2	1.9	1.0		4.0
Home to Shop	1.6	0.2	0.6	1.2	0.9	2.0		1.3
Home to Serve Pass	0.7	0.2	0.4	0.4	0.3			0.6
Home to Other Purpose	0.7	0.1	0.3		0.6			0.6
Work to Home	18.7	2.1	3.3	4.8	8.4	7.1	8.3	14.5
School to Home	8.0	27.4	28.6	29.5	23.9	27.6	25.0	13.9
Social Recreation to Home	6.1	1.1	0.9	1.2	1.6	1.0	8.3	4.6
Personal Business to Home	4.0	1.9	0.6	0.6	1.8	1.0	8.3	3.2
Shop to Home	2.2	0.3	0.6	1.2	0.9	4.1		1.7
Serve Pass to Home	0.5	0.2	0.6	0.4	0.2			0.5
Other Purpose to Home	1.0				0.0			0.7
At Work-Work Related	2.8	0.6	0.1		1.0			2.1
At Work-Other	8.7	5.2	5.4	1.2	3.9	2.0		7.2
Other (non-Home or Work)	9.3	8.3	10.1	12.7	8.6	10.2	50.0	9.4
Total: All Purposes	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 114
Mode of Travel by Work and Non-Work Trip Type

Main Mode of Travel	Work or Non-Work		
	Work Trip	Non-Work	Total
Commuter Rail	17.5	3.0	8.8
Ferry	1.3	0.4	0.8
PATH	3.5	1.0	2.0
Express Bus	5.9	1.0	2.9
Subway (NY)	55.5	28.1	39.0
LRT (Newark)	0.1	0.1	0.1
Charter Bus	0.0	0.5	0.3
School Bus	0.4	37.2	22.6
Local Bus	15.7	28.8	23.6
Total	100.0	100.0	100.0

Table 115
Mode of Travel by Home-and Non-Home Based Trip Type

Main Mode of Travel	Trip Purpose - Two-Way Based					Total
	Home-Based Work	Home-Based School	Home-Based Other	Work-Based	Non-Home or Work-Based	
Commuter Rail	19.0	1.4	4.5	12.1	4.3	8.8
Ferry	1.5	0.3	0.6	0.8	0.6	0.8
PATH	3.4	0.6	1.3	3.2	1.7	1.9
Express Bus	6.7	0.2	1.9	3.2	0.9	2.9
Subway (NY)	52.9	14.1	43.0	61.5	38.3	38.9
LRT (Newark)	0.1	0.1	0.1		0.3	0.1
Charter Bus	0.0	0.1	0.2	0.2	2.1	0.3
School Bus	0.4	67.6	2.1	2.4	23.8	22.6
Local Bus	16.1	15.7	46.2	16.6	28.1	23.6
Total	100.0	100.0	100.0	100.0	100.0	100.0

4.6.4 Trip Length

In **Table 116** the average reported travel times, trip distance and estimated speed for all trips made by transit is displayed, broken down by County Group of trip origin. The average transit trip in is 8.6 miles long, and takes 49 minutes to complete at an average travel speed of 10.2 miles per hour. This is for the entire trip – from origin to destination place – including all means of travel used to complete the trip.

Transit trips in New York City are much shorter than from other parts of the region, but slower, taking longer than the average transit trip from all places except Long Island.

Table 116
Travel Time, Distance and Estimated Speed- By County Group of Trip Origin - Transit Weekday Trips

County Group of Trip Origin	Reported Travel Time	Trip Distance	Avg. System Speed
Manhattan	52.5	9.2	10.4
Other NYC	52.0	6.4	7.2
Long Island	47.3	11.6	14.4
Mid-Hudson (NYMTC)	40.1	10.6	15.0
Mid-Hudson (Other)	38.1	11.7	17.9
Connecticut	35.8	10.3	15.9
Bergen-Passaic	52.3	10.5	10.9
Essex-Hudson-Union	48.6	8.1	9.8
Middlesex-Morris-Somerset	38.2	11.6	14.5
Monmouth-Ocean	34.6	11.8	16.2
Hunterdon-Sussex-Warren	30.7	13.6	19.3
Mercer	42.1	15.8	18.1
Out of Metro Area	60.2	39.4	10.9
Total	49.0	8.6	10.2

Table 117 shows that the average Commuter Rail trip is the longest of any type of transit trip (28.2 miles), but the fastest at an average speed of 19 mph, taking on average are not quite one and a half hours (88 minutes) from door-to-door. Trips using Express Bus trips are also longer (19.8 miles), and require more than an hour to complete (77 minutes). Trips that are primarily Subway trips are a little less than twice as long (7.4 miles) as local bus trips (4.2 miles), but are about 40% faster (8.2 mph vs. 5.9 mph).

Table 117
Travel Time, Distance and Estimated Speed - By Transit Mode - Transit Weekday Trips

Main Mode - Hierarchy Based	Reported Travel Time	Trip Distance	Avg. System Speed
Commuter Rail	88.0	28.2	18.8
Ferry	101.6	16.2	9.1
Subway & Other Rail	53.7	7.4	8.2
Express Bus	76.7	19.8	15.3
Local Bus	42.3	4.2	5.9
School Bus	27.3	6.1	11.8
Total	49.0	8.6	10.2

Table 118
Trip Distance (Ranges) - By County Group of Trip Origin - Transit Weekday Trips

Trip Distance (Miles)	NYC Total	Long Island	Mid-Hudson (all)	Connecticut	NJTPA	Mercer	Out of Area	Total
< .5 Mile	1.2	6.7	2.6	1.3	4.9	5.1		2.2
.5-1 Mile	4.4	9.2	6.2	9.8	8.0	3.8	25.0	5.5
1-3 Miles	26.8	36.7	32.2	38.6	33.1	41.0		29.1
3-5 Miles	17.3	2.7	9.6	17.1	6.0	1.3		14.2
5-10 Miles	27.2	10.7	18.7	15.8	17.3	12.8		23.7
10-15 Miles	12.1	2.9	7.3		9.9	10.3		10.4
15-20 Miles	4.9	6.6	5.8	1.5	5.3	2.6		5.0
20-30 Miles	2.6	11.0	8.2	3.3	7.2	2.6		4.2
30-40 Miles	2.0	8.0	4.7	4.8	3.4			2.8
40-60 Miles	1.2	4.0	2.7	5.4	3.4	15.4	75.0	2.0
60 + Miles	0.3	1.5	2.2	2.4	1.6	5.1		0.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 119
Trip Distance (Ranges) - By Transit Mode - Transit Weekday Trips

Trip Distance (Miles)	Commuter Rail	Ferry	PATH	Express Bus	Subway (NY)	LRT (Newark)	Charter Bus	School Bus	Local Bus	Total
< .5 Mile	1.7	1.0	0.4	0.5	0.8		6.3	5.4	2.2	2.2
.5-1 Mile			0.8	2.6	1.2	12.5	18.8	13.5	8.7	5.5
1-3 Miles	1.4	9.0	8.5	1.5	19.5	62.5	12.5	48.0	44.7	29.1
3-5 Miles	1.1	8.0	9.6	5.7	17.7	6.3		6.5	21.4	14.2
5-10 Miles	5.1	10.0	45.0	12.4	38.9	6.3	12.5	13.1	14.7	23.7
10-15 Miles	6.9	17.0	20.8	28.1	16.2			5.1	3.6	10.4
15-20 Miles	12.8	32.0	6.5	17.5	3.9	12.5	12.5	2.6	3.3	5.0
20-30 Miles	28.9	14.0	3.8	10.1	1.0		6.3	2.4	0.9	4.2
30-40 Miles	24.7	5.0	1.5	10.6	0.1		18.8	0.9	0.1	2.8
40-60 Miles	14.3	2.0	3.1	9.5	0.4		6.3	1.0	0.2	2.0
60 + Miles	2.9	2.0		1.5	0.2		6.3	1.6	0.1	0.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 120
Trip Travel Time (Ranges) - By County Group of Trip Origin - Transit Weekday Trips

Trip Distance (Miles)	NYC Total	Long Island	Mid-Hudson (all)	Connecticut	NJTPA	Mercer	Out of Area	Total
< 5 Minutes	1.2	3.6	2.2	0.4	2.5	3.1		1.6
5-10 Mins.	1.9	4.9	8.7	10.3	6.6	7.1	16.7	3.5
10-20 Mins.	10.8	30.2	21.3	25.8	24.9	29.6	8.3	15.6
20-30 Mins.	19.5	21.3	25.4	26.2	22.9	24.5		20.7
30-40 Mins.	9.6	4.5	8.8	12.1	8.3	5.1	25.0	9.1
40-50 Mins.	13.3	3.2	7.7	7.3	7.6	5.1	16.7	11.1
50-60 Mins.	18.6	4.8	6.9	5.2	8.0	4.1		14.7
60-90 Mins.	17.4	16.0	12.3	7.7	12.5	8.2	16.7	15.9
90 + Mins.	7.8	11.5	6.7	5.0	6.8	13.3	16.7	7.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 121
Trip Travel Time (Ranges) - By Transit Mode - Transit Weekday Trips

Trip Time (Minutes)	Commuter Rail	Ferry	PATH	Express Bus	Subway (NY)	LRT (Newark)	Charter Bus	School Bus	Local Bus	Total
< 5 Minutes	1.1	1.9	0.8	1.8	1.0			3.1	1.5	1.6
5-10 Mins.	1.4	0.9	1.5	0.8	1.5	6.7		9.2	2.8	3.5
10-20 Mins.	2.7	2.8	4.2	1.5	7.9	13.3	2.6	36.0	16.7	15.6
20-30 Mins.	1.5	2.8	18.0	2.8	17.7	40.0	10.5	30.1	27.0	20.7
30-40 Mins.	2.5	0.9	7.7	5.6	9.6		2.6	9.7	11.1	9.1
40-50 Mins.	4.3	6.5	16.9	6.1	14.7	6.7	7.9	5.7	13.4	11.1
50-60 Mins.	11.5	12.0	14.2	22.3	23.1	6.7	7.9	3.0	12.6	14.7
60-90 Mins.	42.5	39.8	25.3	36.3	18.4	6.7	7.9	2.4	10.7	15.9
90 + Mins.	32.5	32.4	11.5	22.8	6.2	20.0	60.5	0.8	4.3	7.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

4.6.5 Hours Spent in Travel

The *RT-HIS* data permits an analysis and summary of the total amount of time spent in transportation by residents of the region on a typical weekday. For transit this is represented as total person hours of travel (PHT) by public transportation modes.

The distribution of transit person hours of travel by County Group of trip origin, and by Work / non-Work and by Peak / Off-Peak is found in **Table 122** and **Table 123**.

Table 122
Distribution of Person Hours of Travel (PHT)- Work / Non-Work
By County Group of Trip Origin - Transit Weekday Trips

County Group of Trip Origin	Work Trip	Non-Work	Total
Manhattan	20.4	13.2	33.6
Other NYC	16.3	22.1	38.4
Long Island	3.2	3.5	6.7
Mid-Hudson (NYMTC)	1.6	1.9	3.5
Mid-Hudson (Other)	0.2	0.9	1.2
Connecticut	0.9	1.8	2.7
Bergen-Passaic	1.5	0.7	2.2
Essex-Hudson-Union	3.1	2.1	5.2
Middlesex-Morris-Somerset	0.9	1.8	2.8
Monmouth-Ocean	0.5	1.9	2.4
Hunterdon-Sussex-Warren	0.1	0.5	0.6
Mercer	0.3	0.4	0.6
Out of Metro Area	0.0	0.1	0.1
Total	48.9	51.1	100.0

Table 123
Distribution of Person Hours of Travel (PHT)- Peak / Off-Peak
By County Group of Trip Origin - Transit Weekday Trips

County Group of Trip Origin	AM Peak 6-10am	PM Peak 4-8 pm	Other Off-Peak	Total
1 Manhattan	4.9	17.7	11.0	33.6
2 Other NYC	16.3	6.3	15.8	38.4
3 Long Island	4.0	0.7	2.0	6.7
4 Mid-Hudson (NYMTC)	1.8	0.5	1.2	3.5
5 Mid-Hudson (Other)	0.5	0.0	0.6	1.2
6 Connecticut	1.4	0.2	1.0	2.7
7 Bergen-Passaic	1.2	0.5	0.5	2.2
8 Hudson-Essex	2.4	1.2	1.6	5.2
9 Union, Som., Morris	1.6	0.1	1.0	2.8
10 MOM	1.1	0.1	1.2	2.4
11 Western	0.3	0.0	0.3	0.6
12 Mercer	0.2	0.1	0.3	0.6
13 Out of Metro Area	0.0	0.1	0.0	0.1
Total	35.9	27.7	36.5	100.0

4.6.6 Access and Egress from Transit

The focus in this sub-section of the report is on “mode of access “ and “distribution mode” (or “mode egress”) for the “premium” transit modes. For this report, these include:

- ❑ commuter rail
- ❑ ferries, and
- ❑ express bus

Subway as a fixed route, rapid transit system, is classified as a “premium” transit system for the Best Practice Model (BPM). For this reporting focused on modes of access, however, it is excluded to simplify the reporting since it is so frequently used as part of a commuter rail, ferry or express bus trip, either for access or distribution from these other premium modes.

Table 124 shows for each county of origin, the mode of access for premium transit trips. Walk is the means of access for half (48.9%) of these transit trips, with Drive (and Park) not quite one-third (32.2%) and Auto Passenger (drop-off) about 8%, and connecting local bus about 11%. There is considerable variation among the counties of the region with respect to access mode shown in this table.

Table 124
Mode of Access to Premium (w/o Subway) Transit Modes - by County of Origin

Origin County	Access Mode				
	Drive	Auto Pass	Local Bus	Walk (or Other)	Total
Manhattan	35.2	5.5	8.0	51.3	100.0
Queens	12.7	1.4	23.9	62.0	100.0
Bronx			15.8	84.2	100.0
Brooklyn	9.5	9.5	9.5	71.4	100.0
Staten Island	19.7	8.2	26.2	45.9	100.0
Nassau	31.4	13.4	11.0	44.2	100.0
Suffolk	69.6	17.4	4.3	8.7	100.0
Westchester	23.3	19.0	4.3	53.4	100.0
Rockland	50.0		30.0	20.0	100.0
Putnam	60.0			40.0	100.0
Orange	55.6	11.1	11.1	22.2	100.0
Dutchess	33.3		33.3	33.3	100.0
Fairfield	71.6	4.5	1.5	22.4	100.0
Bergen	13.5	6.7	14.6	65.2	100.0
Passaic	46.7		6.7	46.7	100.0
Hudson	17.6	3.9	17.6	60.8	100.0
Essex	22.4	4.1	10.2	63.3	100.0
Union	20.0	10.0	8.0	62.0	100.0
Morris	50.0	35.0	5.0	10.0	100.0
Somerset	66.7			33.3	100.0
Middlesex	36.0	16.0	16.0	32.0	100.0
Monmouth	45.8	8.3	12.5	33.3	100.0
Ocean	50.0			50.0	100.0
Hunterdon	100.0				100.0
Sussex				100.0	100.0
New Haven			100.0		100.0
Mercer	35.7		28.6	35.7	100.0
Out of Metro Area		25.0	50.0	25.0	100.0
Total	32.2	8.3	10.6	48.9	100.0

In **Table 125** the access mode shares are shown at the County Group level, again by origin of the premium transit trip.

