New York Metropolitan Transportation Council

North Jersey Transportation Planning Authority

2010/2011 Regional Household Travel Survey

Executive Summary

Final Report

Regional Travel Survey

For a better transportation future.

October 2014

Disclaimer

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The project team consisted of:

Consultant Team:

- Jesse Casas, NuStats
- Mia Zmud, NuStats
- Lucia Lanini, NuStats
- Kim Hilsenbeck, NuStats
- Jean Wolf, GeoStats
- Jeremy Wilhelm, GeoStats
- Marcelo Oliveria, GeoStats
- Bob Donnelly, Parsons Brinkerhoff

NYMTC Staff:

- Jorge Argote, P.E., Project Manager
- Kyeongsu Kim, Data Quality Analyst

NJTPA Staff:

- Bob Diogo, Project Manager

Technical Advisory Committee:

- Elaine Murakami, Federal Highway Administration
- Guy Rousseau, Atlanta Regional Commission
- Nancy McGuckin, Travel Behavior Consultant
- Arnim Meyburg, Cornell University
- Neil Kilgren, Puget Sound Regional Council

Steering Committee:

- NYMTC Voting Members**:** Counties of Nassau, Putnam, Rockland, Suffolk and Westchester; Metropolitan Transportation Authority (MTA); New York City Department of City Planning (NYCDCP); New York City Department of Transportation (NYCDOT); New York State Department of Transportation (NYSDOT)
- NYMTC Advisory Members**:** New Jersey Transit (NJT);North Jersey Transportation Planning Authority (NJTPA); Port Authority of New York & New Jersey (PANY&NJ)
- Adjacent MPOs: South Western Regional Planning Agency (SWRPA); Greater Bridgeport Regional Council (GBRC); Valley Council Of Governments (VCOG); Orange County Transportation Council (OCTC); Poughkeepsie-Dutchess County Transportation Council (PDCTC); Delaware Valley Regional Planning Commission (DVRPC);
- Other Government Agencies: New York City Department of Health & Mental Hygiene

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Glossary of Terms and Report Acronyms

ACS - American Community Survey (US Census)

CASI - Computer Assisted Self Interviewing (Web)

CATI - Computer Assisted Telephone Interviewing

CDF - Continuous Data Flow

DBE - Disadvantaged Business Enterprise

DSF - United States Postal Service's Delivery Sequence File

FAQ - Frequently Asked Questions

GPS - Global Positioning System

HOV - High Occupancy Vehicle

MDB - Multi-Dimensional Balancing (weighting Stage 2)

MPH – Miles per Hour

MPO – Metropolitan Planning Organization

MSG - Marketing Systems Group

MTA - Metropolitan Transportation Authority

NHTS - National Household Travel Survey

NJRTME – North Jersey Regional Transportation Model - Enhanced

NJTPA – North Jersey Transportation Planning Authority

NMEA – National Marine Electronics Association

NYBPM – New York Best Practices Model

NYMTC – New York Metropolitan Transportation Council

PB - Parsons Brinckerhoff

PIO - Public Information Officer

PR - Prompted Recall

PUMA - ACS' Public Use Microdata Area (geographic)

PUMS - ACS' Public Use Microdata Sample

RHTS – 2010/2011 Regional Household Travel Survey

RTFM - Regional Transit Forecasting Model

RT-HIS – 1997/1998 Regional Travel Household Interview Survey

SPSS – Statistical Package for Social Scientists (an IBM Statistical Software Package chosen as the primary analytical tool for this project)

TAZ - Transportation Analysis Zone

TBW – Trip Builder Web

1.0 Executive Summary

1.1 THE REGIONAL HOUSEHOLD TRAVEL SURVEY: OVERVIEW

The New York Metropolitan Transportation Council (NYMTC) and the North Jersey Transportation Planning Authority (NJTPA) jointly sponsored the 2010/2011 Regional Household Travel Survey (RHTS), a comprehensive survey of the travel behavior characteristics and related demographics of residents within 28 counties of the New York-New Jersey-Connecticut metropolitan area. The survey area included: the five boroughs of New York City (NYC) –Manhattan, Queens, Bronx, Brooklyn (Kings), and Staten Island (Richmond); Nassau and Suffolk counties on Long Island; five Hudson Valley counties – Westchester, Dutchess, Putnam, Rockland and Orange; 14 counties in New Jersey – Bergen, Passaic, Hudson, Essex, Union, Morris, Somerset, Middlesex, Monmouth, Ocean, Hunterdon, Warren, Sussex, and Mercer; and Fairfield and New Haven counties in Connecticut.

NYMTC is a regional council of governments that is the metropolitan planning organization for New York City, Long Island and the lower Hudson Valley, providing a collaborative planning forum to address transportation-related issues, develop regional plans and make decisions on the use of federal transportation funds. NJTPA is the metropolitan planning organization for the 13-county northern New Jersey region, overseeing over $2 billion in transportation improvement projects and providing a forum for interagency cooperation and public input.

The data, gathered though the survey provides information on travel and mobility patterns, enables updates to state and regional travel demand models and ultimately assists transportation professionals and decision makers in better understanding the needs of the traveling public. The previous Regional Travel Household Interview Survey (RT-HIS), which collected similar data, was performed in 1997/1998.

Through the RHTS, demographic and trip data were collected from 18,965 households, including a sub–sample of 1,930 households whose members also provided travel data using wearable global positioning system (GPS) devices. The sample was designed to account for the large number of households in the region and the unique diversity of its demographics, transportation systems and travel behavior. Households were recruited by either computer-assisted telephone interviewing (CATI) or mail, and their travel information was retrieved by CATI, mail or using the software program TripBuilder™ through the project website. To increase participation, the survey was available in English, Spanish, Russian and Chinese, which are the four predominantly-spoken languages in the region. Travel data were collected for a 24-hour weekday period between September 2010 and November 2011, and households were provided diaries to assist in recording travel. This was the first large–scale travel survey ever conducted to use this approach for a GPS subsample and proved to be a successful method in one of the most challenging GPS environments in the United States. The online GPS–based prompted recall method used also proved to bring some hard–to–reach socio–demographic groups into the RHTS who may otherwise not have participated.

