

Appendix C:

Ridership Forecasting Results Report

LIRR East Side Access Project Final Environmental Impact Statement

Ridership Forecasting Results Report

July 13, 1999

Submitted by:

KPMG LLP



MTA Long Island Rail Road

Version 1.1

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1. INTRODUCTION

This report documents the results of the ridership forecasting process for the Long Island Rail Road East Side Access (LIRR ESA) Draft Environmental Impact Statement (DEIS). The ridership forecasting procedures for the LIRR ESA DEIS are based process embodied in the Metropolitan Transportation Authority Regional Transit Forecasting (MTA RTF) Model. This model was developed as part of the LIRR DEIS project and other on-going MTA transit development projects in the region. The model is a modified 4-step model with trip generation and distribution replaced by a Census/Survey-derived trip table. The model is based on the following sources of information:

- MTA 1995 and 2020 transit networks
- New York City Transit (NYCT) 1995 and 2020 transit networks (inside New York City)
- New York Metropolitan Transportation Council (NYMTC) Interim Analysis Method highway networks and congested speeds
- New York Metropolitan Transportation Council (NYMTC) adopted county-level forecasts of population, employment, and journey-to-work.
- Sub-county forecasts of population and employment developed by Allee King Rosen and Fleming for Manhattan, Long Island City, and the Brooklyn CBD
- MTA forecasts of sub-county population and employment (elsewhere)
- Mode choice procedures originally developed by KPMG for NJ TRANSIT and customized for the East-of-Hudson market using stated preference research conducted by MVA Consultancy for the Lower Manhattan Access Study
- Transit Network assignment procedures calibrated to match observed travel patterns

A summary of the ridership forecasting methodology is presented in Chapter 2 of this report.

These ridership forecasting procedures were used to study the following alternatives:

- **Future Year No-Build.** The no-build represents the future condition assuming that the LIRR-to-Grand Central project is not-built. It does include the existing and committed projects that will occur between the model base year (1995) and the forecast years (2010 and 2020). Selected key projects that are assumed to exist in the No-Build include NYCT's Queens Boulevard Connection to the 63rd Street Tunnel, the LIRR Dual-Mode Program, and the LIRR Penn 42 Program.
- **Future Year TSM.** The TSM project was defined as part of the LIRR East Side Access Major Investment Study. It includes LIRR passenger capacity improvements, increased service to Hunterspoint Avenue, and extension of the existing (in-bound only) contra-flow bus lanes on the Long Island Expressway.
- **Future Year LIRR-to-Grand Central Terminal Build.** The build project involves construction of the LIRR East Side Access Project to Grand Central Terminal. In this alternative, 24 trains in the AM Peak Hour are operated to Grand Central. Service to Penn Station is reduced from 42 peak hour trains in the No-Build to 37 trains. This alternative also includes the construction of a new LIRR passenger station at Sunnyside Yard in Queens.

The definition of each alternative is defined in Chapter 3 of this report.

Chapters 4 and 5 present an overview of the results of the ridership forecasting methodology. Chapter 4 presents the results for the different 2010 alternatives and Chapter 5 presents an overview of the different 2020 alternatives.

Chapter 6 presents an assessment of the risks associated with the forecast. This chapter discusses what is how changes to the assumptions affect the forecasted outcomes. It also includes a discussion of how the key results from the model (i.e., LIRR-to-GCT patronage) have been assessed for reasonableness.

The appendix to this report include detailed tables of results including station volumes, station access vehicle trips, station parking demand, and impacts on NYCT services.

2. DEMAND FORECASTING METHODOLOGY

This chapter provides an brief description of the travel demand forecasting methodology used to prepare forecasts for the Long Island Rail Road East Side Access (LIRR ESA) Draft Environmental Impact Statement (DEIS). The methodology is based on a model that was jointly developed for the LIRR ESA DEIS project in conjunction with other on-going regional transit projects, most notably the Metropolitan Transportation Authority (MTA) Lower Manhattan Access Study (LMAS). The resulting model has been designated as the Metropolitan Transportation Authority Regional Transit Forecasting (MTA RTF) Model and will also be used to analyze the ridership implications associated with other ongoing Long-Range Planning Framework projects including:

- MTA Lower Manhattan Access Study
- Port Authority of NY and NJ/MTA/NJ Transit Access to the Region's Core (ARC) Phase 3 (East-of-Hudson)
- Metro-North Railroad (MNR) Penn Station Access Project

A more complete discussion of the methodology appears in *Metropolitan Transportation Authority Regional Transit Forecasting Model Methods Report* dated June 10, 1999. This chapter describes the key elements of the model to assist the reader in interpreting the forecasts that appear later in this document.