Table 125
Mode of Access to Premium (w/o Subway) Transit Modes - by County Group of Trip Origin

Origin County Group	Access Mode				Total
	Drive	Auto Pass	Local Bus	Walk (or Other)	
NYC Total	29.3	5.3	11.1	54.3	100.0
Long Island	42.5	14.2	9.2	34.2	100.0
Mid-Hudson (all)	28.1	16.4	7.5	47.9	100.0
Connecticut	72.1	4.4	1.5	22.1	100.0
NJTPA	26.5	9.1	11.9	52.5	100.0
Mercer	35.7		28.6	35.7	100.0
Out of Metro Area		25.0	50.0	25.0	100.0
Total	32.2	8.3	10.5	49.0	100.0

To complete a commuter rail, ferry or express bus trip, a “distribution” or “egress” mode is used to travel to the final destination for the trip. In **Table 126** and **Table 127** it is seen that somewhat more than half (55%) of these premium transit trips are completed by walking. Subway is used as the distribution for about 30% of these trips; and PATH for 7.7%. Ferries provide a distribution function for 7.3% of these trips as well.

Table 126
Distribution Mode for Premium (w/o Subway) Transit Modes - by County of Destination

Destination County	Distribution Mode				
	Ferry	PATH	Subway	Walk (or Other)	Total
Manhattan	8.6	7.1	33.1	51.2	100.0
Queens	1.4		25.0	73.6	100.0
Bronx	5.4		29.7	64.9	100.0
Brooklyn	9.5		50.0	40.5	100.0
Staten Island	60.7		4.9	34.4	100.0
Nassau			53.8	46.2	100.0
Suffolk	11.6		46.4	42.0	100.0
Westchester			26.7	73.3	100.0
Rockland	9.1	27.3	9.1	54.5	100.0
Putnam			20.0	80.0	100.0
Orange	11.1	33.3	11.1	44.4	100.0
Dutchess		16.7	50.0	33.3	100.0
Fairfield			19.4	80.6	100.0
Bergen	2.3	19.3	31.8	46.6	100.0
Passaic		21.4	21.4	57.1	100.0
Hudson	15.7	19.6	17.6	47.1	100.0
Essex		31.3	6.3	62.5	100.0
Union	4.0	10.0	6.0	80.0	100.0
Morris	5.0	30.0	10.0	55.0	100.0
Somerset		14.3	28.6	57.1	100.0
Middlesex		26.0	12.0	62.0	100.0
Monmouth	4.0	20.0	12.0	64.0	100.0
Ocean				100.0	100.0
Hunterdon				100.0	100.0
Sussex				100.0	100.0
New Haven			100.0		100.0
Mercer		21.4	7.1	71.4	100.0
Out of Metro Area			25.0	75.0	100.0
Total	7.3	7.7	29.8	55.2	100.0

Table 127
Distribution Mode for Premium (w/o Subway) Transit Modes - by County Group of Trip Origin of Destination

Destination County Group	Distribution Mode				Total
	Ferry	PATH	Subway	Walk (or Other)	
NYC Total	11.5	5.3	31.1	52.1	100.0
Long Island	3.3		51.9	44.8	100.0
Mid-Hudson (all)	0.7	4.8	25.3	69.2	100.0
Connecticut			20.6	79.4	100.0
NJTPA	4.2	20.8	16.6	58.4	100.0
Mercer		21.4	7.1	71.4	100.0
Out of Metro Area			25.0	75.0	100.0
Total: Metro Area	7.2	7.7	29.8	55.2	100.0

4.7 Focus on Other Vehicle Trips: Group Rides

This sub-section focuses on the weekday travel in the *RT-HIS* that is made by Taxi or other group ride means of traveling the New York City metropolitan region – including:

- ❑ Yellow Taxi / Medallion Cab
- ❑ Gypsy Cab
- ❑ Car Service / “Black Car”
- ❑ For Hire Vans
- ❑ Contract Bus
- ❑ Inter-City Travel

4.7.1 Origin-Destination Patterns

The general origin-destination pattern of travel for this category of Taxi and other group ride travel is shown in **Table 128**.

Table 128
General Origin-Destination (O/D) Patterns by County of Trip Origin -- by County Group of Trip Origin (Level 1) – Group Ride Weekday Trips *Row Percents*

County Group	Within County	To Adjoining County (not NYC)	To Manhattan	To Other NYC	To Other NJTPA County	To Other NYMTC County	To Other in Metro Area	Out of Metro Area
Manhattan	79.1			14.4	1.5	2.7	0.8	1.5
Other NYC	75.1		14.1	3.1	0.8	0.8	1.1	4.8
Long Island	70.0	5.0	6.7	11.7		3.3		3.3
Mid-Hudson (NYMTC)	73.7	5.3	2.6	13.2				5.3
Mid-Hudson (Other)	70.6	17.6	5.9					5.9
Connecticut	81.5		11.1					7.4
Bergen-Passaic	50.0	11.1	16.7	11.1	11.1			
Essex-Hudson-Union	46.6	19.0	12.1	5.2	3.4	5.2		8.6
Middlesex-Morris-Somerset	88.5		7.7			3.8		
Monmouth-Ocean	88.9					7.4	3.7	
Hunterdon-Sussex-Warren	66.7			33.3				
Mercer	33.3		50.0			16.7		
Out of Metro Area			19.1	46.8	2.1	19.1	4.3	8.5
Total: County Group	72.7	1.6	6.5	10.7	1.3	2.9	0.9	3.3

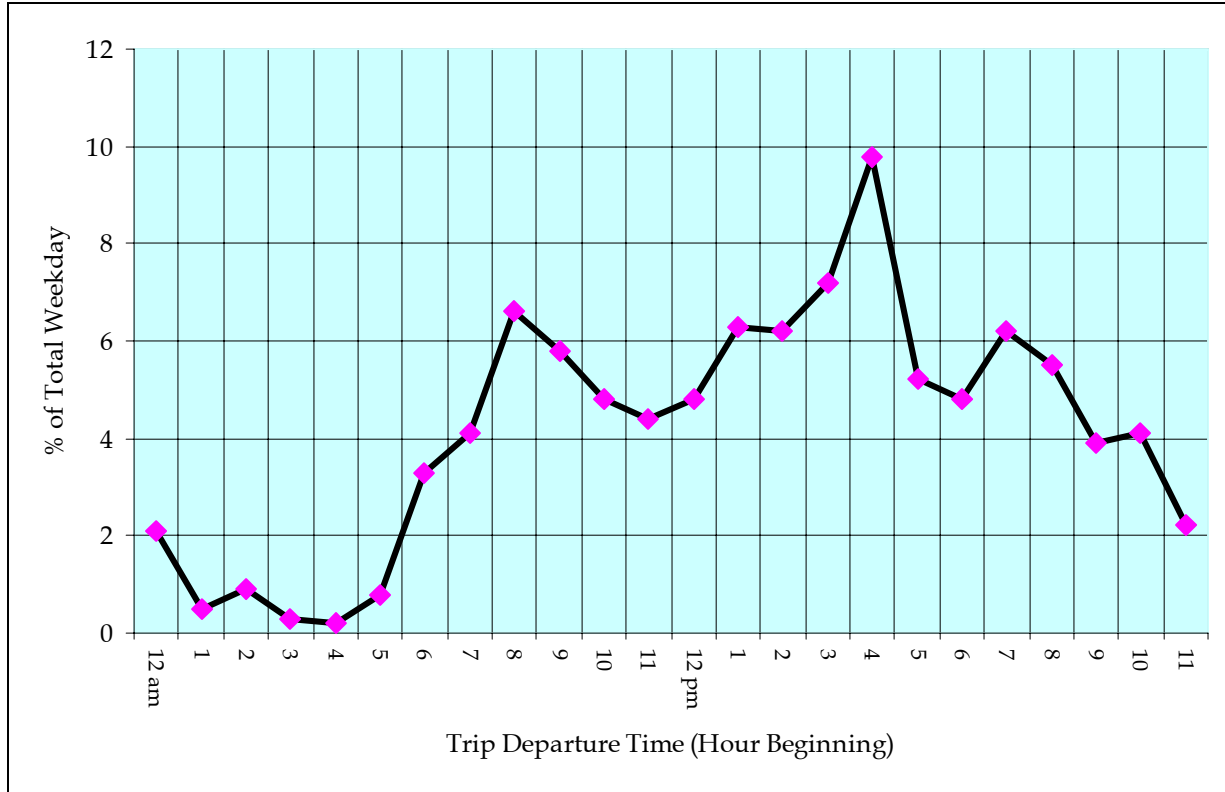
4.7.2 Time of Day

Table 129 and **Figure 20** display the diurnal distribution of weekday group ride trips in the *RT-HIS*, by hour of departure.

Table 129
Diurnal Distribution - Hour Departing - Group Ride Weekday Trips

Hour Departing	NYC
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Figure 20
Diurnal Distribution - Hour of Departing - Taxi and Shared Ride Weekday Trips



The general time period profile of Taxi and shared ride travel is shown in **Table 130**.

Table 130
Diurnal Distribution - Time Period - Group Ride Weekday Trips

Time Period	NYC Total	Long Island	Mid-Hudson (all)	Connecticut	NJTPA	Mercer	Total
Owl 12am-6am	5.4	4.3	2.3	9.8	1.9		4.8
AM Peak 6-10am	17.9	19.6	30.7	12.2	25.9	42.9	19.8
Midday 10am-4pm	29.3	53.3	46.6	46.3	36.1	28.6	33.6
PM Peak 4-8 pm	28.2	18.5	10.2	17.1	31.0	28.6	26.3
Evening 8pm-12 am	19.2	4.3	10.2	14.6	5.1		15.5
Total: Weekday	100.0	100.0	100.0	100.0	100.0	100.0	100.0

4.7.3 Purpose

The distribution of trip purposes for Taxi and group ride trips is presented in **Table 131**.

Table 131
Trip Purpose- By County Group of Trip Origin - Group Ride Weekday Trips

Trip Purpose	NYC Total	Long Island	Mid-Hudson (all)	Connecticut	NJTPA	Mercer	Total
Home to Work	9.5	13.3	9.2	4.9	11.4	25.0*	9.9
Home to School	1.0	1.1					0.8
Home to Social Recreation	6.2	5.6	4.6	14.6	7.6		6.4
Home to Personal Business	9.3	11.1	3.4	7.3	5.7		8.5
Home to Shop	1.0	1.1			7.6		1.7
Home to Serve Pass	0.9		1.1		1.9		0.9
Home to Other Purpose	2.1	1.1	3.4		0.6		1.9
Work to Home	12.3	11.1	9.2	4.9	13.9	25.0*	12.0
School to Home	0.8	1.1	2.3		0.6		0.9
Social Recreation to Home	13.1	6.7	5.7	14.6	6.3		11.3
Personal Business to Home	6.2	4.4	13.8	7.3	3.8		6.3
Shop to Home	2.5	1.1	1.1		8.2		2.9
Serve Pass to Home	3.0				1.9		2.4
Other Purpose to Home	2.6	1.1	2.3				2.0
At Work-Work Related	3.5		4.6		6.3		3.5
At Work-Other	9.5	20.0	20.7	19.5	8.2	25.0*	11.2
Other (non-Home or Work)	16.7	21.1	18.4	26.8	15.8	25.0*	17.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

4.7.4 Trip Length

Table 132 shows that the average Yellow-Medallion Taxi trip is 4.4 miles long, and takes about 21 minutes, at an average speed of about 13 mph. “Black Car” services and Gypsy Cab accommodate somewhat longer trips on average – 6.2 miles and 8.0 miles respectively. The average trip by Airport Service is about 27 miles, and takes one hour and six minutes door-to-door.

Table 132
Travel Time, Distance and Estimated Speed- By Sub-Mode - Group Ride Weekday Trips

Main Mode - Hierarchy Based	Reported Travel Time	Trip Distance	Avg. System Speed
Intercity	60.3	45.5	46.3
Airport Service	65.8	27.0	24.6
Contract Bus	61.2	22.2	22.4
Shuttle-Commute Van	37.0	6.5	10.5
Yellow-Medallion Taxi	20.6	4.4	12.9
For Hire Van-Jitney	44.8	11.0	14.7
Car Service-Black	30.5	6.2	12.2
Gypsy Cab	37.6	8.0	12.8
Other	37.6	6.4	10.2
Total	27.5	6.6	14.5

* Note: Statistics exclude trips with reported travel times greater than 4 hours.

Reflecting the importance of taxi trips in New York City, the average group ride trip for trips there is similar to that of the regional taxi average – 4.6 miles – as shown **Table 133**.

Table 133
Travel Time, Distance and Estimated Speed- By County Group of Trip Origin -
Group Ride Weekday Trips

County Group of Trip Origin	Reported Travel Time	Trip Distance	Avg. System Speed
NYC Total	25.4	4.6	10.8
Long Island	30.0	20.6	42.2
Mid-Hudson (all)	26.3	9.7	22.3
Connecticut	20.3	11.9	35.1
NJTPA	42.7	12.5	17.6
Mercer	54.2	34.6	38.3
Total	27.5	6.6	14.5

* Note: Statistics exclude trips with reported travel times greater than 4 hours.

In **Table 134**, distribution of group ride trips by trip distance range interval is shown. The largest share is for trips in the 1-3 mile range – about one-half of all regional group ride trips, including New York City and the Mid-Hudson counties. For the NTJPS counties, there is a high share of trips in the 5-10 mile range (21.2%). Group ride trips from Long Island tend to be the longest, with nearly one-quarter (24.1%) over 40 miles long.

Table 134
Trip Distance (Ranges) – By County Group of Trip Origin - Group Ride Weekday Trips

Trip Distance (Miles)	NYC Total	Long Island	Mid-Hudson (all)	Connecticut	NJTPA	Mercer	Total
< .5 Mile	6.8		5.5		3.6	25.0*	5.8
.5-1 Mile	10.5	6.3	6.8		8.0		9.4
1-3 Miles	47.5	36.7	45.2	67.9*	23.4		44.1
3-5 Miles	14.9	5.1	13.7		9.5		13.2
5-10 Miles	11.4	10.1	9.6		21.2	25.0*	12.1
10-15 Miles	6.7	6.3	5.5		8.0		6.5
15-20 Miles	0.8	3.8			5.1		1.4
20-30 Miles	0.7	3.8	4.1		9.5		2.1
30-40 Miles	0.1	3.8	6.8	14.3*	6.6		1.9
40-60 Miles	0.5	12.7	2.7		5.1	50.0*	2.1
60 + Miles	0.1	11.4		17.9			1.3
Total	100.0	100.0	100.0	100.0*	100.0	100.0	100.0

** Too few cases in sample to support a useful estimate.

Table 135 shows the trip length distribution by specific group ride mode.