To support comparisons, the survey was largely designed for consistency with the one conducted in 1997/1998, aiming to capture overall travel patterns in the region. However, substantial enhancements were also made, such as including the GPS subsample which improved accounting for short, non-work walk trips. Due to such methodological differences, caution must be taken when comparing results across the two surveys

This report presents the weighted linked trip findings. A linked trip is travel between an origin and a destination defined by a primary activity that may or may not include mode transfers or stops. The weighting includes the application of trip correction factors based on a comparison of the diary and GPS trips. The final data set includes the unweighted data as well as weight variables.

Unless otherwise noted, the primary mode of transportation, determined based on a mode hierarchy (as detailed in section 4.1 of the report), was used for trips using multiple modes. For example, for a trip to work which includes walking to a train station, taking the train to a station close to office, then walking to the office, uses two modes (rail and walk). Rail would be the primary mode since it is higher on the mode hierarchy than walking.

KEY FINDINGS:

- The approximately 22 million residents in the New York-New Jersey-Connecticut travel survey study area made approximately 80 million individual trips on an average weekday.
- Household trip rates increased with household income, the presence of children in the household and household size
- Slightly more than 82% of all trips in the study area were intra-county, an increase from 78% in the 1997/1998 survey.
- Nearly 67% of all trips in the study area were made by automobile, followed by non-motorized trips (18%), defined as trips made by walking and bicycle.
- Manhattan, the other boroughs of New York City, and Hudson County New Jersey had the highest percentages of non-motorized trips within their physical areas (56%, 32% and 31%, respectively).
- Lower income populations (making less than $30,000 annually) are more likely to use bus services (10%), or walk/bike (24%) as the main mode for their trips than those of higher income.
- Public transit serves 8% of all weekday trips in the region.
- Approximately 67 percent of all intra-county trips and 95 percent of all inter-county trips in the region were made by automobile, while 66 percent of travel to Manhattan was made by rail.
- Over 80% of commute trips into Manhattan use some form of public transit.
- 54% of all trips are between home and destinations other than work (e.g., social/recreation, shopping, school, etc.); 23% of trips involve the workplace.
- Work trips in the region normally took between 32 and 35 minutes, with work trips from Manhattan averaging 30 minutes, while work trips from the other NYC boroughs averaged 42 minutes (the high in the region).

Who is traveling?

- ***THE APPROXIMATELY 22 MILLION RESIDENTS IN THE NEW YORK-NEW JERSEY-CONNECTICUT TRAVEL SURVEY STUDY AREA MAKE APPROXIMATELY 80 MILLION INDIVIDUAL TRIPS ON AN AVERAGE WEEKDAY.***

For each sampled weekday, participating households averaged slightly more than 10 trips, and household members averaged four trips each. By comparison, the 1997/1998 RT-HIS showed trip rates of more than eight trips per household and slightly more than three per person; however, the increase in reported trip rates is mainly due to the improved accounting of trips (mostly short distance walk trips) by GPS correction factor. The unadjusted trip rates from 2010/2011 survey are very similar to that of 1997/1998 (Table 1-1).

Table 1-1: Households and Person Trip Rates: Comparison between 1997/1998 Survey and 2010/2011 Survey

	1997/1998 Survey*	2010/2011 Survey
Trip Rates per Household	8.3	10.1 (8.1**)
Trip Rates per Person	3.2	4.0 (3.2**)

Note: * the estimates are based on the updated compendium of results reweighted with Census 2000 figures (Feb 2005)
** Unadjusted with GPS correction factor

- ***HOUSEHOLD TRIP RATES INCREASED WITH HOUSEHOLD INCOME, THE PRESENCE OF CHILDREN IN THE HOUSEHOLD AND HOUSEHOLD SIZE.***

Among all trips made by household members, women had higher trip rates than men (table 1-5). Also, persons 35-54 years of age (closely followed by the 55-64 age group) had higher trip rates than the other age groups.

Table 1-2: Household Trip Rates by Household Income

	Below $30k	$30k-$74.9k	$75k-$99.9k	$100+	Did not Provide	Overall Mean
Household Trips per Day	7.5	9.5	11.5	12.9	8.4	10.1

Table 1-3: Household Trip Rates by Household Structure

	2+ Workers with Child(s)	2+ Workers no Children	1 Worker with Child(s)	1 Worker no Children	No Workers with Child(s)	No Workers no Children	Overall Mean Trip Rate
Household Trips per Day	16.7	10.2	15.6	6.4	12.5	5.8	10.1