2.1 Overview of Demand Forecasting Methodology

The ridership forecasting methodology for the LIRR ESA DEIS is based on the data and models developed as part of the Metropolitan Transportation Authority Long-Range Planning Framework. It represents the synthesis of three different elements of the framework:

- **Long Island Rail Road East Side Access Major Investment Study (LIRR ESA MIS)/Access to the Region's Core (ARC) Model.** The basic design and programming for the MTA RTF Model is based on the model originally developed for the East Side Access Major Investment Study Project and also applied for the Access to the Region's Core Project. Much of the model data relating to suburban conditions is also obtained from this model.
- **New York City Transit Manhattan East Side Alternatives (MESA) Project.** The MTA RTF Model borrows New York City-specific data and procedures from MESA—an ongoing effort to improve subway and other transit services on Manhattan's East Side. In particular, the networks and New York City Transit validation data have been updated to be consistent with the most recent information from the MESA model. Furthermore, information on the sub-county distribution of population and employment in Manhattan for the MTA RTF model have been developed from an updated version of the forecasts originally developed by AKRF for the MESA project.
- **Metropolitan Transportation Authority Long-Range Travel Forecast Study (MTA LRTFS).** Regional population, household, and employment data (outside Manhattan) at a detailed sub-county level have been developed from the MTA LRTFS. This information is used to project changes in the overall demand for travel beyond the model's 1995 base.

The MTA RTF Model is similar in functional design to a conventional four-step demand forecasting model. In the traditional model, the four steps are defined as:

1. **Trip Generation.** Determine the number of total person trips produced in and attracted to each geographic area (zone) in the region.

2. **Trip Distribution.** Link trip productions (the home end of a trip) to trip attractions (the non-home end) to develop a zone-to-zone table of travel. This table projects the total demand (or total market) for travel via all modes between every combination of zones in the region.
3. **Mode Choice.** Determine the mode of travel (e.g., automobile versus transit) and transit sub-modes (e.g., commuter rail, subway, or bus). This sub-model projects the mode (or market) share for each travel mode in the region. This share is determined for each zone-to-zone combination in the region based on the characteristics of each travel mode and the characteristics of the users.
4. **Assignment.** Determine the travel path (e.g., which highways or trains) are used. This is done separately for each submode estimated in mode choice. The choice of path is based on a weighted combination of travel time, out-of-vehicle time, fare, transfers, and congestion.

To better represent the potential demand for transit, the MTA RTF Model bypasses the first two steps of the four-step model and substitutes an alternative survey- and Census-based approach for developing person trip tables. This survey/Census approach has been used for the MTA RTF Model (and for most other transit models in the region) since traditional trip generation/distribution models typically do a relatively poor job of replicating observed zone-to-zone travel demand patterns. Knowledge of actual zone-to-zone travel patterns is particularly important for transit planning since customers are sensitive to the availability of direct transit services with a minimum of transfers. To be able to guide the design of the most effective transit services, models must replicate, as closely as possible, the true origin and destination of travel. Experience in the New York metropolitan area has shown that survey- and Census-derived trip tables are most effective for representing these travel patterns.

The utilization of survey/Census-derived person trip tables rather than trip generation and distribution models means that an alternative approach is required for developing projections of total travel demand for the forecast years. In the MTA RTF Model, the forecast year person trip tables are developed by factoring (or “growing”) the base year person trip table based on the relative growth in population, households, employment, and journey-to-work travel in each portion of the metropolitan area.

2.2 Travel Markets

The MTA RTF Model represents most regional travel in the New York Metropolitan area and, in particular, is designed to estimate trips for the following markets:

1. LIRR and MNR Commuters to Manhattan
2. NYCT Subway and Bus customers, particularly those attracted to destinations in Manhattan
3. Automobile travelers from the New York and Connecticut portions of the region to Manhattan who currently choose not to use the transit because the locations of the city terminals (Grand Central, Penn Station, Hunterspoint, Long Island City, or Flatbush Avenue) are not convenient to the traveler's trip origin or destination or because the connections to their destination are inconvenient.
4. Transit customers from New Jersey to Manhattan

The major trip purposes to be considered include:

- Home-based work
- Home-based other
- Non-home-based

The data and procedures used to develop these projections do not include:

1. Air travelers with a place residence outside of the New York portion of the New York metropolitan area.
2. Automobile travelers to or from New Jersey.
3. Trips or travel that is made entirely by non-motorized forms of transportation or entirely by taxi.