Table 135
Trip Distance (Ranges) - By Sub-Mode - Group Ride Weekday Trips

Trip Distance (Miles)	Inter-city	Airport Service	Contract Bus	Shuttle- Commute Van	Yellow- Medallion Taxi	For Hire Van-Jitney	Car Service- Black	Gypsy Cab	Other	Total: Group Ride
< .5 Mile			2.4	2.0	6.5		3.0		10.9	5.9
.5-1 Mile				8.0	9.1	8.7	9.0	5.7	19.4	9.4
1-3 Miles		13.3	9.5	10.0	56.3	8.7	38.8	30.2	19.4	44.2
3-5 Miles	11.8		4.8	64.0	11.7	4.3	16.4	15.1	5.4	13.1
5-10 Miles		6.7	21.4	2.0	10.6	56.5	11.9		21.7	12.1
10-15 Miles	5.9		14.3	2.0	2.3	8.7	9.0	49.1	14.0	6.6
15-20 Miles		33.3	9.5	2.0	0.4		1.5		1.6	1.4
20-30 Miles				6.0	1.0	4.3	10.4		4.7	2.1
30-40 Miles	5.9	33.3	16.7	4.0	0.4				2.3	1.8
40-60 Miles	64.7	13.3	16.7		0.3	8.7			0.8	2.1
60 + Miles	11.8		4.8		1.4					1.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

4.7.5 Person Hours of Travel

With the *RT-HIS* data the total amount of time spent in travel by group ride modes for residents of the region on a typical weekday can be estimated. For these trips, this is represented as total person hours of travel (PHT) by group ride modes.

The distribution of group ride person hours of travel by County Group of trip origin, and by trip travel time interval is found in **Table 136**

Table 136
Distribution of Person Hours of Travel (PHT) - By Trip Travel Time -
By County Group of Trip Origin - Group Ride Weekday Trips

Trip Time (Minutes)	NYC Total	Long Island	Mid- Hudson (all)	Connect- icut	NJTPA	Mercer	Out of Area	Total
< 5 Minutes	3.9	20.3	7.0		9.6			5.1
5-10 Mins.	19.3	5.1	26.3	22.2	3.7	16.7*	6.7	16.9
10-20 Mins.	37.9	25.4	19.3	55.6	27.4	33.3*		34.4
20-30 Mins.	19.9	16.9	21.1		11.9		2.2	17.9
30-40 Mins.	2.6	5.1	3.5		11.9		2.2	3.7
40-50 Mins.	3.4	5.1		7.4	8.9		2.2	3.9
50-60 Mins.	6.5	8.5	3.5	7.4	11.1		6.7	6.9
60-90 Mins.	2.0	6.8	7.0		5.9	33.3*	4.4	3.0
90 + Mins.	4.5	6.8	12.3	7.4	9.6	16.7*	75.6	8.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

* Too few cases in sample to support a useful estimate.

4.8 Focus on Walk and Other Non-Motorized Trips

This last sub-section provides a focus on the weekday travel in the *RT-HIS* that is served by waling (only) or by other non-Motorized means of travel in the New York City metropolitan region – including:

- ❑ Walking (only)
- ❑ Bicycle
- ❑ Skates
- ❑ Wheelchair

4.8.1 Origin-Destination Patterns

Table 137 shows that virtually all (97.3%) of these non-Motorized trips are made within a single county.

Table 137
General Origin-Destination (O/D) Patterns by County of Trip Origin -- by County Group of Trip Origin (Level 1) – Non-Motorized Weekday Trips *Row Percents*

County Group	Within County	To Adjoining County (not NYC)	To Manhattan	To Other NYC	To Other in Metro Area	To Other NJTPA County	To Other NYMTC County	Out of Metro Area
Manhattan	98.2			0.9	0.3	0.5	0.1	0.0
Other NYC	98.4		0.8	0.3	0.2	0.3		0.1
Long Island	97.1	0.8	1.0	0.8		0.4		
Mid-Hudson (NYMTC)	95.0	2.5	0.6	0.6	0.2	1.0		
Mid-Hudson (Other)	94.9	0.7		0.7		3.6		
Connecticut	99.2		0.8					
Bergen-Passaic	94.9	1.8	1.4	0.2	0.4	1.0	0.2	
Essex-Hudson-Union	95.0	2.5	0.7		0.6	0.7	0.4	
Middlesex-Morris-Somerset	88.3	4.0	2.0	3.4	0.6	1.4	0.3	
Monmouth-Ocean	97.2	1.2		0.6	0.3	0.6		
Hunterdon-Sussex-Warren	93.6	3.8	1.3			1.3		
Mercer	96.3	1.9				1.9		
Out of Metro Area				21.4		7.1		71.4
Total: County Group	97.3	0.6	0.5	0.6	0.3	0.5	0.1	0.1

4.8.2 Time of Day

The time of day of travel for walk and other non-motorized trips, by hour of departure is shown in **Table 138** and in **Figure 21**. As shown in **Table 139**, outside New York City, the majority of these trips are made in the mid-day period, while in the City

Table 138
Diurnal Distribution - Hour Departing - Non-Motorized Weekday Trips

Hour Departing	NYC Total	Long Island	Mid-Hudson (all)	Connecticut	NJTPA	Mercer	Total
0	0.5	0.3			0.2		0.4
1	0.2	0.4			0.0		0.1
2	0.1	0.4			0.1		0.1
3	0.0				0.1		0.0
4	0.0				0.2		0.0
5	0.1		0.4		0.2		0.1
6	0.7	0.8	1.0	0.5	1.2	2.0	0.8
7	3.9	6.9	5.5	7.4	5.7	8.9	4.6
8	11.3	7.7	12.4	11.0	13.5	10.9	11.5
9	4.3	4.2	3.0	1.9	3.1	5.0	3.9
10	4.2	1.7	3.7	3.8	5.5	4.0	4.2
11	4.9	7.5	6.8	6.2	5.3	5.9	5.3
12	7.3	9.7	9.9	5.0	8.8	6.9	7.8
13	7.5	12.8	9.4	6.5	6.8	10.9	7.8
14	9.5	11.2	9.6	14.4	12.7	6.9	10.3
15	10.2	12.7	11.8	12.5	10.9	14.9	10.7
16	6.6	6.3	4.4	5.8	6.6	4.0	6.4
17	7.2	5.0	6.2	8.9	6.1	8.9	6.8
18	7.0	5.0	6.6	6.0	4.3	3.0	6.3
19	5.2	2.8	5.1	5.0	3.3	5.0	4.7
20	3.7	1.5	2.5	1.7	2.6	1.0	3.2
21	2.9	2.0	1.1	1.9	1.6	2.0	2.5
22	2.1	0.5	0.4	0.7	0.9		1.6
23	0.8	0.4	0.3	0.7	0.4		0.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Figure 21
Diurnal Distribution - Hour of Departing - Walk and Other Non-Motorized Weekday Trips

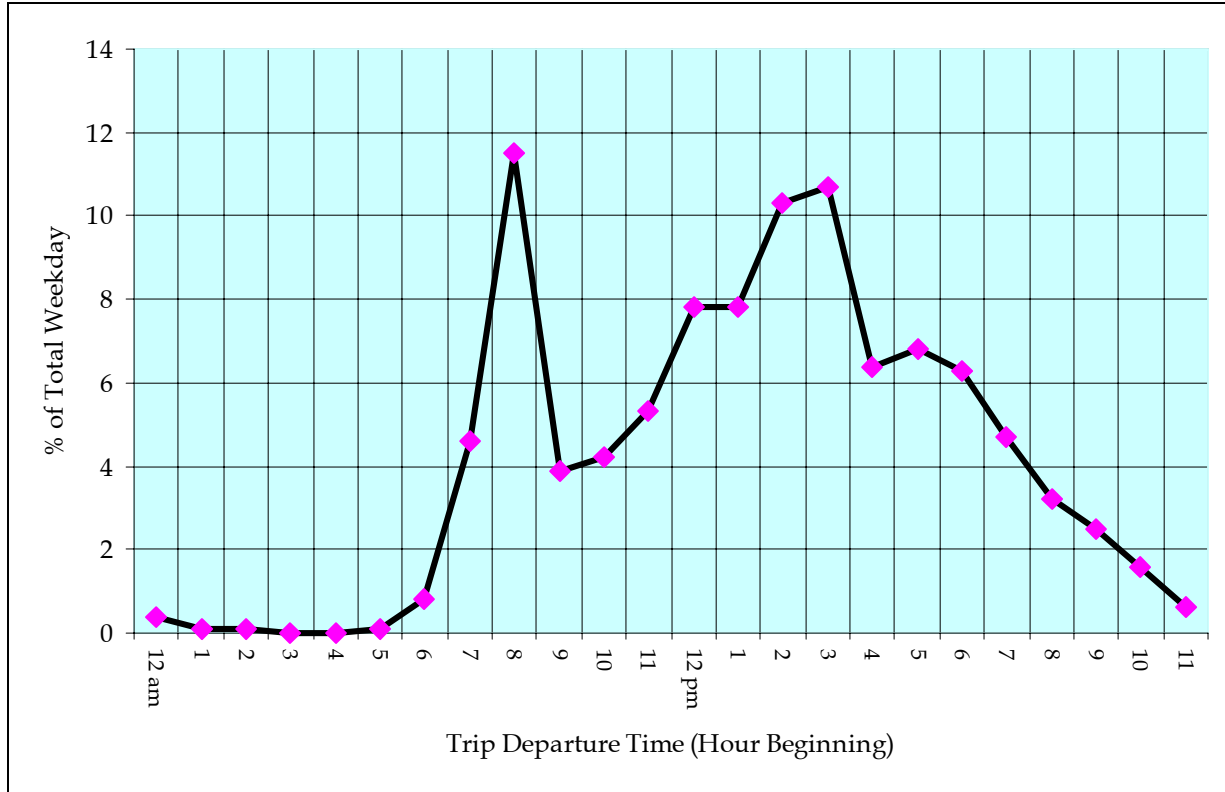


Table 139
Diurnal Distribution - Time Period - Non-Motorized Weekday Trips

Time Period	NYC Total	Long Island	Mid-Hudson (all)	Connecticut	NJTPA	Mercer	Total
Owl 12am-6am	0.9	1.2	0.4		0.7		0.8
AM Peak 6-10am	20.2	19.8	22.0	20.6	23.4	26.3	20.9
Midday 10am-4pm	43.5	55.8	51.1	48.7	50.1	49.5	46.1
PM Peak 4-8 pm	25.9	18.9	22.3	25.7	20.3	21.2	24.2
Evening 8pm-12 am	9.4	4.3	4.2	5.0	5.5	3.0	7.9
Total: Weekday	100.0	100.0	100.0	100.0	100.0	100.0	100.0

4.8.3 Purpose

The distribution of trip purposes for walk and other non-Motorized travel is shown in **Table 140**. The largest shares of these trips are made as “other (non-Home or Work” (20.1%) and “at work-other” (13.6%). Social recreational travel is served by walking for a substantial share as well – about 8% from Home, and about 9% returning home.

Table 140
Trip Purpose- By County Group of Trip Origin - Non-Motorized Weekday Trips

Trip Purpose	NYC Total	Long Island	Mid-Hudson (all)	Connecticut	NJTPA	Mercer	Total: Metro Area
Home to Work	2.9	2.2	3.1	4.5	4.0	2.0	3.1
Home to School	5.9	7.8	7.9	8.4	9.0	8.8	6.8
Home to Social Recreation	7.7	8.7	11.3	9.8	8.2	10.8	8.1
Home to Personal Business	4.3	4.1	4.1	5.3	3.1	5.9	4.1
Home to Shop	5.7	2.2	3.0	1.4	3.3	2.9	4.7
Home to Serve Pass	4.0	4.1	2.0	7.9	4.6	2.9	4.1
Home to Other Purpose	1.4	1.4	0.6		1.0		1.2
Work to Home	2.3	2.1	3.1	3.8	3.7	3.9	2.6
School to Home	5.1	9.1	8.2	10.3	10.8	6.9	6.7
Social Recreation to Home	9.2	8.9	10.7	9.6	9.0	9.8	9.2
Personal Business to Home	3.4	3.1	3.0	4.3	2.6	4.9	3.3
Shop to Home	7.7	2.1	3.2	1.7	4.6	2.9	6.3
Serve Pass to Home	3.1	4.0	1.3	8.6	4.0	4.9	3.4
Other Purpose to Home	1.2	1.6			0.9		1.1
At Work-Work Related	1.4	2.9	3.8	1.0	0.9	1.0	1.5
At Work-Other	13.5	18.5	16.5	13.6	11.4	16.7	13.6
Other (non-Home or Work)	21.4	17.1	18.5	9.8	18.9	15.7	20.1
Total: All Purposes	100.0	100.0	100.0	100.0	100.0	100.0	100.0

4.8.4 Trip Length

Table 141 shows the average trip length for each of the non-Motorized types of trips. The mean average walk trip is a little more than one mile long (1.2 miles), while the average bicycle trip is about 2 miles long. The mean trip length for non-Motorized trips in New York City is 0.8 miles as shown in **Table 142**.

Table 141

Travel Time, Distance length for miles), while the av.c.8 miles

The trip length distribution by distance interval is shown in **Table 143** and in **Table 144**. This exhibit indicates that about two-thirds (61.5%) of these walk and other non-Motorized trips are less than one-half mile long, and another one-fifth (20.7%) are still less than one mile.

Table 143
Trip Distance (Ranges) - By County Group of Trip Origin - Non-Motorized Weekday Trips

Trip Distance (Miles)	NYC Total	Long Island	Mid-Hudson (all)	Connecticut	NJTPA	Mercer	Total
< .5 Mile	65.6	49.0	58.9	66.5	50.7	52.2	61.5
.5-1 Mile	21.1	23.2	21.4	13.0	19.1	20.7	20.7
1-3 Miles	10.5	21.1	12.4	17.7	21.7	18.5	13.5
3-5 Miles	1.3	0.7	1.9	0.3	1.8	1.1	1.4
5-10 Miles	1.0	1.4	1.9	0.6	1.7	2.2	1.2
10-15 Miles	0.2	0.5	1.1		1.1	1.1	0.4
15-20 Miles	0.1	0.1			0.6		0.2
20-30 Miles	0.1	1.8	1.6		0.8		0.4
30-40 Miles	0.0	1.1	0.5	0.6	1.5	1.1	0.4
40-60 Miles	0.1			1.1	0.7	3.3	0.2
60 + Miles	0.0	1.1	0.5	0.3	0.4		0.2
Total: Weekday	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 144
Trip Distance (Ranges) - By Sub-Mode - Non-Motorized Weekday Trips

Trip Distance (Miles)	Bicycle	Skates	Wheel-chair	Walk (only)	Total: Non-Motorized
< .5 Mile	28.8	60.0	46.2*	62.3	61.5
.5-1 Mile	19.6	5.0	46.2*	20.7	20.7
1-3 Miles	36.5	30.0		12.9	13.5
3-5 Miles	9.2			1.2	1.4
5-10 Miles	3.4			1.1	1.2
10-15 Miles	1.5			0.4	0.4
15-20 Miles				0.2	0.2
20-30 Miles	0.9	5.0		0.3	0.4
30-40 Miles			7.7*	0.4	0.4
40-60 Miles				0.2	0.2
60 + Miles				0.2	0.2
Total: Weekday	100.0	100.0	100.0	100.0	100.0

* Too few cases in sample to support a useful estimate

4.8.5 Person Hours of Travel

The total amount of time spent in travel by walking and non-Motorized travel in the region on a typical weekday can be estimated with the *RT-HIS* data. For these trips, this is represented as total person hours of travel (PHT) by non-Motorized means. The distribution of non-Motorized person hours of travel by trip travel time interval is found in **Table 145** by County Group of trip origin, and in **Table 146** by specific means of travel.