Table 1-4: Household Trip Rates by Household Size

	1	2	3	4+	Overall Mean Trip Rate
Household Trips per Day	4.8	8.2	11.4	17.1	10.1

Table 1-5: Person Trip Rates by Gender and Trip Type

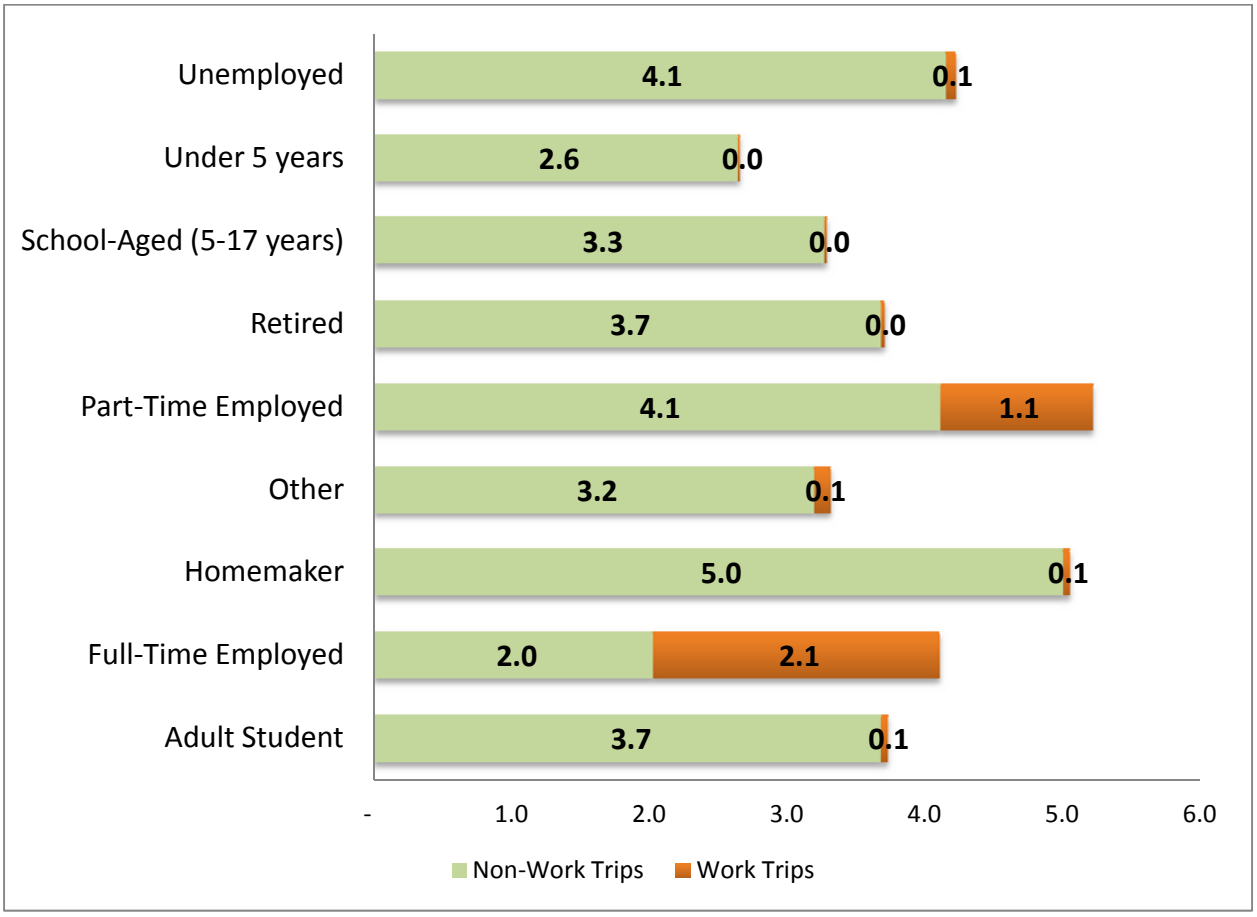
Gender	Trip Types		
	Work	Non-Work	Total
Male	1.0	2.7	**3.8**
Female	0.9	3.3	**4.2**
Did not Provide	0.2	2.0	**2.2**
Overall	1.0	3.1	**4.0**

Table 1-6: Person Trip Rates by Age Group and Trip Type

Age Group	Work Trips	Non-Work Trips	Total
Younger than 16 years	0.0	3.1	3.1
16-18 years	0.1	3.4	3.5
19-24 years	0.9	2.4	3.3
25-34 years	1.5	2.5	4.0
35-54 years	1.6	3.2	4.7
55-64 years	1.3	3.3	4.6
65 years or older	0.4	3.3	3.7
Age not Provided	0.9	3.0	3.9
Total	1.0	3.1	4.0

The highest trip rates are made by the part-time employed. Homemakers make the most non-work trips followed by unemployed and part-time employed people.

Figure 1–1: Person Trip Rates by Lifecycle Status



Where are we traveling?

- ***SLIGHTLY MORE THAN 82% OF ALL TRIPS IN THE STUDY AREA WERE INTRA-COUNTY, AN INCREASE FROM 78% IN THE 1997/1998 SURVEY.***

Both work and non-work trip patterns are similar between the 1997/1998 survey and the 2010/2011 survey (figures 1-2 and 1-3). A large majority of all trips in the study area were within the same county (82%), an increase from 78% in the 1997/1998 RT-HIS. Fewer work trips (63%) were within the same county, compared to 88% of non-work trips (in 1997/1998, 62% of work trips were within the same county and 84% of non-work trips).

Figure 1–2: Origin-Destination Patterns in Region (Work Trips)