Because air travelers may have some impact on the regional commuter rail system particularly after the construction of the JFK LRS system connecting Kennedy Airport to the LIRR at Jamaica, and because forecasts are now being prepared for this system as part of the ongoing MTA One-Seat Ride project, these passengers will be manually assigned to the LIRR system as a post-model activity.

2.3 Geographic Area System

The geographic area system for the MTA RTF Model consists of the entire MTA service area and includes all of the following counties:

- **New York State**
 - New York (Manhattan)
 - Bronx
 - Kings (Brooklyn)
 - Queens
 - Richmond (Staten Island)
 - Nassau
 - Suffolk
 - Westchester
 - Putnam
 - Dutchess
 - Rockland
 - Orange
- **Connecticut**
 - Fairfield
 - New Haven
 - Litchfield

Geographic subdivisions are as follows:

- MESA zones (tracts and selected sub-tract subdivisions) in Manhattan
- Census Tracts in Nassau, Suffolk, and Fairfield Counties

- Aggregated Census Tracts mostly based on NYMTC Traffic Analysis Zones in Bronx, Brooklyn, Queens, and Westchester Counties
- Port Authority of NY and NJ/NJ Transit zones in Richmond, Orange, and Rockland Counties
- Minor Civil Divisions in Putnam and Dutchess Counties
- Counties for New Haven and Litchfield Counties

2.4 Highway Networks

The regional highway system is characterized using a network representation of all expressways, parkways, and arterial roadways in the geographic area described above. Highway networks representing peak congested conditions in 1990, 1996, 2015, and 2020 were obtained from the Interim Analysis Methods model developed by Parsons Brinckerhoff for the New York Metropolitan Transportation Council.

Congested speeds for that network are a combination of:

- PPAQ (Post Processor for Air Quality) estimated travel speeds (expressway and arterial links) and
- TRANPLAN congested speeds (for all other links).

Since PPAQ speeds were available for 1990 and 2015 only, 1990 speeds were posted to the 1996 network and 2015 speeds were posted to the 2020 network. Given that relatively few changes to the highway system have occurred between 1995 and 1996, the 1996 NYMTC network is assumed to be representative of 1995 conditions for purposes of estimating 1995 transit travel demand.

2.5 Year 1995 Transit Networks

The transit networks for the MTA RTF Model are derived from two basic sources:

- The TRANSCAD 2.1 transit network prepared by MTA and URS Greiner for the MTA Long Range Travel Forecast Study (LRTFS).
- The TRANSCAD 2.1 networks developed by New York City Transit for the MESA project with updated and refined representations of NYCT transit services, Manhattan sidewalk links, and NYCT access, egress, and transfer links.

Key elements of the MTA RTF Networks are described in the following subsections.

2.5.1 Network Scope

The MTA RTF Model transit networks include representations of most AM Peak Hour services in the New York metropolitan area (east of the Hudson River) and all of the existing (Year 1995) transit service relevant to the on-going LRPF projects. Coded services were obtained from the MTA LRTFS and NYCT MESA networks and include:

- All AM Peak Hours Long Island Rail Road (LIRR) and Metro-North Railroad (MNR) services (shown in Figure 2-1)
- AM Peak Hour NYCT Subway and PATH routes (shown in Figure 2-2)
- AM Peak Hour Staten Island Ferry (dashed line in Figure 2-2) and New Jersey ferry services

- AM Peak Hour NYCT, MSBA/LI Bus, and other regional bus services (shown in Figure 2-3)

2.5.2 Zonal Access and Egress Links

Zonal access (and egress) links are used to describe the means by which travelers can access the regional transit system either on foot or by car. In the MTA RTF model, these links are based on the access and egress links originally coded in the MTA LRTFS and NYCT MESA transit networks and converted to the Geographic System used in the MTA RTF Model. Access and egress links to commuter rail stations were manually recoded as part of the MTA RTF development to better represent expected station capture areas.