Table 145
Distribution of Person Hours of Travel (PHT) - By Trip Travel Time -
By County Group of Trip Origin - Non-Motorized Weekday Trips

Trip Time (Minutes)	NYC Total	Long Island	Mid-Hudson (all)	Connecticut	NJTPA	Mercer	Out of Region	Total
< 5 Minutes	37.3	45.1	46.1	58.9	42.9	39.8	57.1	39.7
5-10 Mins.	25.1	18.9	21.5	16.8	23.0	27.8	14.3	24.0
10-20 Mins.	25.4	24.4	22.3	13.4	24.2	23.1	28.6	24.6
20-30 Mins.	7.6	6.7	5.5	9.0	5.8	8.3		7.2
30-40 Mins.	1.1	1.4	1.3	0.5	1.4			1.2
40-50 Mins.	1.3	2.1	1.9	1.3	0.9			1.3
50-60 Mins.	1.0	0.8	0.5		0.8	0.9		0.9
60-90 Mins.	0.6	0.6	0.3		0.6			0.6
90 + Mins.	0.6		0.5		0.4			0.5
Total: Weekday	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 146
Distribution of Person Hours of Travel (PHT) - By Trip Travel Time -
By Sub-Mode - Non-Motorized Weekday Trips

Trip Time (Minutes)	Bicycle	Skates	Wheel-chair	Walk (only)	Total: Non-Motorized
< 5 Minutes	26.5	20.8	30.8*	40.1	39.7
5-10 Mins.	16.5	8.3	23.1*	24.2	24.0
10-20 Mins.	29.6	70.8	15.4*	24.4	24.6
20-30 Mins.	12.5			7.1	7.2
30-40 Mins.	4.0		23.1*	1.1	1.2
40-50 Mins.	5.1			1.2	1.3
50-60 Mins.	2.3		7.7*	0.9	0.9
60-90 Mins.	0.9			0.6	0.6
90 + Mins.	2.6			0.5	0.5
Total: Weekday	100.0	100.0	100.0	100.0	100.0

* Too few cases in sample to support a useful estimate

APPENDIX A

Personal Diary Form
For *RT-HIS*



**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.

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

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

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

A few 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)

- My Home
- My Regular Workplace
- My School
- 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

From Place #1, did you go to another place during your 24-hour day?

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



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

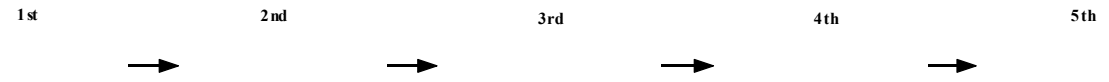
&
Nearest Cross Streets

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.



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



e #

- My Home
- My Regular Workplace
- My School
- Other Place
(address already provided)
- A New Place →

Name of Place (if any)

Street Address

City

State

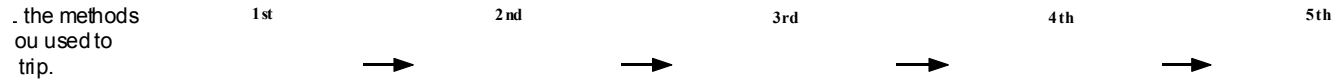
Zip

&
Nearest Cross Streets

At WHAT TIME did you ARRIVE at Place #3?

: _____ am/pm

How do you get from Place #2 to Place #3?



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

YES- At what time did you leave? (P)599.7(1879.1 ac)49.1e()Xo

NEXT PLACE #4

Place #
4

- 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 _____

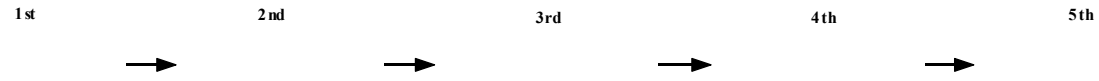
_____ & _____
Nearest Cross Streets

At WHAT TIME did you ARRIVE at Place #4?

_____ : _____ am/pm

HOW did you get from Place #3 to Place #4?

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



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 # 4? (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 a ctivity at other place
- Schod at regular place
- School activity at other place
- Sleep
- Other activities at home

From Place #4 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 #4 to go to Place #5?

_____ : _____ am/pm



Place #
5

- 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

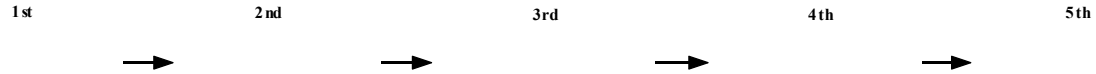
&
Nearest Cross Streets

At WHAT TIME did you ARRIVE at Place #5?

_____ : _____ am/pm

HOW did you get from Place #4 to Place #5?

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



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 # 5? (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 #5 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 #5 to go to Place #6?

_____ : _____ am/pm



Place #
6

- My Home
- My Regular Workplace
- My School
- Other Place (address already provided)
- A New Place →

Name of Place (if any) _____

Street Address _____

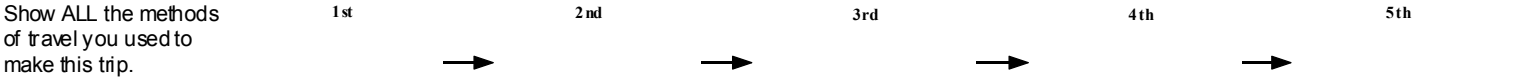
City _____ State _____ Zip _____

_____ & _____
Nearest Cross Streets

At WHAT TIME did you ARRIVE at Place #6?

_____ : _____ am/pm

HOW did you get from Place #5 to Place #6?



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 # 6? (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 #6 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 #6 to go to Place #7?
_____ : _____ am/pm



Place #
7

- 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

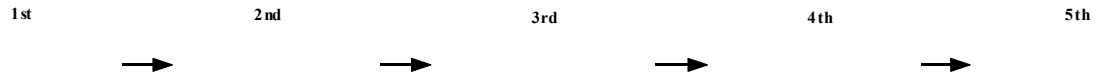
&
Nearest Cross Streets

At WHAT TIME did you ARRIVE at Place #7?

_____ : _____ am/pm

HOW did you get from Place #6 to Place #7?

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



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 # 7? (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 #7 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 #7 to go to Place #8?

_____ : _____ am/pm



Place #
8

- 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 #8?

: _____ am/pm

HOW did you get from Place #7 to Place #8?

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 # 8? (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 #8 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 #8 to go to Place #9?
: _____ am/pm



Place #
9

- 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

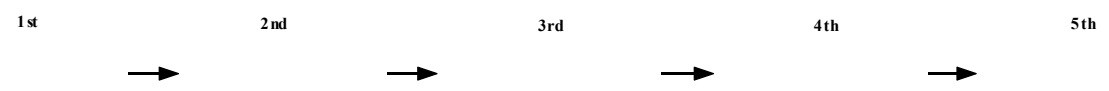
&
Nearest Cross Streets

At WHAT TIME did you ARRIVE at Place #9?

: _____ am/pm

HOW did you get from Place #8 to Place #9?

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



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 #9? (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 #9 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 #9 to go to Place #10?

: _____ am/pm



Place #
10

**WHAT is
Place #10?**

Name of Place (if any)

Street Address

City

State

Zip

&
Nearest Cross Streets

**At WHAT TIME
did you ARRIVE
at Place #10?**

: _____ am/pm

HOW did you get from Place #9 to Place #10?

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 # 10? (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 #10 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 #10 to go to Place #11?
: _____ am/pm



Place #
11

**WHAT is
Place #11?**

**At WHAT TIME
did you ARRIVE
at Place #11?**

Name of Place (if any)

Street Address

City

State

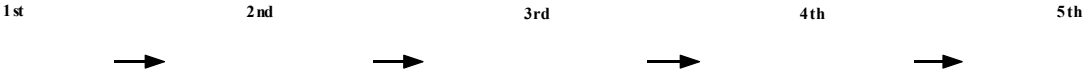
Zip

&
Nearest Cross Streets

: _____ am/pm

HOW did you get from Place #10 to Place #11?

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



**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 # 11? (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 #11 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 #11 to
go to Place #12?

: _____ am/pm



Place #
12

- 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 _____

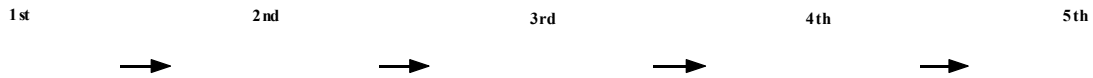
_____ & _____
Nearest Cross Streets

At WHAT TIME did you ARRIVE at Place #12?

_____ : _____ am/pm

HOW did you get from Place #11 to Place #12?

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



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 # 12? (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 #12 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 #12 to go to Place #13?

: _____ am/pm



Did you have a particularly busy day?

Use the chart below to keep information on other places you went to, after you have filled out all of the

WHAT is Place #:	WHEN did you arrive?	HOW did you get there?	What did you do there?	What time did you leave?
<i>13</i>				
<i>14</i>				
<i>15</i>				
<i>16</i>				
<i>17</i>				
<i>18</i>				

APPENDIX B

Data Items Matrix
RT-HIS

**NYMTC / NJTPA Regional Travel - Household Interview Survey
Appendix B: Matrix of Data Items**

Item #	Var Name	Variable Description	Data File	Flt Wd	Flt Typ	Coll Stage	HH Pack	Verify Stage	Formal and Full Text	Values	Comments & References
A-1	SAMPNO	Household ID Number	HH/PER/VEH/TRP	9	N	A	None	NA		NA	Sampno in HH, Pers, Veh, and Trip Files(Unique ID)
PT-1	PERSNO	Person ID Number	PER/TRP	3	N	REC	None	Retr			Person Number in Person and Trip files
H-1	*(See A-1)	HH ID Number	HH/PER/VEH/TRP								
H-2	PHONE	HH Phone number	HH	12	C	REC	None	NA		NA	
H-3	HH_ADDR	Home Locator Code	HH	11	N	REC	None	NA			Locator Code for HH addr.
H-4	QUEST	CATI Record	HH	5	N	REC	None	NA			
H-5	ADVLT	Advance Letter	HH	1	N	REC	None	NA	Did you receive the letter?	1=Yes; 2=No; 8=Don't know; 9=Refused	
H-6	ATHOME	At Home	HH	1	N	REC	None	NA	Have I reached you at your home?		
H-7	TOTVEH	Number of HH vehicles	HH	2	N	REC	V list	Retr	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?	Ordinal Variable; 98=Don't know; 99=Refused	
H-8	DWELL	Dwelling type	HH	1	N	REC	None	None	Do you live in a ...	Code Set 4	
H-9	DWEL0	Dwelling type (if other)	HH	25	C	REC	None	None	If other, specify		
H-10	DWELN	Number of Apartments	HH	4	N	REC	None	None	Number of apartment units (if residence is an apartment building)		Ask only if respondent lives in apt. blg.
H-11	YRMOV	Year moved in	HH	2	N	REC	None	None	When did you move into this home? Was it...	1=Within the past year; 2=1 to 5 years ago; 3=More than 5 years ago; 8=Don't know; 9=Refused	Useful xcheck to Census data
H-12	RENT	Own/rent	HH	1	N	REC	None	None	Do you own or rent your home?	1=Rent; 2=Own/buying (Paying off mortgage); 3=Other (specify ____); 8=Don't know; 9=Refused	Useful xcheck to Census data
H-13	RENT0	Own/rent	HH	25	C	REC	None	None	If other, specify		
H-14	DIARY	Diary Mailing Address	HH	1	N	REC	Label	Rem	Where would you like to receive your diaries?	1 = At home; 2 = P.O. Box; 3=Another address; 8=Don't know; 9=Refused	
H-15	ENGL	Other language spoken	HH	1	N	REC	None	None	Is there anyone in your household who does not understand English?	1=Yes; 2=No; 8=Don't know; 9=Refused	
H-16	HELP	Help fill out	HH	1	N	REC	None	Retr	Will you or anyone else in your household be able to help them to fill out the diaries?	1=Yes; 2= No; 8=Don't know; 9=Refused	
H-17	LANG	Specific language	HH	2	N	REC	None	None	What is the language they understand?	Code set 6	
H-18	NHELP	Help from friend or neighbor	HH	1	N	REC	None	Retr	Is there anyone else, a friend or a neighbor, who can help this person fill out the diary?	1=Yes; 2= No; 8=Don't know; 9=Refused	
H-19	HHSIZE	HH size	HH	2	N	REC	P list	Retr	How many household members, including yourself, all infants and live-in domestic help live in your household?	Ordinal Variable; 98=Don't know; 99=Refused	
H-20	PHONLINE	No. of HH phone lines	HH	2	N	REC	None	None	How many separate telephone numbers are there to your current home?	Ordinal Variable; 98=Don't know; 99=Refused	
H-21	FAX	No. of fax/modem lines	HH	2	N	REC	None	None	How many of these telephone numbers, if any, are dedicated to a FAX machine or modem?	Ordinal Variable; 98=Don't know; 99=Refused	
H-22	NOPHONE	Days without a phone	HH	1	N	REC	None	None	In the past twelve months, have there been times, even for a few days, when you did not have phone service at home?	1=Yes; 2=No; 8=Don't know; 9=Refused	