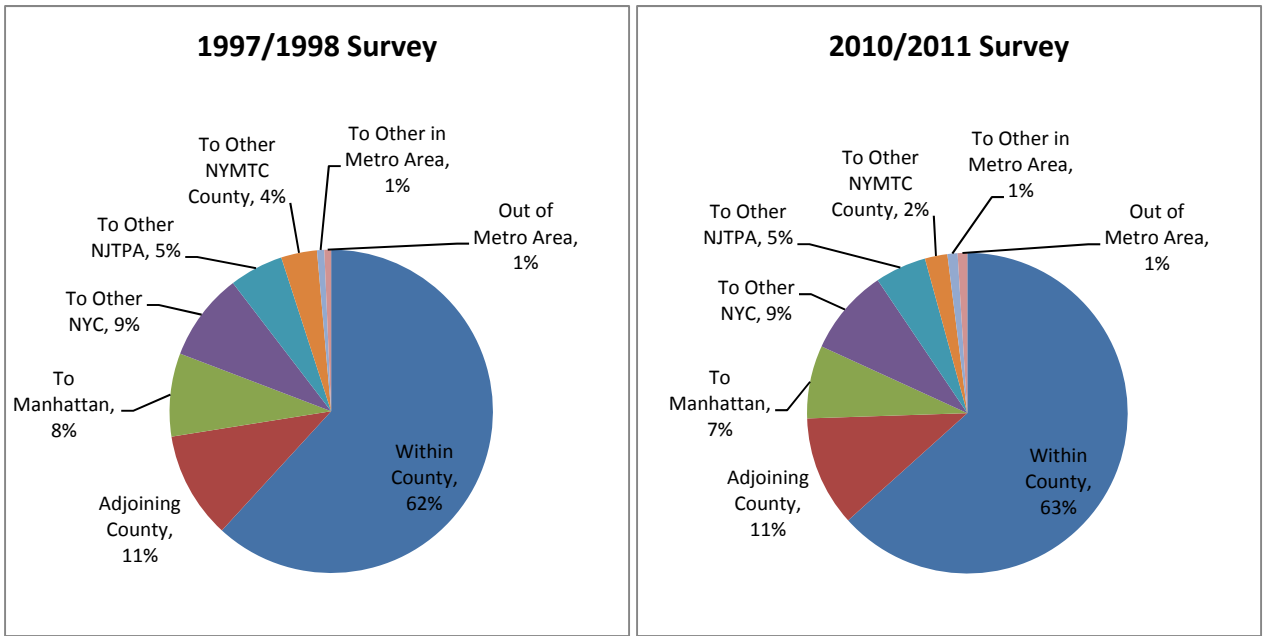
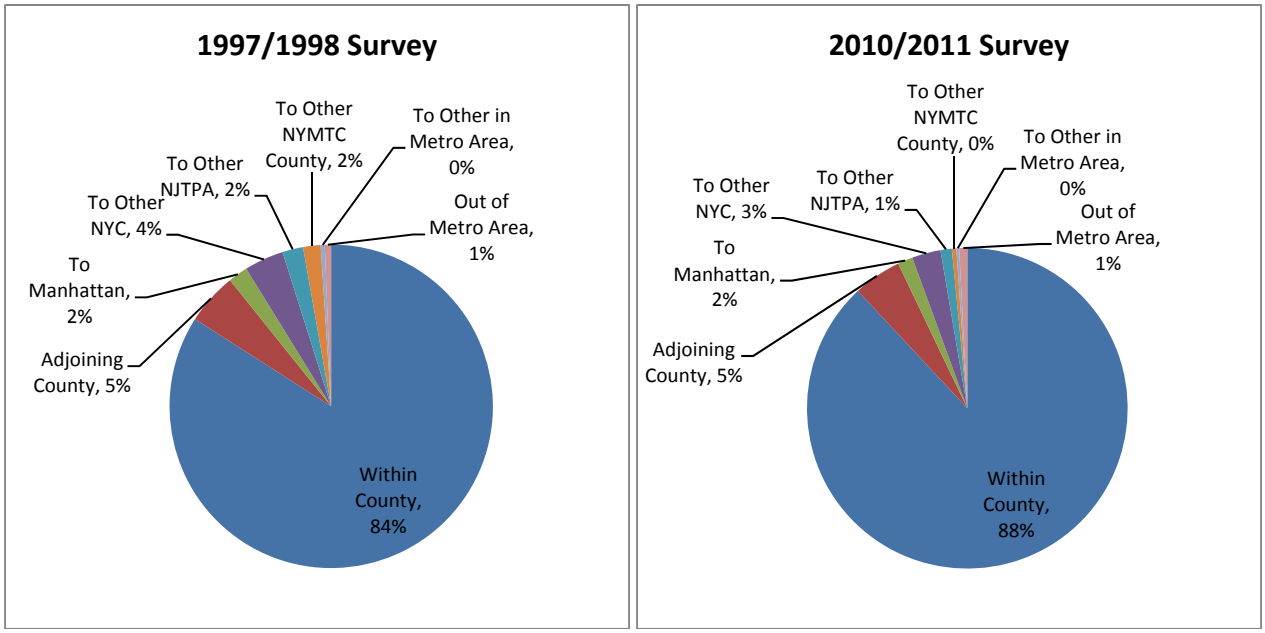


Figure 1–3: Origin-Destination Patterns in Region (Non-Work Trips)

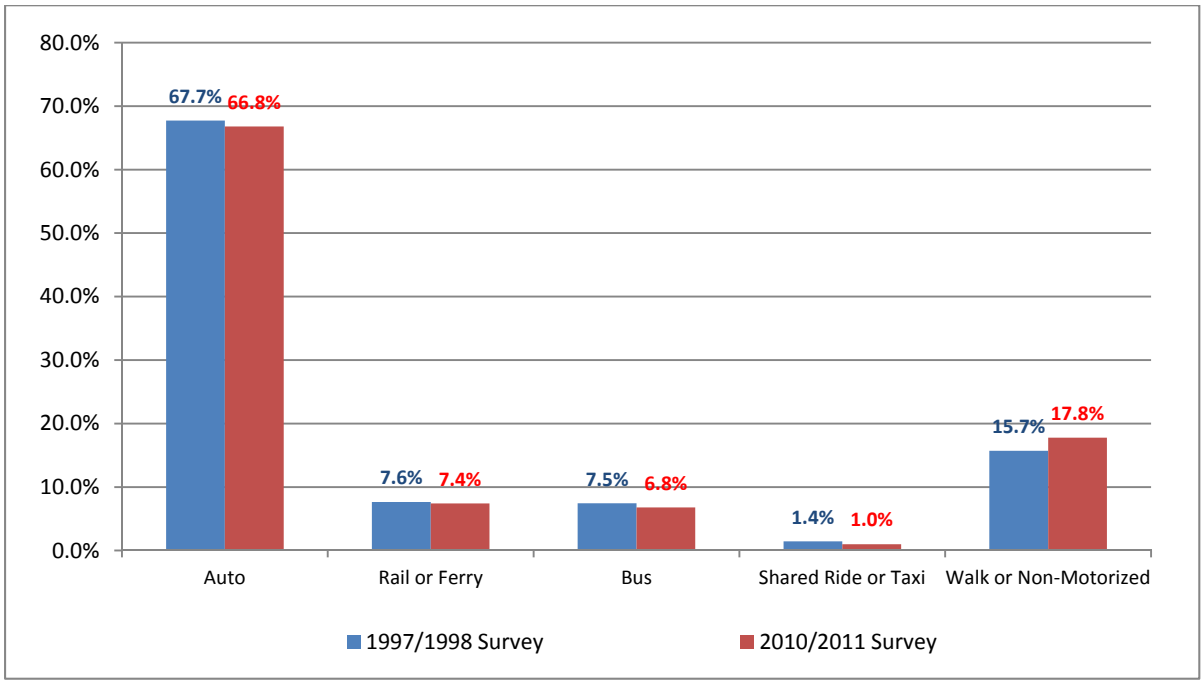


How we travel:

- ***Nearly 67% of all trips in the study area were made by automobile, followed by non-motorized trips (18%), defined as trips made by walking and bicycle.***
- ***Manhattan, the other boroughs of New York City, and Hudson County New Jersey had the highest percentages of non-motorized trips within their physical areas (56%, 32% and 31%, respectively).***
- ***Lower income populations (making less than $30,000 annually) are more likely to use bus services (10%), or walk/bike (24%) as the main mode for their trips than those of higher income.***
- ***Public transit serves 8% of all weekday trips in the region.***

The choice in mode of travel has not changed greatly from the 1997/1998 survey. The majority of all trips in the study area were made by automobile (67%), although there are fewer auto passenger trips than in 1997/1998. Travelers make slightly more walk trips in the 2010/2011 survey; however, this might be due to better accounting of these trips. As expected, Manhattan, the other New York City boroughs and the urbanized areas of Hudson County in New Jersey had the highest percentages of non-motorized trips within their physical boundaries (56%, 32% and 31%, respectively). Except for Brooklyn, Queens, Manhattan and the Bronx, Hudson County is the only county in the study area with an auto mode share less than 70% (with 47% of trips by auto), a non-motorized mode share greater than 25% (with 31% of trips using non-motorized means) or a rail/ferry mode share greater than 5% (with 11% of trips via rail/ferry).

Figure 1–4: Primary Mode used for All Trips



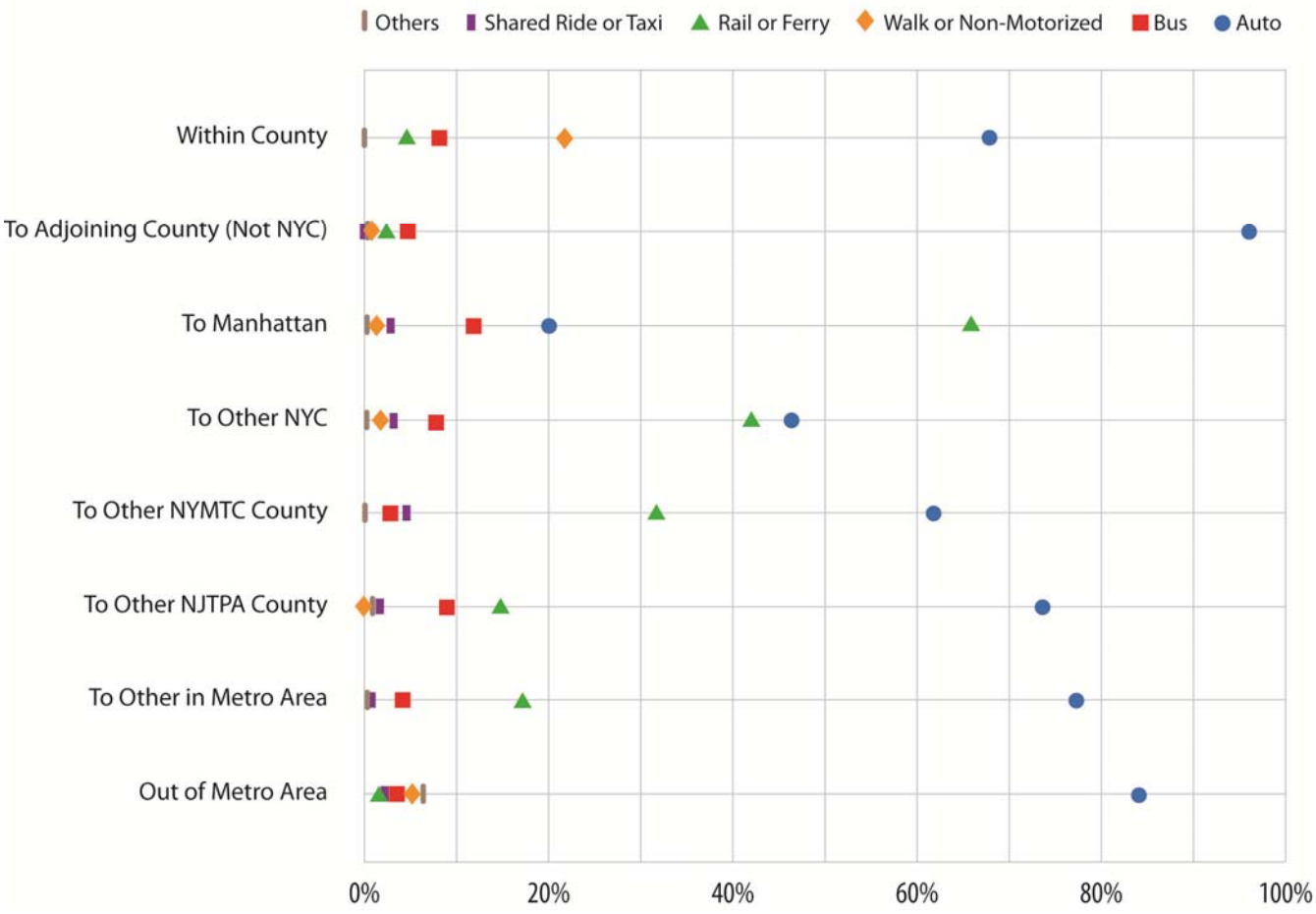
The purpose of the trip impacts the mode of travel used. Rail is a popular mode for work purposes, while walking is a more popular travel mode for non-work purposes such as shopping and social/recreation trips. The popularity of the bus mode for school trips is primarily due to school buses.

Figure 1–5: Primary Mode used for each Trip Purpose

- ***Approximately 67% of all intra-county trips and 95% of all inter-county trips in the region were made by automobile, while 66% of travel to Manhattan was made by rail.***

New York City (the five boroughs) impacts these numbers greatly; for counties outside of the City, 84% of intra-county trips are made by auto.