**NYMTC / NJTPA Regional Travel - Household Interview Survey
Appendix B: Matrix of Data Items**

Item #	Var Name	Variable Description	Data File	Flt Wd	Flt Typ	Coll Stage	HH Pack	Verify Stage	Formal and Full Text	Values	Comments & References
H-23	NPTIME	How long without a phone	HH	1	N	REC	None	None	How long were you without a phone service?	1=Less than two 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; 6=1 year or more; 8=Don't know; 9=Refused	
H-24	SHPHONE	Shared phone lines	HH	1	N	REC	None	None	Does your household share a phone line with another household?	1=Yes; 2=No;98=Refused ; 99=Don't know	
H-25	SHNUM	No. of households sharing phone line	HH	2	N	REC	None	None	How many households share a phone line with your household?	Ordinal Variable; 98=Don't know; 99=Refused	
H-26	ETHNIC	HH Ethnicity	HH	2	N	REC	None	None	Which of the following best describes your ethnicity?	Code set 7	
H-27	ETHNICO	HH Ethnicity - Other	HH	25	C	REC	None	None	If other, specify		
H-28	INCOME	Total 1995 annual household income	HH	2	N	REC	None	Retr	What was your total household income last year from all sources before taxes, for all members of your household?	Code Set 3	
H-29	ASSIGN	Travel Day	HH	3	C	REC	None	Rem	Travel Day		
H-30	EXPOT	Expected out-of-town visitors	HH	1	N	REC	None	Retr	Are you expecting any out-of-town guests at your home on travel day?	1=Yes; 2=No;8=Don't Know ; 9=Refused	
H-31	APPT	Best time to call	HH	1	N	REC	None	None	Would you prefer to be called	1=Morning; 2=Afternoon; 3=Evening; 4=No best time; 9=Don't know/Refused	
H-32	DIFFPHON	Call back at different phone	HH	1	N	REC	None	None	Is there a different phone number where you or another HH member would prefer to be called when we collect your information?	1=yes; 2=no; 8=don't know; 9=refused	
H-33	TEL02	Different phone number	HH	12	C	REC	None	None	What is that number?		
H-34	NUMPLACE	Number of places HH members visited	HH	3	N	RET	None	None			Summary variable
H-35	RETDISP	Retrieval Disposition	HH	6	N	RET	None	None		Code Set 29	
H-36	ENTDISP	Data Entry Status	HH	6	N	ENT	None	None		13=Partial Entry; 20=Entered	
H-37	EDITDISP	Edit Check Status	HH	6	N	EDIT	None	None		13=In process; 20=completed	
H-38	COMMVEH	Commercial vehicle trips	HH	2	N	RET			How many commercial vehicles arrived at your home to deliver packages, perform repairs, or provide other services during your assigned travel day (Excluding mailman)?	Ordinal Variable; 97=97 or more; 98=Don't know; 99=Refused	
H-39	OUTTOWN	Out-of-town visitors on travel day	HH	2	N	RET			How many out-of-town visitors stayed at this residence during the travel day?	Ordinal Variable; 97=97 or more; 98=Don't know; 99=Refused	
V-1	*(See A-1)	HH ID Number	HH/PER/VEH/TRP								
V-2	VEHNUM	Vehicle Number	VEH	2	N	REC	V list	Retr	Vehicle Number		Vehicle Number in vehicle file
V-3	YEAR	Vehicle X - Year	VEH	2	N	REC	V list	Retr	What is the year of your vehicle? If two or more: 'What is the year of vehicle number one, that is, the one that is used the most?	99=Don't know / Refused	repeat for up to 8 vehicles in HH
V-4	TYPE	Vehicle X -Type	VEH	2	N	REC	V list	Retr	What is the body type? IF two or more: What is the body type of vehicle number one, that is, the one is used the most?	Code Set 19	repeat for up to 8 vehicles in HH

NYMTC / NJTPA Regional Travel - Household Interview Survey
Appendix B: Matrix of Data Items

Item #	Var Name	Variable Description	Data File	Fld Wd	Fld Typ	Coll Stage	HH Pack	Verify Stage	Formal and Full Text	Values	Comments & References
V-5	TYPE_OT	Vehicle X - Other type	VEH	25	C	REC	V list	Retr		Verbatim text for uncoded "other" responses	Body Type other that in code set 19
V-6	VHOWN	Vehicle X - vehicle ownership	VEH	1	N	REC	V list	Retr	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	repeat for up to 8 vehicles in HH
P-1	*(See A-1)	HH ID Number	HH/PER/VEH/ TRP								
P-2	*(See PT-1)	Person ID Number	PER/ TRP								
P-3	GENDER	Person X -Gender	PER	1	N	REC	P list	Retr	What is X's gender?	1=Male; 2=Female; 3=Head of Household Male; 4=Head of Household Female; 8=Don't Know; 9=Refused	
P-4	AGE	Person X -Age	PER	2	N	REC	P list	Retr			

**NYMTC / NJTPA Regional Travel - Household Interview Survey
Appendix B: Matrix of Data Items**

Item #	Var Name	Variable Description	Data File	Fld Wd	Fld Typ	Coll Stage	HH Pack	Verify Stage	Formal and Full Text	Values	Comments & References
P-21	E1JOB	Employer	PER	1	N	REC	None	None	Is his/her /your employer ...	Code Set 14	
P-22	E1JOBO	If employer=other	PER	40	C	REC	None	None	Other Resp for employer ...		
P-23	W1IND	Industry	PER	2	N	REC	None	None	What activity best describes his/her/your job?	Code Set 15	
P-24	W1INDO	Industry - Other	PER	20	C	REC	None	None			
P-25	W1OCC	Occupation	PER	2	N	REC	None	None	How would you describe his/her/your occupation?	Code Set 16	
P-26	W1OCCO	Occupation - Other	PER	20	C	REC	None	None			
P-27	W1TIM	Length of time at main job	PER	2	N	REC	None	None	How long has/have he/she/you been working at his/her/your current job?	1=Less than a year; 2=1 to 5 years; 3=More than 5 years; 8=Don't know; 9=Refused	
P-28	W1DAY	Weekdays per week at job	PER	1	N	REC	None	None	On average, how many weekdays per week does/do he/she/you work at this job, regardless of location?	Ordinal Var; 8=Refused; 9=Don't know	
P-29	W1HOM	Telecommuting days	PER	1	N	REC	None	None	On average, how many days per week does/do he/she/you work at home instead of the regular workplace? Sometimes this is called telecommuting.	Ordinal Var; 97=Other(specify_____) (This includes once a month); 98=Don't know; 99=Refused	
P-30	W1HOMO	Telecommuting days - other	PER	15	C	REC	None	None		If number of days is other than code set	
P-31	W1CPR	Compressed work week	PER	1	N	REC	None	None	Does/Do he/she/you work a compressed work week such as 80 hrs in 9 days or 40 hrs in 4 days	1=Yes; 2=No; 8=Don't know 9=Refused;	
P-32	W1CPR TYP	Type of compressed work week	PER	1	N	REC	None	None	Does/Do he/she/you work four days per week (4/40) or nine days (9/80) per two weeks?	1=9/80 2=4/40 3=Other (Specify_____) 8=Don't know 9=Refused	
P-33	W1CPR TO	Type of compressed work week - other	PER	20	C	REC	None	None			Only if W1TPR = 3
P-34	W1WKE	Weekend work	PER	1	N	REC	None	None	On average, how many weekend days per week does/do he/she/you work at this job, regardless of location?	Ordinal Var; 8=Refused; 9=Don't know	
P-35	W1WKD	Weekend work detail	PER	1	N	REC	None	None	When in the weekend does/do he/she/you work?	1=SaturdayAM; 2=SaturdayPM; 3=Sunday AM; 4=Sunday PM; 5=Other(Specify____); 8=Don't know; 9=Refused	Multivalued response OK
P-36	W1NAM	Code for if know job name	PER	2	N	REC	None	None	Code to show if resp knows employer name		
P-37	W1NAMF	Main Job name	PER	60	C	REC	None	Retr	Employer Name		
P-38	W1ADD TYP	Main Job address flag	PER	1	N	REC	None	None	Main job address flag	Code Set 8	
P-39	W1_LOC	Locator code for work addr	PER	11	N	REC	None	None	Locator code for Work Address		
P-40	W1MODE	Mode to work	PER	2	N	REC	None	None	What does/do he/she/you use most often to get to work? Multiple responses allowed but not explicitly requested.	Code Set 13	This coding scheme distinguishes driver from passenger for car mode
P-41	W1MODEO	If other, specify	PER	20	C	REC	None	None			

**NYMTC / NJTPA Regional Travel - Household Interview Survey
Appendix B: Matrix of Data Items**

Item #	Var Name	Variable Description	Data File	Fld Wd	Fld Typ	Coll Stage	HH Pack	Verify Stage	Formal and Full Text	Values	Comments & References
P-42	W1NEEDV	Vehicle for work	PER	1	N	REC	None	None	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	
P-43	W1CPARK	Cost to park vehicle at work (dollar figure)	PER	6	N	REC	None	None	How much does it cost him/her/you to park at work? (If he/she/you doesn't/don't drive estimate how much parking would cost).		
P-44	W1CPUNIT	Cost to park vehicle at work - Unit	PER	1	N	REC	None	None		0=Free/Employer provided;1=Per hour; 2=per day; 3=per week; 4=per month; 5=per quarter; 6=per semester;8=Don't know; 9=Refused	
P-45	W1EMPPRK	Employer subsidize parking?	PER	1	N	REC	None	None	Does his/her/your employer offer to pay all or part of the cost of parking at work?	1=Yes; 2=No; 8=Don't know; 9=Refused	
P-46	W1PERCP	Personal cost to park vehicle at work (dollar figure)	PER	6	N	REC	None	None	How much does it cost him/her/you personally to pay to park? (If he/she/you doesn't/don't drive, please estimate how much parking would cost).		We need to distinguish between actual & hypothetical or estimate
P-47	W1PERCPU	Personal cost to park vehicle at work - Unit	PER	1	N	REC	None	None	How much does it cost him/her/you to park at work?	0=Free/Employer provided;1=Per hour; 2=per day; 3=per week; 4=per month; 5=per quarter; 6=per semester;8=Don't know; 9=Refused	
P-48	W1WHPRK	Where park at work	PER	1	N	REC	None	None	What kind of parking does/do he/she/you use at work? If he/she/you doesn't/don't drive, what kind of parking would he/she/you use if he/she/you did drive regularly?	1=In a parking lot or garage at work; 2=In a parking lot or garage off-site; 3=On the street; 4=Garage/parking lot at home;8=Don't know; 9=Refused	The "usually don't drive" will be analytically coded from other variables
P-49	W1WLKTIM	Time to walk to work from parking location	PER	2	N	REC	None	None	Approximately how long (in minutes) is the walk from this parking area to his/her/your work?	Ordinal variable; 98=Don't know;99=Refused	Minutes
P-50	TRNST	Employer subsidize transit	PER	1	N	REC	None	None	Does his/her/your employer offer Transitcheck or some other way to pay for all or part of the cost of bus/rail passes?	1=Yes, all or part; 2=No; 8=Don't know; 9=Refused	
P-51	VTRAN	Use transit subsidy	PER	1	N	REC	None	None	Does/Do he/she/you take advantage of it?	1=Yes; 2=No; 8=Don't know; 9=Refused	
P-52	TRANCOST	Cost of using transit (dollar figure)	PER	6	N	REC	None	None	What does it personally cost him/her/you to buy a bus/rail pass?		
P-53	TRNCSTU	Cost of using transit - Unit	PER	1	N	REC	None	None		1=per day;2=per week;3=per month;4=per year;8=Don't know; 9=Refused	
P-54	SCHED	Constant schedule	PER	1	N	REC	None	None	At his/her/your main job, does he/she/you work a schedule or shift that changes on a regular basis?	1=Yes; 2=No; 8=Don't know; 9=Refused	
P-55	WSTIM	Work start time	PER	4	N	REC	None	None	What time does he/she/you typically start work at his/her/your job?		If schedule rotates, answer on current shift?
P-56	WETIM	Work end time	PER	6	C	REC	None	None	What time does he/she/you typically end work at his/her/your main job?		
P-57	SETIME	Change in work times	PER	1	N	REC	None	None	Are his/her/your start and end times at this job about the same every day?	1=Yes; 2=No; 8=Don't know; 9=Refused	
P-58	VSTIME	Variation in work start time	PER	1	N	REC	None	None	How much can his/her/your job's start time vary from the usual start time?	Code Set 17	
P-59	VETIME	Variation in work end time	PER	1	N	REC	None	None	How much can his/her/your job's end time vary from the usual end time?	Code Set 18	

**NYMTC / NJTPA Regional Travel - Household Interview Survey
Appendix B: Matrix of Data Items**

Item #	Var Name	Variable Description	Data File	Fld Wd	Fld Typ	Coll Stage	HH Pack	Verify Stage	Formal and Full Text	Values	Comments & References
P-60	W2NMF	2nd Job name flag	PER	1	N	REC	None	Retr		1=Self employed Home 2=Self employed - not home 7=Other Specify _____) 9=Refused 8=Don't know	
P-61	W2NAME	2nd Job name	PER	20	C	REC	None	Retr	What is the name of his/her second employer?		
P-62	W2TYP	Company type	PER	2	N	REC	None	None	Is his/her second employer ...	Code Set 14	
P-63	W2TYPO	2nd Job Type (other)	PER	30	C	REC	None	None	Second Job Type	Code Set 14	
P-64	W2ADTYP	2nd Job address flag	PER	2	N	REC	None	Retr	What is the address of his/her second job?	Code Set 8	
P-65	W2_LOC	Locator code for Job 2 addr	PER	11	N	REC	None	Retr	Locator code for work two address		
P-66	W2IND	Industry for Job 2	PER	2	N	REC	None	None	What activity best describes his/her/your second job?	Code Set 15	
P-67	W2INDO	Other Industry for Job 2	PER	30	C	REC	None	None			
P-68	W2OCC	Occupation	PER	2	N	REC	None	None	How would you describe his/her/your occupation at your second job?	Code Set 16	
P-69	W2OCCO	Occupation - Other	PER	20	C	REC	None	None			
P-70	W2DAY	Days worked per week at second job	PER	2	N	REC	None	None	On average, how many days per week does he/she/you work at his/her/your second job?	Ordinal Var; 8=Don't know; 9=Refused	
P-71	W2HOME	Days worked at home for second job	PER	2	N	REC	None	None	On average, how many days per week does he/she/you work at home for his/her second job instead of going to his/her workplace? Sometimes this is called telecommuting.	Ordinal var, 97=Other(specify _____) (This includes once a month); 98=Don't	
P-72	W2HOMEO	Days worked at home for second job - Other	PER	20	C	REC	None	None			
P-73	W2STIME	Work start time	PER	4	N	REC	None	None	What time does/do he/she/you typically start work at his/her/your second job?		
P-74	W2ETIME	Work end time	PER	4	N	REC	None	None	What time does/do he/she/you typically end work at his/her/your second job?		
P-75	PNUMPL	Number of places visited	PER	3	N	RET	None	None			Summary Variable
P-76	VERWORK	Verify work trip	PER	1	N	RET	None	None			
P-77	VERWORKC	If not, why?	PER	20	C	RET	None	None			
P-78	VERSCHL	Verify school trip	PER	1	N	RET	None	None			
P-79	VERSCHLC	If not, why?	PER	20	C	RET	None	None			
P-80	HMALLDAY	If respondent did not travel, why?	PER	20	C	RET	None	None	Respondent Home All Day?		
P-81	FNAME	First Name	PER	20	C	REC	P list	Retr	What is the first name?		
P-82	LNAME	Last Name	PER	20	C	REC	P list	Retr	Is the last name the same as yours?		
T-1	*(See A-1)	HH ID Number	HH/PER/VEH/TRP								
T-2	*(See PT-1)	Person ID Number	PER/TRP								
T-3	PLACENO	Place Number	TRP	2	N	RET	None	Edit			
T-4	NOSTOP	Stops on the way	TRP	1	N	RET	None	Edit	Confirm that there were no stops on the way.	1=Yes; 2=No	
T-5	INTP	Proxy reporting	TRP	1	N	RET	None	None	Interviewed in person?	1=Yes; 2=No; 3=Diary Mailed in	
T-6	PDIARY	Diary Use	TRP	1	N	RET	None	None	Did person use the diary?	1=Yes; 2=No	
T-7	PREP	If proxy, person reporting	TRP	30	C	RET	None	None	If proxy, person reporting.		
T-8	PNOPREP	If proxy, persno reporting	TRP	2	N	RET	None	None	If proxy, persno reporting.		