Figure 1–6: Primary Mode used for each Destination Location

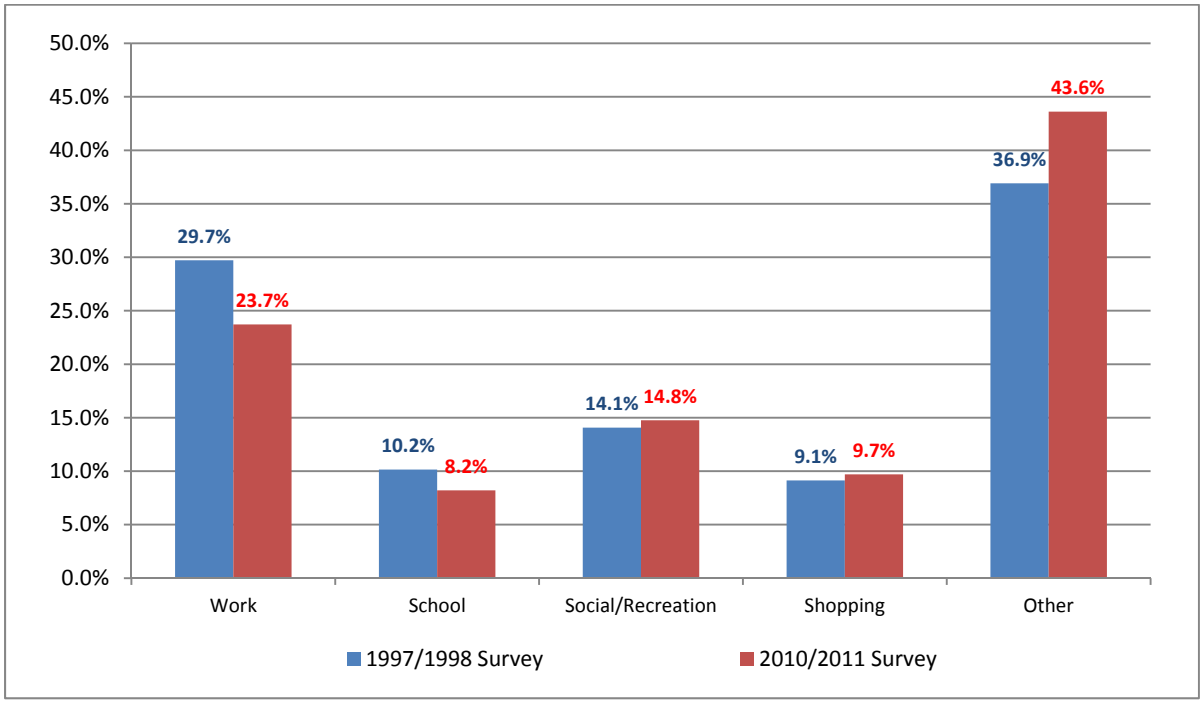


Why we travel:

- ***33% OF TRIPS ARE BETWEEN HOME AND THREE MAJOR DESTINATIONS (SOCIAL/RECREATION, SHOPPING, AND SCHOOL); 24% OF TRIPS INVOLVE THE WORKPLACE***
- ***OUT OF 44% OTHER TRIPS, 22%OF TRIPS INVOLVE NON-HOME BASED AND NON-WORK BASED TRIPS; THE OTHER 22%ARE HOME-BASED OTHER TRIPS SUCHAS PERSONAL BUSINESS AND SERVICING PASSENGERS (PICKING UP & DROPPING OFF)***

Close to a quarter of all trips are work related, whether commuting to or from work or other trips made due to work obligations (e.g., attending a business meeting). The 2010/2011 survey shows higher shopping and social/recreation trips than 1997/1998; however some of this increase might be due to a better accounting of these trips in the 2010/2011 survey. The GPS component of the survey indicated a tendency to under-report non-work trips in the travel diary; this under-reporting may explain differences in results between the surveys and has been adjusted in the 2010/2011 numbers.

Figure 1–7: Percentage of Trips by Trip Purpose



When We Travel:

The time periods throughout the day people make their trips have not changed greatly from 1997/1998. Figures 8 and 9 show the distribution of work trips by hour of the day. When aggregating these hours into five time periods (Night, AM Peak, Midday, PM Peak, and Evening), the distribution by time period has changed very little. For example, the figures show a small increase in both work (30% to 31%) and non-work trips (39% to 42%) for the midday (10:00 am-4:00 pm) period. There has also been a slight decrease in work (5% to 4%) and non-work (11% to 8%) trips during the Evening period (8:00 pm-12:00am). Most of this change is due to the GPS adjustment; the GPS portion of the survey provided better accounting of non-work trips.

Figure 1–8: Distribution of Trips by Time of Day and Time Period (Work Trips)