NYMTC / NJTPA Regional Travel - Household Interview Survey
Appendix B: Matrix of Data Items

Item #	Var Name	Variable Description	Data File	Fld Wd	Fld Typ	Coll Stage	HH Pack	Verify Stage	Formal and Full Text	Values	Comments & References
T-9	CTRLTRIP	Number of Places	TRP	2	N	RET	None	Edit	How many places did you visit during your diary day?		
T-10	PLACTYP	Location Identifier	TRP	1	N	RET	None	Edit	What type of place did you go to next?	1=Home; 2=Regular Workplace; 3= School; 4=Another place	
T-11	PL_LOC	Place code in location table	TRP	11	N	RET	None	Edit	Place code in location table		
T-12	ACT1	Activity 1	TRP	2	N	RET	None	Edit	What did you do here?	Code Set 20	
T-13	ACT2	Activity 2	TRP	2	N	RET	None	Edit	What did you do here?	Code set 20	
T-14	ACT3	Activity 3	TRP	2	N	RET	None	Edit	What did you do here?	Code set 20	
T-15	ACT4	Activity 4	TRP	2	N	RET	None	Edit	What did you do here?	Code set 20	
T-16	ACT5	Activity 5	TRP	2	N	RET	None	Edit	What did you do here?	Code set 20	
T-17	ACT6	Activity 6	TRP	2	N	RET	None	Edit	What did you do here?	Code set 20	
T-18	ACT_O	Activity - Other	TRP	20	C	RET	None	Edit	What did you do here?	Other Activities not in Code Set 20	
T-19	TRAN1	First Transport Mode	TRP	2	N	RET	None	Edit	How did you get here?	Code Set 27	
T-20	TRAN2	Second Transport Mode	TRP	2	N	RET	None	Edit	How did you get here?	Code Set 27	
T-21	TRAN3	Third Transport Mode	TRP	2	N	RET	None	Edit	How did you get here?	Code Set 27	
T-22	TRAN4	Fourth Transport Mode	TRP	2	N	RET	None	Edit	How did you get here?	Code Set 27	
T-23	TRAN5	Fifth Transport Mode	TRP	2	N	RET	None	Edit	How did you get here?	Code Set 27	
T-24	TRAN6	Sixth Transport Mode	TRP	2	N	RET	None	Edit	How did you get here?	Code Set 27	
T-25	HHVU	Household Vehicle Used	TRP	1	N	RET	None	Edit	Did you use any of your household vehicles to get here?	1=Yes; 2=No	
T-26	HHVEHNO	HH vehicle number	TRP	2	N	RET	None	Edit	Which vehicle?		Vehicle number corresponds to the number in the vehicle file
T-27	ADP	Auto Driver/Passenger	TRP	1	N	RET	None	Edit	Were you the driver or the passenger?	1=Driver; 2=Passenger	
T-28	NPERVEH	Occupants in the Vehicle	TRP	2	N	RET	None	Edit	How many people were in the vehicle including yourself?		
T-29	NHHTRAV	HH members traveling	TRP	2	N	RET	None	Edit	How many household members were traveling with you?		
T-30	THMEMN	HH member number	TRP	20	C	RET	None	Edit	Who? (Person #):		
T-31	NNONTRAV	Non HH members traveling	TRP	2	N	RET	None	Edit	How many non-household members were traveling with you?		
T-32	PARK	Parking Location	TRP	1	N	RET	None	Edit	If drove to destination: where did you park?	1=Street; 2=Garage; 3=Parking Lot; 4=Other	
T-33	PARKO	Parking - Other	TRP	50	C	RET	None	Edit			
T-34	PARKC	Parking Cost (dollar figure)	TRP	4	N	RET	None	Edit	Cost: \$	Ordinal variable	
T-35	PARKCU	Parking Cost Unit	TRP	5	N	RET	None	Edit	per	1=hour; 2=day, 3=week; 4=month; 5=other	
T-36	PARKCUO	Parking Cost Unit Other	TRP	20	C	RET	None	Edit			
T-37	TOLL	Toll	TRP	1	N	RET	None	Edit	Did you pay any toll?	1=Yes; 2=No; 9=Don't Know	
T-38	TOLLAMT	Toll Amount	TRP	4	C	RET	None	Edit	If yes, how much?		
T-39	ADDP	Auto Driver Drop-off/Pick-Up	TRP	1	N	RET	None	Edit	Did you drop-off or pick-up anyone?	1=Yes; 2=No; 9=Don't Know	
T-40	ADDPHH	HH member dropped	TRP	1	N	RET	None	Edit	Was it a household member?	1=Yes; 2=No; 9=Don't Know	
T-41	ADDPHHN	Member number dropped off	TRP	10	C	RET	None	Edit	If yes, which household member(s)?		
T-42	APDP	Auto Passenger dropped off/picked up	TRP	1	N	RET	None	Edit	Were you dropped off or picked up?	1=Yes; 2=No; 9=Don't Know	
T-43	APDPHH	HH member Driver	TRP	1	N	RET	None	Edit	By a household member?	1=Yes; 2=No; 9=Don't Know	
T-44	APDPHHN	HH member Driver number	TRP	10	C	RET	None	Edit	If yes, who?		
T-45	SUBTR	Boarding Station	TRP	30	C	RET	None	Edit	Where did you board?		Only for Train/subway
T-46	LINE	First Line #	TRP	30	C	RET	None	Edit	1st Line #		
T-47	TRFR	Transfers	TRP	1	N	RET	None	Edit	How many times did you transfer?	Ordinal variable	
T-48	TRFR1ST	First Transfer Station	TRP	30	C	RET	None	Edit	1st Transfer Station Name		

**NYMTC / NJTPA Regional Travel - Household Interview Survey
Appendix B: Matrix of Data Items**

Item #	Var Name	Variable Description	Data File	Fld Wd	Fld Typ	Coll Stage	HH Pack	Verify Stage	Formal and Full Text	Values	Comments & References
T-49	LINE1ST	First Line #	TRP	30	C	RET	None	Edit	1st Transfer Line #		
T-50	TRF2ND	Second Transfer Station	TRP	30	C	RET	None	Edit	2nd Transfer Station Name		
T-51	LINE2ND	First Line #	TRP	30	C	RET	None	Edit	2nd Transfer Line #		
T-52	TRFR3RD	Third Transfer Station	TRP	30	C	RET	None	Edit	3rd Transfer Station Name		
T-53	LINE3RD	First Line #	TRP	30	C	RET	None	Edit	3rd Transfer Line #		
T-54	TRFR4TH	Fourth Transfer Station	TRP	30	C	RET	None	Edit	4th Transfer Station Name		
T-55	LINE4TH	First Line #	TRP	30	C	RET	None	Edit	4th Transfer Line #		
T-56	TRFR5TH	Fifth Transfer Station	TRP	30	C	RET	None	Edit	5th Transfer Station Name		
T-57	LINE5TH	First Line #	TRP	30	C	RET	None	Edit	5th Transfer Line #		
T-58	EXITST	Exit Station	TRP	30	C	RET	None	Edit	At which station did you exit?		
T-59	PAY1	First Transit Payment	TRP	1	C	RET	None	Edit	How did you pay your fare?	Code set 23	
T-60	PAY1O	First Transit Payment - other	TRP	30	C	RET	None	Edit		Mode of payment not in code set 23	
T-61	PAY2	Second Transit Payment	TRP	1	C	RET	None	Edit	How did you pay your fare?	Code set 23	
T-62	PAY2O	Second Transit Payment - Other	TRP	30	C	RET	None	Edit		Mode of payment not in code set 23	
T-63	PAY3	Third Transit Payment	TRP	1	C	RET	None	Edit	How did you pay your fare?	Code set 23	
T-64	PAY3O	Third Transit Payment - Other	TRP	30	C	RET	None	Edit		Mode of payment not in code set 23	
T-65	PAY4	Fourth Transit Payment	TRP	1	C	RET	None	Edit	How did you pay your fare?	Code set 23	
T-66	PAY4O	Fourth Transit Payment - Other	TRP	30	C	RET	None	Edit		Mode of payment not in code set 23	
T-67	TIMEDEPA	Departure Time	TRP	20	C	RET	None	Edit	At what time did you leave this place?	1=AM; 2=PM, 9=Don't Know/Refused	
T-68	TIMEARRI	Arrival Time	TRP	20	C	RET	None	Edit	Arrival Time	9999 = Don't Know/Refused	
L-1	LOCNO	Location ID number	LOC	11	N	RET	None	Edit	Location ID Number		
L-2	LOCTYPE	Location Identifier	LOC	1	N	RET	None	Edit	What type of place did you go to next?	1=Home; 2=Regular Workplace; 3= School; 4=Another place (already gave address); 5=A new place	
L-3	NAME	Place Name of Place X	LOC	30	C	RET	None	Edit	What is the name of the place?		
L-4	ADDRESS	Address of Place X	LOC	30	C	RET	None	Edit	Address		
L-5	CITY	Place X - City	LOC	30	C	RET	None	Edit	City		
L-6	STATE	Place X - State	LOC	2	C	RET	None	Edit	State		
L-7	ZIP1	Place X - Zipcode	LOC	5	N	RET	None	Edit	Zipcode		
L-8	ZIP2	Place X - Zip (last 4 digits)	LOC	4	N	RET	None	Edit	Zipcode (last 4 digits)		
L-9	LATI	Latitude	LOC	15	N	G	None	None	Latitude of address		
L-10	LONGI	Longitude	LOC	15	N	G	None	None	Longitude of address		
L-11	GCSTAT	Geocoding Status	LOC	1	C	G	None	None	Geocoding Status	M=Matched U=Unmatched V=Address updated, needs to be geocoded C=On-screen match, I=Imputed	
L-12	GISCOUNT	GIS Count of # attempts	LOC	2	N	G	None	None	GIS Count		
L-13	CNTYCODE	County Code	LOC	21	N	G	None	None	County Code		
L-14	AV_CITY	Arcview City	LOC	11	C	G	None	None	Arcview		
L-15	AV_ADDRE	Arcview Address	LOC	34	C	G	None	None	Arcview		

Appendix B: Code Set for Data Items

1	
	<p>1=Forms too complex 2=Invade privacy 3=Takes too much time 4=Other family members refuse 5=Other 6=I travel too little 7=I travel too much 8=Refused 9=Don't know</p>
2	
	<p>1=HH member out of the region during diary day 2=HH member was no longer living at this address 3=Other permanent deduction in HH size 4=New household member born 5=New household member moved in 6=Other permanent addition to HH size 8=Refused 9=Don't know</p>
3	
	<p>1=Less than \$10k 2=\$10k to < \$15k 3=\$15k to < \$25k 4=\$25k to < \$35k 5=\$35k to < \$50k 6=\$50k to < \$75k 7=\$75k to < \$100k 8=\$100k to < \$125k 9=\$125k to < \$150k 10=\$150k or more 98=Don't Know 99=Refused</p>
4	
	<p>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) 8=Refused 9=Don't know</p>

Appendix B: Code Set for Data Items

5	<ul style="list-style-type: none"> 1=Job-related move 2=Schooling-related move 3=Wanted to move closer in to town 4=Required larger living space 5=Required smaller living space 6=Retirement 7=Childcare-related 8=Combined households 9=Divorce 10=Had been renting, wanted to buy 11=Had been buying, wanted to rent 12=Other (specify) 98=Refused 99=Don't know
6	<ul style="list-style-type: none"> 1=Spanish 2=French 3=German 4=Chinese 5=Italian 6=Tagalog 7=Polish 8=Korean 9=Indic 10=Vietnamese 11=Other (Specify) 98=Refused 99=Don't know
7	<ul style="list-style-type: none"> 1=Black/African American, (non-Hispanic) 2=White, (non-Hispanic) 3=Asian/Pacific Islander 4=American Indian 5=Hispanic 6=Other (specify) 8=Don't Know 9=Refused
8	<ul style="list-style-type: none"> 1=Home 2=Complete street address known/given 3=Cross streets known/given 8=Don't know 9=Refused

Appendix B: Code Set for Data Items

9	<ul style="list-style-type: none"> 1=Self 2=Spouse 3=Son/Daughter 4=Mother/Father 5=Brother/Sister 6=Grandparent 7=Grandchild 8=Live-in help 9=Room-mate/Other non-related 10=Other related 98=Don't Know 99=Refused
11	<ul style="list-style-type: none"> 1=Daycare 2=Preschool 3=Kindergarten to Elementary (K-6) 4=Secondary (7-12) 5=Vocational or technical school 6=College or university 7=Adult school 8=Don't Know 9=Refused
12	<ul style="list-style-type: none"> 1=Sick 2=Regular day off 3=Compressed work week day off 4=Vacation or holiday 5=Family emergency 6=Worked second job 7=Went to different location for business 8=Went to school 9=Telecommuted 97=Other 98=Refused 99=Don't know

Appendix B: Code Set for Data Items

13	
	<p>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 / shuttle 51=Amtrak, Greyhound, Airline, Helicopter 61=Subway (NYC, Staten Island Railway) 62=PATH 63=Newark City Subway 71=Ferry (Roosevelt Island Tram) 81=Commuter Railroad (LIRR, METRO NORTH,NJTRANSIT) 91=Yellow/Medalion Cab 92=For hire van/jitney 93=Black cab car service 94=Gypsy cab 97=Other 98=Don't Know 99=Refused</p>
14	
	<p>1=A private company 2=Government 3=Self-employed 7=Something else (Specify) 8=Don't Know 9=Refused</p>

Appendix B: Code Set for Data Items

15	<ul style="list-style-type: none"> 1=Agriculture/Forestry/Fishing 2=Mining 3=Construction 4=Manufacturing - Nondurable goods 5=Manufacturing - Durable goods 6=Transportation 7=Communications, other public utilities 8=Wholesale trade 9=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 18=Other (Specify) 98=Refused 99=Don't know
16	<ul style="list-style-type: none"> 1=Executive, Admin, or Managerial 2=Professional specialty 3=Technicians or related support 4=Sales 5=Administrative support, clerical 6=Private Household 7=Protective Services 8=Service, except protective and household 9=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
17	<ul style="list-style-type: none"> 0=Start time can't vary 1=Up to 15 minutes 2=16 to 30 minutes 3=31 to 60 minutes 4=More than 1 hour to 2 hours 7=Or Something else...(Specify...) 8=Don't Know 9=Refused

Appendix B: Code Set for Data Items

18	
	<p>0=End time can't vary 1=Up to 15 minutes 2=16 to 30 minutes 3=31 to 60 minutes 4=More than 1 hour to 2 hours 7=Or Something else...(Specify...) 8=Don't Know 9=Refused</p>
19	
	<p>1=Auto 2=Auto-2 seat 3=Van 4=Recreational vehicle 5=Utility vehicle 6=Station wagon 7=Pick-up truck 8=Motorcycle 9=Moped 10=Other (Specify) 98=Don't know 99=Refused</p>
20	
	<p>1=Drop of/pick up someone 2=Visit Fiends/relatives 3=Eat Meals 4=Social/Recreation/Entertainment 5=Shop 6=Doctor/dentist/other professional 7=Other family/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 (Specify)</p>
21	
	<p>1=Private residence 7=Business, store, place 8=Refused 9=Don't know</p>

Appendix B: Code Set for Data Items

22	
	<p>1=Same place as last activity 2=At my home 3=At my main job 4=At my second job 5=At my school or daycare 6=Some other place/location 8=Refused 9=Don't know</p>
23	
	<p>1=Cash 2=Token 3=Weekly Pass 4=Monthly Pass 5=Metro Card 6=Free Transfer 7=Other</p>
24	
	<p>1=Place name only 2=Place and intersection 3=Intersection only 8=Refused 9=Don't know</p>
26	
	<p>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 (Specify) 98=Don't Know 99=Refused</p>

Appendix B: Code Set for Data Items

27	<ul style="list-style-type: none"> 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 / shuttle 51=Amtrak, Greyhound, Airline, Helicopter 61=Subway (NYC or Staten Island Railway) 62=PATH 63=Newark City Subway 71=Ferry (Roosevelt Island Tram) 81=Commuter Railroad (LIRR, METRO NORTH,NJTRANSIT) 91=Yellow/Medalion Cab 92=For hire van/jitney 93=Black cab car service 94=Gypsy cab 97=Other 98=Don't Know 99=Refused
*28	Station Identifiers
29	<ul style="list-style-type: none"> 1=No Answer 2=Busy 3=Answering Machine 4=Call Back - respondent no reached 5=Call Back - specific 6=First Refusal 7=Disconnected 8=Deaf/Language 9=Business/Govt. 10=Computer/Fax 12=2nd Refusal 13=Partial Complete 20=Completed

APPENDIX C

System of Data Edit Checks *RT-HIS*

APPENDIX C

System of 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 make and 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 which takes 6 hours).
- Place numbers must be sequential and inclusive (if the last trip number is 5, the trip file must contain trips 0, 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).

APPENDIX D

Geo-Coding Resources and Procedures
RT-HIS

APPENDIX D

Geo-Coding Resources and Procedures

Geocoding Generally. Prior to geocoding, electronic geographic coverage files are prepared in Environmental Systems Research Institute's ArcView GIS Software. This is a two step process, and both of these steps occur at the beginning of the project only. They are not repeated.

Obtain Coverage Files. NuStats reviewed many geographic coverage files including GDT'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 BLR'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 26-county study area.

Set Up Coverage Files. To make the coverage themes matchable, the files must be set up within ArcView. This step includes joining county files together, setting the properties for matching, and indexing the files on each computer. The computer infrastructure dedicated for the NYMTC *RT-HIS* geocoding includes three Windows95-based Pentium computers each running at 150MHz or faster, with 32MB RAM, an 8X CD-ROM, and 2,000MB local disk space; all are linked to the company's 32-bit 10Mbps Ethernet-Novell network and have continuous Internet access.

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

1. Set Up Event Table. As addresses are submitted for geocoding, an event table of address information is created in dBase format with a field containing concatenated address data. This table is imported into ArcView prior to geocoding.
2. Geocoding. Batch and/or interactive geocoding is performed on all addresses in the files. This includes all three address-types described below. Batch runs are automated processes, and interactive sessions find address matches one at a time.
3. Attach coordinates. During geocoding sessions, when an address is geocoded, ArcView calculates and pulls x/y (latitude/longitude) coordinates for the matched cases. The sessions are then saved and exported to a tabular data file that is used to update a master data file. The unmatched cases would be exported to a separate data file that contains addresses, and manual address research efforts are performed.
4. Address Research. Addresses that do not match are researched and checked against a large array of materials whose sources include Parsons Brinckerhoff, NYMTC, other public agencies, and commercial vendors. The following list categorizes these address research resources.
 - 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)
- Maps, Atlases, Gazetteers, and Street Finders
- Greater Metropolitan New York Area and Long Island, New York City 5 Boroughs, Nassau County, Westchester County, Lower Westchester County, Suffolk County, Bergen/Passaic/Rockland Counties, Lower Fairfield County, Long Island, Hudson County, Manhattan Bus Routes, New York City Subways (Hagstrom)
- New York City 5 Boroughs Street Finder (Rand McNally)
- Special Lists
- Major Employers – 100+ employers – in Nassau County, Putnam County, Westchester County, Long Island (other areas pending)
- School Names/Locations
- Police/Fire Station Addresses
- Buildings/Landmarks/Place names with associated addresses
- “Alias tables” (mentioned above) also come in paper format
- Transit Maps and Schedules
- NYCT Rapid Transit and Bus, Metro-North, Long Island Railroad, Staten Island Railway (MTA Services), MTA Long Island Bus, other bus services (Long Island, NY), Lower Mid-Hudson Valley bus services (Upstate New York), bus and rail services (New Jersey Transit), inter-regional (rail/Amtrak, inter-city bus).
- Telephone Directories covering 26-county area
- Due to the extent and diversity of these holdings, obviously not every resource is 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. Address research with logically applied techniques results in higher geocoding “hit rates.”

5. Re-geocode. An interactive session is run on the researched unmatched cases.

Steps 2 through 5 were repeated until the desired percentage of addresses were geocoded.

APPENDIX E

Statistical Reliability of *RT-HIS* Estimates

Appendix E: Statistical Reliability of RT-HIS Estimates

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.

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:

8. Household income (region and county) [Household file]
9. Household size (region and county) [Household file]

10. Travel mode to work (region and county) [Place file]
11. Travel time to work (region and county) [Place file]
12. Household vehicles (region and county) [Household file]
13. Total reported household trips (region and county) [Household file]
14. 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	192	34.4%	65.6%	+/- 5.66%
9009	New Haven	136	50.0%	50.0%	+/- 7.07%
34003	Bergen	479	39.5%	60.5%	+/- 3.69%
34013	Essex	312	55.4%	44.6%	+/- 4.64%
34017	Hudson	354	62.4%	37.6%	+/- 4.25%
34019	Hunterdon	198	26.8%	73.2%	+/- 5.19%
34021	Mercer	313	40.6%	59.4%	+/- 4.58%
34023	Middlesex	294	46.6%	53.4%	+/- 4.80%
34025	Monmouth	319	42.9%	57.1%	+/- 4.57%
34027	Morris	223	28.7%	71.3%	+/- 5.00%
34029	Ocean	191	52.4%	47.6%	+/- 5.96%
34031	Passaic	207	57.5%	42.5%	+/- 5.67%
34035	Somerset	194	32.5%	67.5%	+/- 5.55%
34037	Sussex	214	37.9%	62.1%	+/- 5.47%
34039	Union	187	42.8%	57.2%	+/- 5.97%
34041	Warren	206	45.6%	54.4%	+/- 5.73%
36005	Bronx	215	77.2%	22.8%	+/- 4.72%
36027	Dutchess	211	45.0%	55.0%	+/- 5.65%
36047	Kings	378	69.6%	30.4%	+/- 3.90%
36059	Nassau	280	39.6%	60.4%	+/- 4.82%
36061	New York	1195	48.0%	52.0%	+/- 2.38%
36071	Orange	200	48.0%	52.0%	+/- 5.83%
36079	Putnam	182	40.1%	59.9%	+/- 5.99%
36081	Queens	217	65.4%	34.6%	+/- 5.33%
36085	Richmond	638	49.2%	50.8%	+/- 3.27%
36087	Rockland	173	38.2%	61.8%	+/- 6.10%
36103	Suffolk	324	37.7%	62.3%	+/- 4.44%
36119	Westchester	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	Confidence Interval 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	Confidence Interval Upper Bound
9001	Fairfield	270	2.41	1.645	0.0762	+/- 0.12	2.29	2.53
9009	New Haven	160	2.16	1.645	0.0912	+/- 0.15	2.01	2.31
34003	Bergen	643	2.45	1.645	0.0504	+/-0.09	2.36	2.53
34013	Essex	418	2.50	1.645	0.0699	+/-0.11	2.39	2.62
34017	Hudson	489	2.32	1.645	0.0598	+/-0.10	2.22	2.42
34019	Hunterdon	276	2.72	1.645	0.0758	+/-0.12	2.59	2.84
34021	Mercer	409	2.43	1.645	0.0627	+/-0.11	2.32	2.53
34023	Middlesex	376	2.50	1.645	0.0651	+/-0.11	2.39	2.61
34025	Monmouth	433	2.51	1.645	0.0662	+/-0.11	2.40	2.62
34027	Morris	288	2.62	1.645	0.0837	+/-0.14	2.48	2.76
34029	Ocean	269	2.39	1.645	0.0828	+/-0.13	2.26	2.53
34031	Passaic	275	2.44	1.645	0.0821	+/-0.14	2.30	2.57
34035	Somerset	266	2.48	1.645	0.0757	+/-0.12	2.36	2.61
34037	Sussex	277	2.71	1.645	0.0761	+/-0.12	2.59	2.84
34039	Union	260	2.51	1.645	0.0813	+/-0.14	2.38	2.65
34041	Warren	271	2.61	1.645	0.0764	+/-0.13	2.48	2.73
36005	Bronx	271	2.45	1.645	0.0850	+/-0.14	2.31	2.59
36027	Dutchess	275	2.57	1.645	0.0776	+/-0.13	2.44	2.70
36047	Kings	489	2.65	1.645	0.0682	+/-0.12	2.53	2.76
36059	Nassau	384	2.55	1.645	0.0703	+/-0.12	2.44	2.67
36061	New York	1548	1.80	1.645	0.0273	+/-0.05	1.75	1.84
36071	Orange	270	2.75	1.645	0.0867	+/-0.15	2.61	2.90
36079	Putnam	261	2.65	1.645	0.0842	+/-0.14	2.51	2.79
36081	Queens	276	2.49	1.645	0.0833	+/-0.14	2.35	2.63
36085	Richmond	813	2.55	1.645	0.0458	+/-0.08	2.48	2.63
36087	Rockland	250	2.76	1.645	0.0886	+/-0.15	2.61	2.90
36103	Suffolk	432	2.74	1.645	0.0663	+/-0.11	2.63	2.85
36119	Westchester	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	182	85.7%	14.3%	+/- 5.08%
9009	New Haven	112	95.5%	4.5%	+/- 3.82%
34003	Bergen	511	80.8%	19.2%	+/- 3.41%
34013	Essex	291	75.6%	24.4%	+/- 4.93%
34017	Hudson	295	54.9%	45.1%	+/- 5.68%
34019	Hunterdon	230	91.7%	8.3%	+/- 3.56%
34021	Mercer	305	89.2%	10.8%	+/- 3.49%
34023	Middlesex	330	86.7%	13.3%	+/- 3.67%
34025	Monmouth	321	86.6%	13.4%	+/- 3.73%
34027	Morris	295	91.5%	8.5%	+/- 3.18%
34029	Ocean	171	92.4%	7.6%	+/- 3.97%
34031	Passaic	185	88.6%	11.4%	+/- 4.57%
34035	Somerset	193	95.3%	4.7%	+/- 2.97%
34037	Sussex	217	98.6%	1.4%	+/- 1.55%
34039	Union	207	82.6%	17.4%	+/- 5.16%
34041	Warren	255	98.8%	1.2%	+/- 1.32%
36005	Bronx	191	35.6%	64.4%	+/- 6.79%
36027	Dutchess	217	92.2%	7.8%	+/- 3.58%
36047	Kings	395	30.1%	69.9%	+/- 4.52%
36059	Nassau	352	74.1%	25.9%	+/- 4.57%
36061	New York	1068	7.8%	92.2%	+/- 1.61%
36071	Orange	228	86.8%	13.2%	+/- 4.39%
36079	Putnam	178	85.4%	14.6%	+/- 5.19%
36081	Queens	235	41.3%	58.7%	+/- 6.29%
36085	Richmond	581	62.5%	37.5%	+/- 3.94%
36087	Rockland	219	88.1%	11.9%	+/- 4.28%
36103	Suffolk	446	90.8%	9.2%	+/- 2.68%
36119	Westchester	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	Confidence Interval 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	Confidence Interval Upper Bound
9001	Fairfield	183	23.88	1.645	1.79	+/- 2.94	20.93	26.84
9009	New Haven	112	20.88	1.645	1.96	+/- 3.22	17.63	24.14
34003	Bergen	514	25.79	1.645	0.98	+/- 1.61	24.18	27.40
34013	Essex	293	30.43	1.645	3.13	+/- 5.15	25.26	35.60
34017	Hudson	302	30.60	1.645	1.67	+/- 2.75	27.85	33.35
34019	Hunterdon	230	30.51	1.645	2.58	+/- 4.24	26.25	34.78
34021	Mercer	310	25.09	1.645	1.39	+/- 2.29	22.80	27.37
34023	Middlesex	337	28.66	1.645	1.53	+/- 2.52	26.14	31.18
34025	Monmouth	328	32.38	1.645	1.89	+/- 3.11	29.26	35.49
34027	Morris	296	27.81	1.645	1.64	+/- 2.70	25.11	30.52
34029	Ocean	174	29.46	1.645	2.42	+/- 3.98	25.45	33.46
34031	Passaic	187	26.99	1.645	1.62	+/- 2.66	24.32	29.66
34035	Somerset	195	24.02	1.645	1.36	+/- 2.24	21.77	26.26
34037	Sussex	220	31.04	1.645	2.26	+/- 3.72	27.30	34.77
34039	Union	212	31.13	1.645	4.05	+/- 6.66	24.43	37.82
34041	Warren	262	33.24	1.645	2.22	+/- 3.65	29.57	36.90
36005	Bronx	197	40.45	1.645	2.06	+/- 3.39	37.05	43.85
36027	Dutchess	220	24.44	1.645	1.83	+/- 3.01	21.42	27.46
36047	Kings	405	41.74	1.645	1.49	+/- 2.45	39.27	44.20
36059	Nassau	358	34.94	1.645	2.40	+/- 3.95	30.97	38.90
36061	New York	1078	27.38	1.645	0.94	+/- 1.55	25.84	28.92
36071	Orange	230	28.14	1.645	2.05	+/- 3.37	24.76	31.52
36079	Putnam	181	38.71	1.645	2.82	+/- 4.64	34.05	43.38
36081	Queens	237	38.59	1.645	2.07	+/- 3.41	35.18	42.00
36085	Richmond	595	37.07	1.645	1.25	+/- 2.06	35.01	39.14
36087	Rockland	223	30.74	1.645	2.39	+/- 3.93	26.80	34.69
36103	Suffolk	457	28.41	1.645	1.34	+/- 2.20	26.21	30.62
36119	Westchester	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	Confidence Interval 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	Confidence Interval Upper Bound
9001	Fairfield	270	2.04	1.645	0.0706	+/- 0.12	1.92	2.15
9009	New Haven	160	1.78	1.645	0.0735	+/- 0.12	1.66	1.90
34003	Bergen	643	1.83	1.645	0.0445	+/- 0.07	1.75	1.90
34013	Essex	418	1.44	1.645	0.0536	+/- 0.08	1.35	1.53
34017	Hudson	489	1.15	1.645	0.0440	+/- 0.07	1.08	1.22
34019	Hunterdon	276	2.41	1.645	0.0678	+/- 0.12	2.30	2.52
34021	Mercer	409	1.86	1.645	0.0531	+/- 0.08	1.77	1.95
34023	Middlesex	376	1.86	1.645	0.0544	+/- 0.08	1.77	1.95
34025	Monmouth	433	1.91	1.645	0.0526	+/- 0.08	1.82	1.99
34027	Morris	288	2.11	1.645	0.0643	+/- 0.10	2.00	2.21
34029	Ocean	269	1.89	1.645	0.0815	+/- 0.13	1.75	2.02
34031	Passaic	275	1.73	1.645	0.0606	+/- 0.10	1.63	1.83
34035	Somerset	266	2.03	1.645	0.0656	+/- 0.12	1.92	2.14
34037	Sussex	277	2.26	1.645	0.0725	+/- 0.12	2.14	2.38
34039	Union	260	1.90	1.645	0.0691	+/- 0.12	1.79	2.01
34041	Warren	271	2.08	1.645	0.0673	+/- 0.12	1.97	2.19
36005	Bronx	271	0.70	1.645	0.0549	+/- 0.08	0.61	0.79
36027	Dutchess	275	2.08	1.645	0.0752	+/- 0.13	1.96	2.20
36047	Kings	489	0.75	1.645	0.0387	+/- 0.07	0.68	0.81
36059	Nassau	384	1.90	1.645	0.0530	+/- 0.08	1.81	1.99
36061	New York	1548	0.38	1.645	0.0168	+/- 0.03	0.35	0.41
36071	Orange	270	2.03	1.645	0.0726	+/- 0.12	1.91	2.15
36079	Putnam	261	2.21	1.645	0.0762	+/- 0.13	2.09	2.34
36081	Queens	276	1.03	1.645	0.0539	+/- 0.08	0.94	1.11
36085	Richmond	813	1.47	1.645	0.0346	+/- 0.05	1.41	1.53
36087	Rockland	250	2.07	1.645	0.0751	+/- 0.13	1.95	2.20
36103	Suffolk	432	2.07	1.645	0.0520	+/- 0.08	1.99	2.16
36119	Westchester	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	Confidence Interval 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	Confidence Interval Upper Bound
9001	Fairfield	270	8.53	1.645	0.40	+/- 0.66	7.87	9.20
9009	New Haven	160	7.40	1.645	0.52	+/- 0.86	6.54	8.26
34003	Bergen	643	8.72	1.645	0.30	+/- 0.49	8.22	9.21
34013	Essex	418	7.46	1.645	0.33	+/- 0.54	6.92	8.01
34017	Hudson	489	6.62	1.645	0.27	+/- 0.44	6.18	7.06
34019	Hunterdon	276	9.07	1.645	0.43	+/- 0.71	8.36	9.77
34021	Mercer	409	8.65	1.645	0.37	+/- 0.61	8.04	9.25
34023	Middlesex	376	8.36	1.645	0.35	+/- 0.58	7.78	8.94
34025	Monmouth	433	9.18	1.645	0.36	+/- 0.59	8.58	9.77
34027	Morris	288	9.44	1.645	0.48	+/- 0.79	8.66	10.23
34029	Ocean	269	7.14	1.645	0.41	+/- 0.67	6.47	7.82
34031	Passaic	275	7.85	1.645	0.45	+/- 0.74	7.12	8.59
34035	Somerset	266	9.00	1.645	0.46	+/- 0.76	8.25	9.76
34037	Sussex	277	9.35	1.645	0.44	+/- 0.72	8.63	10.08
34039	Union	260	8.98	1.645	0.46	+/- 0.76	8.23	9.73
34041	Warren	271	8.65	1.645	0.47	+/- 0.77	7.88	9.43
36005	Bronx	271	6.66	1.645	0.36	+/- 0.59	6.07	7.26
36027	Dutchess	275	9.28	1.645	0.44	+/- 0.72	8.56	10.01
36047	Kings	489	7.07	1.645	0.28	+/- 0.46	6.60	7.53
36059	Nassau	384	8.86	1.645	0.36	+/- 0.59	8.27	9.45
36061	New York	1548	6.19	1.645	0.13	+/- 0.21	5.98	6.40
36071	Orange	270	9.66	1.645	0.50	+/- 0.82	8.83	10.49
36079	Putnam	261	9.30	1.645	0.50	+/- 0.82	8.47	10.12
36081	Queens	276	7.25	1.645	0.40	+/- 0.66	6.59	7.92
36085	Richmond	813	7.83	1.645	0.24	+/- 0.39	7.43	8.22
36087	Rockland	250	9.20	1.645	0.45	+/- 0.74	8.47	9.94
36103	Suffolk	432	9.64	1.645	0.37	+/- 0.61	9.02	10.25
36119	Westchester	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	183	10.9%	89.1%	+/- 4.52%
9009	New Haven	112	1.8%	98.2%	+/- 2.45%
34003	Bergen	514	18.7%	81.3%	+/- 3.37%
34013	Essex	293	9.2%	90.8%	+/- 3.31%
34017	Hudson	302	24.5%	75.5%	+/- 4.85%
34019	Hunterdon	230	2.6%	97.4%	+/- 2.06%
34021	Mercer	310	4.2%	95.8%	+/- 2.23%
34023	Middlesex	337	8.0%	92.0%	+/- 2.90%
34025	Monmouth	328	12.5%	87.5%	+/- 3.58%
34027	Morris	296	4.4%	95.6%	+/- 2.33%
34029	Ocean	174	57.5%	42.5%	+/- 7.35%
34031	Passaic	187	7.0%	93.0%	+/- 3.65%
34035	Somerset	195	51.3%	48.7%	+/- 7.02%
34037	Sussex	220	45.5%	54.5%	+/- 6.58%
34039	Union	212	11.8%	88.2%	+/- 4.34%
34041	Warren	262	1.5%	98.5%	+/- 1.48%
36005	Bronx	197	42.6%	57.4%	+/- 6.91%
36027	Dutchess	220	1.8%	98.2%	+/- 1.77%
36047	Kings	405	47.4%	52.6%	+/- 4.86%
36059	Nassau	358	22.9%	77.1%	+/- 4.35%
36061	New York	1078	85.3%	14.7%	+/- 2.11%
36071	Orange	230	7.0%	93.0%	+/- 3.29%
36079	Putnam	181	8.3%	91.7%	+/- 4.02%
36081	Queens	237	51.5%	48.5%	+/- 6.36%
36085	Richmond	595	30.1%	69.9%	+/- 3.69%
36087	Rockland	223	11.7%	88.3%	+/- 4.21%
36103	Suffolk	457	6.8%	93.2%	+/- 2.31%
36119	Westchester	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 F