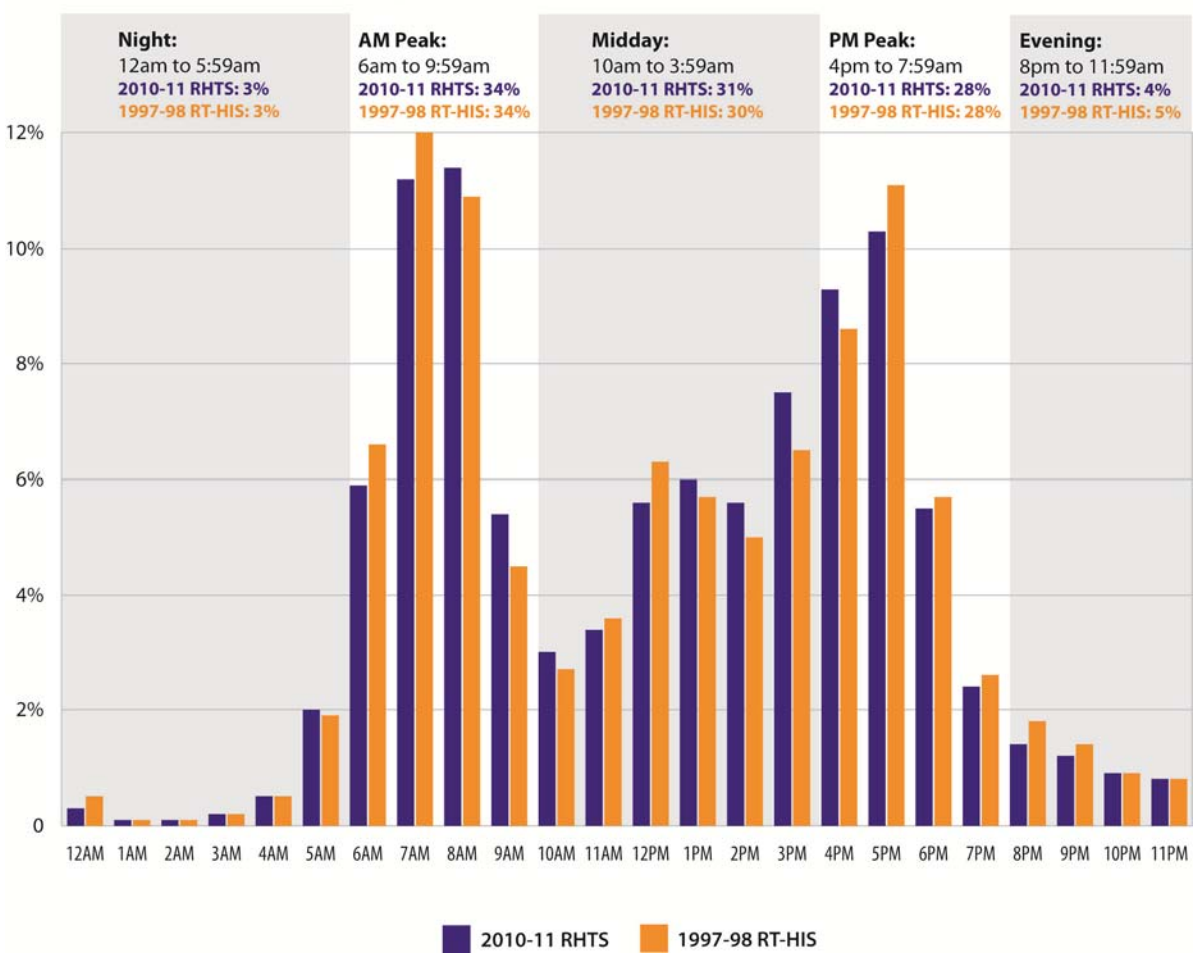
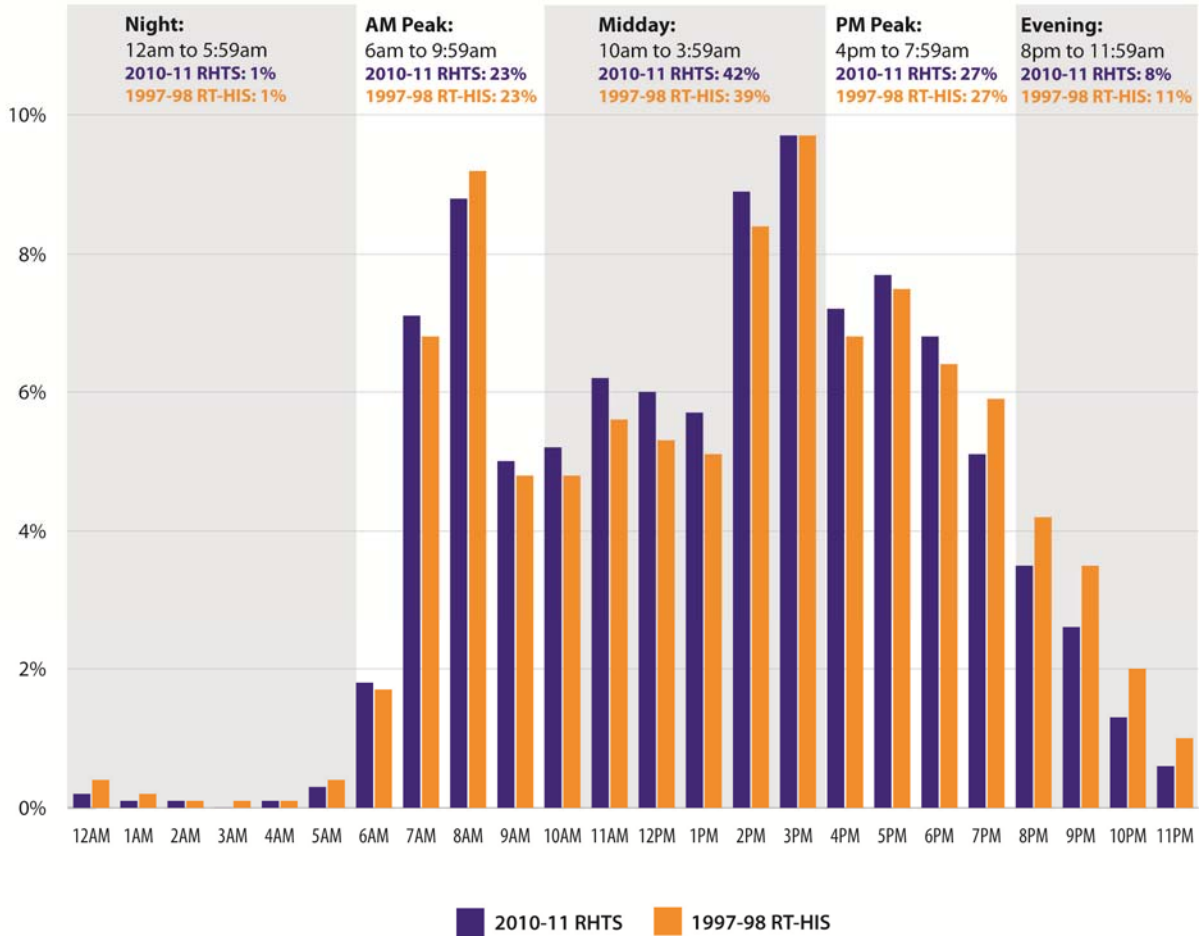


Figure 1–9: Distribution of Trips by Time Period (Non-Work Trips)



The average number of trips made by each person in a household during the 2010/2011 survey period did not vary substantially across days of the week (between 3.9 and 4.2 trips per person, with an average of 4.0). In 2010-2012 RHTS, there were slightly fewer work trips on Mondays and Fridays, while non-work trips were similar regardless of the day of the week.