Disposition of Final *RT-HIS* Data

Appendix F: Disposition of Final RT-HIS Data

1. Regional Travel Household Interview Survey (RT-HIS)

Final *RT-HIS* data were delivered on September 2, 1999, with data for 11,264 households interviewed throughout the course of the *RT-HIS* (2,133 households from Spring 1997; 4,994 from Fall 1997; and 4,137 from Spring 1998). The data for 11,263 of these households is “complete” according to the standards established in MOU #4; that is, there is only one “invalid partial” survey being submitted with this preliminary 100% RT-HIS data transmittal. Furthermore, this data set is a culmination of all of the project team efforts to produce high quality survey data which meets the sampling objectives as well as the Stage 3 quality standards of the project.

2. Sampling Plan Compliance

The *RT-HIS* had several sampling objectives, including county and mode density leadership (MDL) requirements, regional targets, weekend sample goals, and even distribution of weekday samples. As the tables in this memorandum display, NuStats has successfully achieved the RT-HIS sampling goals. Table 1 displays the county distribution of the *RT-HIS* sample. Overall, the county distribution is quite good; the total retrieved households are within 5% of the project goals. Similarly, the DMDL sample distribution is reasonably close to the objectives, as shown in Table 2. Table 3 displays the distribution of households by region and sample type (i.e. weekday or weekend). Again, the sampling requirements were achieved with respect to the number of households surveyed in each region. Additionally, the goal of obtaining 252 New Jersey weekend surveys was exceeded by 41 households. Table 4 shows the county distribution of the weekend surveys which were collected; as specified in the sample plan, almost all of the weekend surveys were collected for New Jersey households. Finally, as shown in Table 5, the efforts made to achieve a relatively uniform day-of-week distribution for weekday samples were successful – approximately 20% for each weekday.

Table 1: County Distribution

County	State	FIPSCODE	Goals	Total Households	% Difference
Fairfield	CT	9001	271	270	-0.4%
New Haven	CT	9009	166	160	-3.6%
Bergen	NJ	34003	694	689	-0.7%
Essex	NJ	34013	465	452	-2.8%
Hudson	NJ	34017	519	511	-1.5%
Hunterdon	NJ	34019	275	287	4.4%
Mercer	NJ	34021	394	420	6.6%
Middlesex	NJ	34023	378	400	5.8%
Monmouth	NJ	34025	427	451	5.6%
Morris	NJ	34027	288	301	4.5%
Ocean	NJ	34029	291	303	4.1%
Passaic	NJ	34031	290	289	-0.3%
Somerset	NJ	34035	282	276	-2.1%
Sussex	NJ	34037	276	290	5.1%
Union	NJ	34039	293	279	-4.8%
Warren	NJ	34041	276	288	4.3%
Bronx	NY	36005	271	271	0.0%
Dutchess	NY	36027	271	275	1.5%
Kings	NY	36047	483	489	1.2%
Nassau	NY	36059	400	384	-4.0%
New York	NY	36061	1504	1548	2.9%
Orange	NY	36071	271	270	-0.4%
Putnam	NY	36079	271	263	-3.0%
Queens	NY	36081	273	276	1.1%
Richmond	NY	36085	807	813	0.7%
Rockland	NY	36087	271	252	-7.0%
Suffolk	NY	36103	434	433	-0.2%
Westchester	NY	36119	340	324	-4.7%
Total			11181	11264	0.7%

Table 2: Density / Mode Leadership District (DMDL) Distribution

MDL Code	Goals	Total Households	% Difference
1	1199	1167	-2.7%
2	148	142	-4.1%
3	925	1003	8.4%
11	484	495	2.3%
12	342	326	-4.7%
13	293	296	1.0%
14	886	886	0.0%
15	322	343	6.5%
16	424	412	-2.8%
21	335	340	1.5%
22	474	449	-5.3%
23	311	301	-3.2%
24	568	564	-0.7%
31	441	450	2.0%
32	737	740	0.4%
33	360	437	21.4%
35	1036	963	-7.0%
98	1644	1657	0.8%
Weekend	252	293	16.3%
Total	11181	11264	0.7%

Table 3: Regional Distribution by Sample Type (weekday or weekend)

Region	Sample Type		Total
	Weekday	Weekend	
Connecticut	430	—	430
New York	5591	7	5598
New Jersey (not Mercer)	4541	275	4816
Mercer County	409	11	420
Total	10971	293	11264

Table 4: County Distribution of Weekend Sample

County	State	FIPSCOD E	Households	Percentage
Bergen	NJ	34003	46	15.7%
Essex	NJ	34013	34	11.6%
Hudson	NJ	34017	22	7.5%
Hunterdon	NJ	34019	11	3.8%
Mercer	NJ	34021	11	3.8%
Middlesex	NJ	34023	24	8.2%
Monmouth	NJ	34025	18	6.1%
Morris	NJ	34027	13	4.4%
Ocean	NJ	34029	34	11.6%
Passaic	NJ	34031	14	4.8%
Somerset	NJ	34035	10	3.4%
Sussex	NJ	34037	13	4.4%
Union	NJ	34039	19	6.5%
Warren	NJ	34041	17	5.8%
Other: NY	NY		7	2.4%
Total			293	100.0%

Table 5: Day of Week Distribution

Day of Week	Households	Percentage
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	11264	100.0%

3. Data Quality

The data meet the agreed upon quality standards established for the *RT-HIS* project. The NYMTC/NJTPA HIS data has been subjected to numerous rigorous data quality checks during the course of the data collection/cleaning period. Since completion of all data collection activities in the Spring of 1998, a structured and intensive a data quality review and cleaning process has been pursued, resulting in this final data set. In an effort to ensure that users of the data are sufficiently informed all aspects of data quality, the data records carry Quality Flags, the meaning of which, and the data processing history for these records, fully described in the HIS User’s Manual. The data have audit trails (contained in AUDIT.SAV) which specifically indicate the data cleaning steps that have been applied. With this information, HIS data users, including the PB project team, can fully exploit the HIS data for analysis and model development by appropriate filtering of the data to be used according to documented levels of confidence in specific data measures.

3. Geocoding Rates

The geocoding rates for the Final HIS data have been substantially improved over preliminary data submittals due to extensive post-data collection research and processing. The established goals for geocoding rates are 100% for Home addresses, 97% for Work 1, 88% for remaining Habitual addresses, and 88% for all other locations. Table 6 below displays the geocoding rates for each habitual address; that is, home, work1, work2, and school location for each respondent (PER file). These rates are based on all home, work, and school locations, regardless of whether the respondent went there on his/her travel day. Table 7 illustrates that we have geocoding data for each habitual address within the study area and visited on the travel day. When locations that are out of the area or were not visited are excluded from the accounting, the habitual addresses were successfully geocoded 100%.

Table 6: Geocoding Data for Habitual Places – Location File

	Home	Work 1	Work 2	School	Total Habitual Locations
Geocoded: Matched (M)	11,264 100%	12271 86.5%	350 43.5%	5738 88.0%	29,623 90.4%
Geocoded: Imputed (I)		823 5.8%	1 0.1%	514 7.9%	1338 4.1%
Out of Area		197 1.4%	33 4.1%	162 2.5%	392 1.2%
Not Visited		902 6.4%	420 52.2%	104 1.6%	1426 0.9%
Total	11,264	14,193	804	6,518	32,779

Table 7 displays the geocoding rates of all locations in the place/trip file (PLAC); the table displays the distribution based on place type and geocoding quality (i.e. matched, imputed, out of area). Again, for each location within the study area, the data display an appropriate longitude/latitude coordinate.

Table 7: Geocoding Data for Habitual Places - Place File

	Home	Habitual	Other	Total Places
Geocoded: Matched (M)	58,995 100%	10,829 94.6%	42,732 89.6%	112,556 95.3%
Geocoded: Imputed (I)		544 4.7%	3,848 8.1%	4,392 3.7%
Out of Area		84 0.7%	1098 2.3%	1,182 1.0%
Total	58,995	11,457	47,680	118,132

Given that we have longitude/latitude coordinates for each location which is in the study area and was visited on the travel day, the final HIS data meet the required geocoding standards.