Table 1-7: Person Trip Rates by Day of Week

Day of Week	Work Trip	Non-Work Trip	Total Weekday
Monday	0.9	3.0	**4.0**
Tuesday	1.0	3.2	**4.2**
Wednesday	1.0	3.0	**4.0**
Thursday	1.0	3.0	**4.0**
Friday	0.8	3.1	**3.9**
Overall	1.0	3.1	**4.0**

- ***WORK TRIPS IN THE REGION NORMALLY TOOK BETWEEN 32 AND 35 MINUTES, WITH WORK TRIPS FROM MANHATTAN AVERAGING 30 MINUTES, WHILE WORK TRIPS FROM THE OTHER NYC BOROUGHS AVERAGED 42 MINUTES (THE HIGH IN THE REGION)***

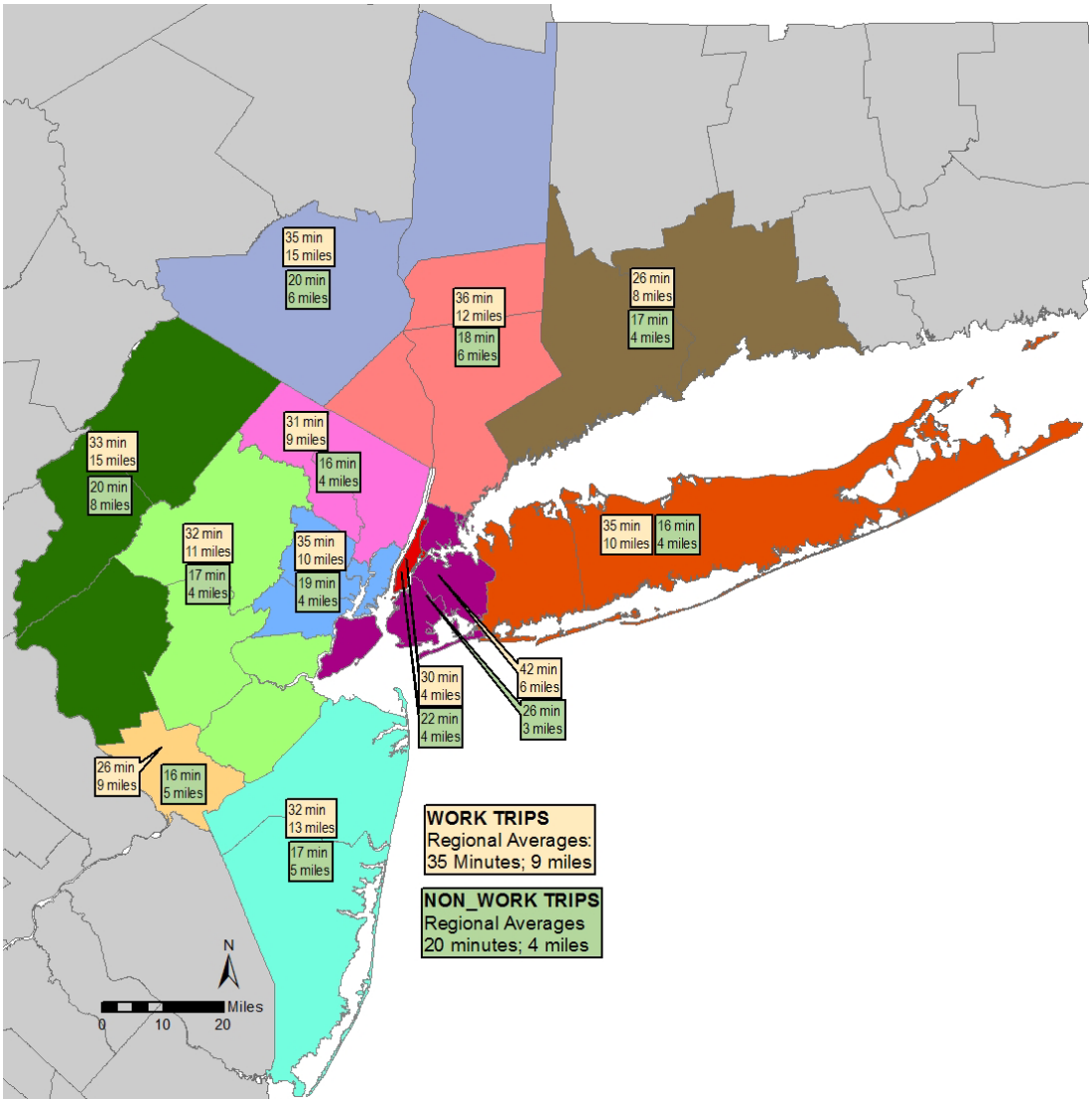
There was minimal difference in travel times between the 1997/1998 survey and the 2010/2011 survey, as shown in Table 1-8. The mean work travel times reported in the 2010/2011 survey are slightly longer; however, the median work travel times are equal, which implies a minor increase in the travel times of longer commutes. There is also very little change in the travel time for non-work trips; the decrease in the median travel time appears to be mostly due to the increased reporting of shorter trips.

Table 1-8: Mean and Median Travel Times

	1997/1998 Survey	2010/2011 Survey
	Mean (median)	Mean (median)
Trip Times (all trips)	24 min (15 min)	23 min (15 min)
Work Related	33 min (25 min)	35 min (25 min)
Non-Work Related	20 min (14 min)	20 min (12 min)

Most work trips in the region normally took between 32 and 35 minutes, with work trips from Manhattan averaging 30 minutes, while work trips from the other NYC boroughs averaged 42 minutes (the high in the region). Average trip distances tended to be less (especially for work trips) in the urban areas, while travel times were similar or slightly longer, probably due to the greater usage of slower modes (e.g., walking, local buses).

Figure 1–10: How far and how long do we travel by origin location of trip



The RHTS data will serve as a rich source of data for further analyses and understanding of travel in the NYMTC and NJTPA region for years to come. The full report, including the public dataset, is available for download on both the NYMTC and NJTPA websites (www.nymtc.org and www.njtpa.org)