The distance on each link is computed based on the straight-line distance between the zone centroid and the transit node. An assumed speed of 1.6 mph was used to compute the travel time over all walk links. To account for situations where access to transit is predominantly made by automobile, travel times on links serving park-and-ride stations were adjusted to represent realistic automobile travel times as shown in Table 2-1.

Table 2-1 Drive Connect Speed Assumptions

(Applied to Centroid-to-PNR Connectors)

County	State	Assumed Speed
		(mph)
New York	NY	15
Kings	NY	15
Queens	NY	15
Nassau	NY	25
Suffolk	NY	35
Bronx	NY	15
Westchester	NY	25
Putnam	NY	35
Dutchess	NY	45
Fairfield	CT	35
Richmond	NY	15
Rockland	NY	35
Orange	NY	35
Litchfield	CT	35
New Haven	CT	35

Source: Parsons Brinckerhoff, LIRR Network Strategy Study

Figure 2-1 Commuter Rail Network

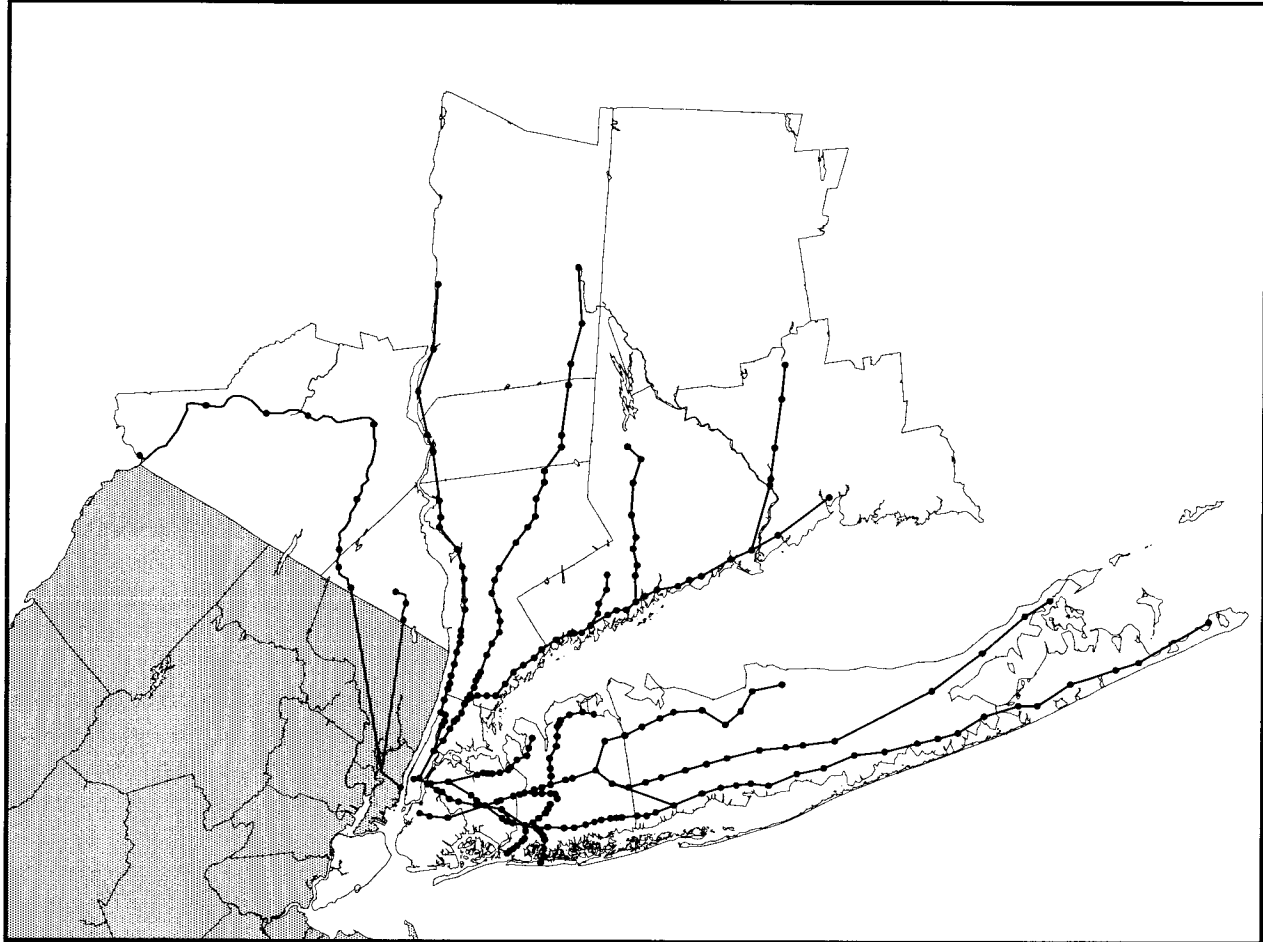


Figure 2-2 Subway, PATH and Ferry Network

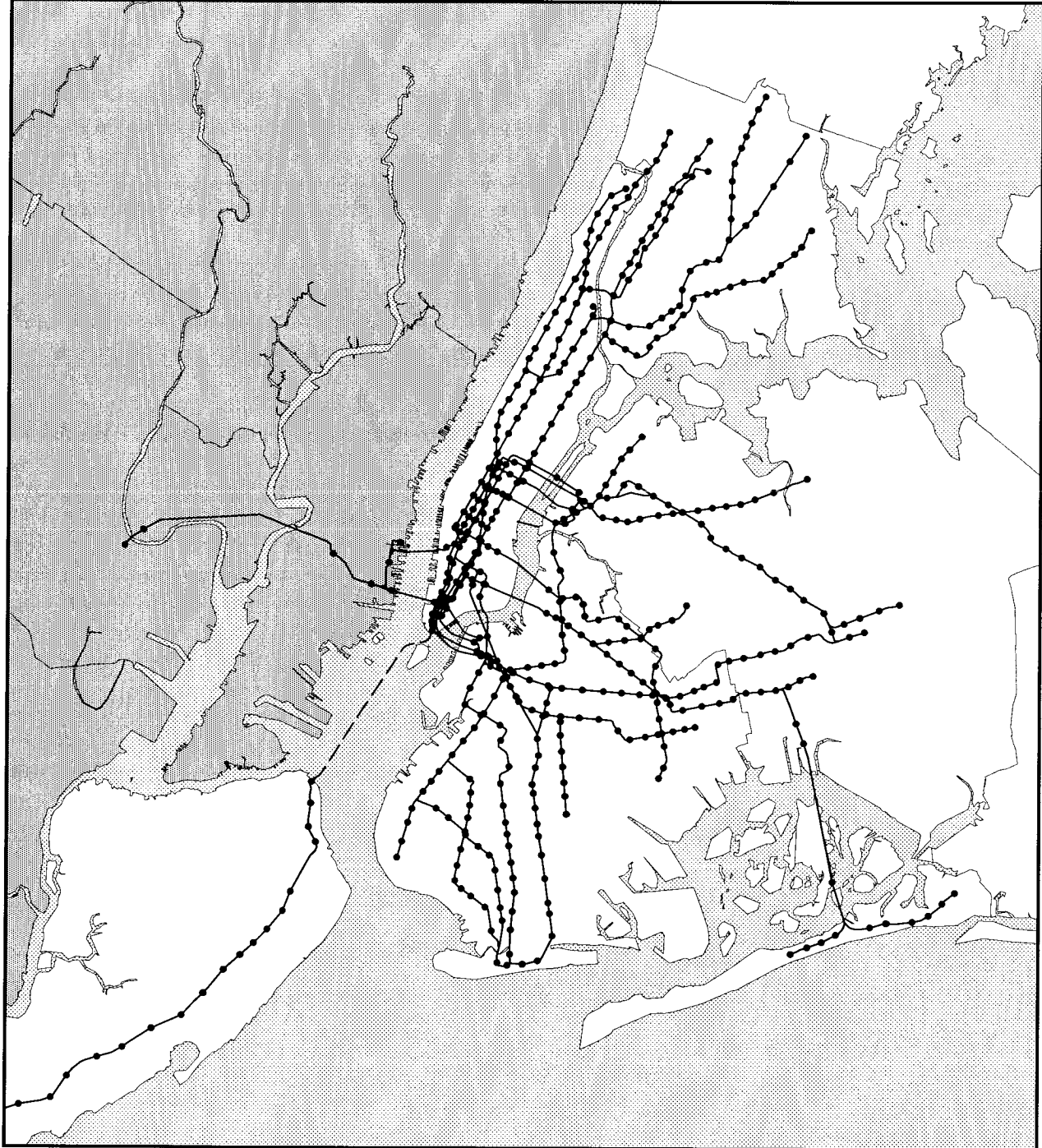
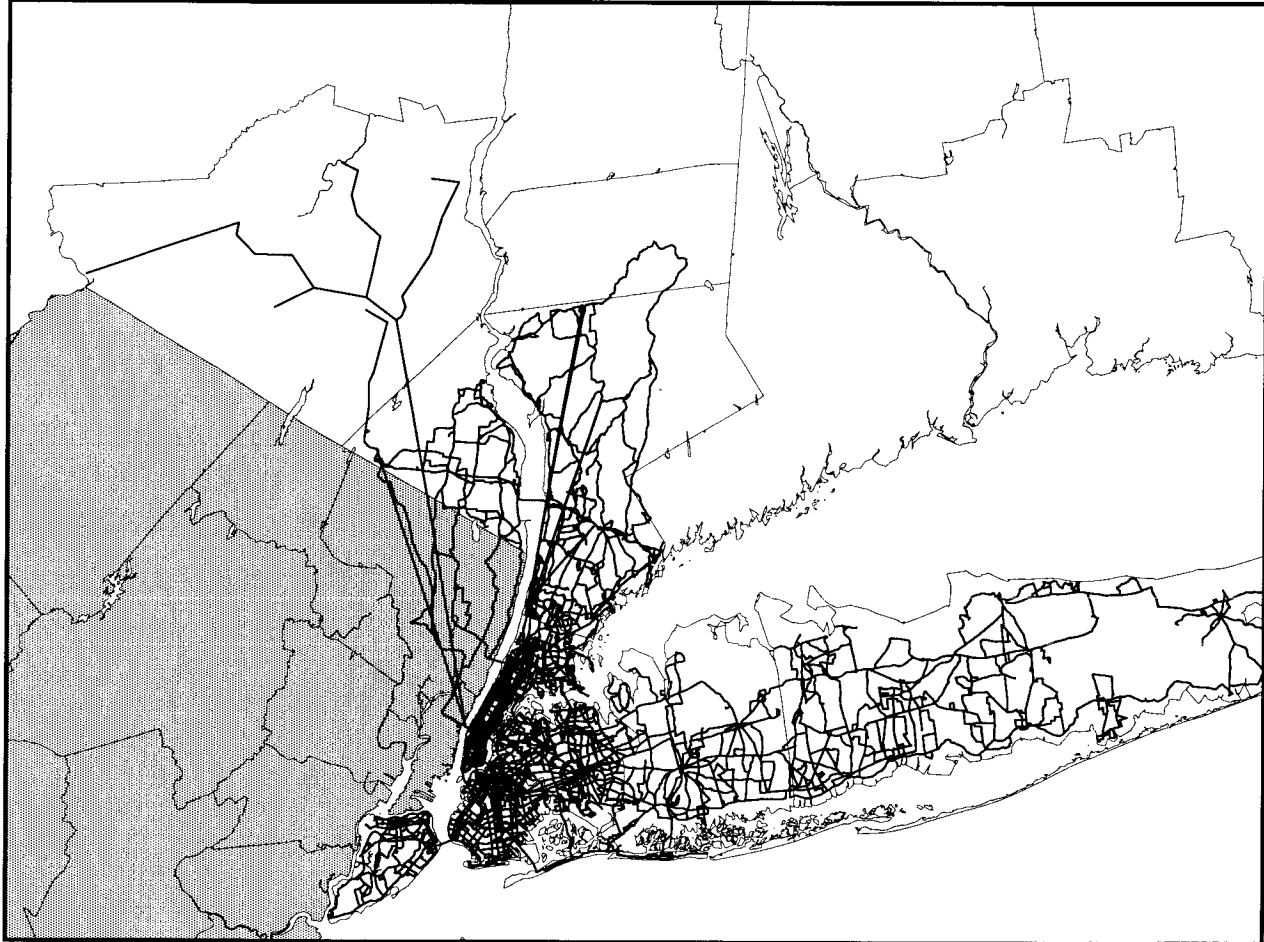


Figure 2-3 Regional Bus Network



2.5.3 In-Vehicle Times

Transit in-vehicle times are based on the coded values provided by MTA for each route. In cases where one route represents several trains, the coded time represents the average for all trains. In-vehicle travel times for LIRR and MNR services were compared to scheduled times as discussed later in this section and adjusted as necessary to assure that the network representation of running time matches the scheduled times.

2.5.4 Out-of-Vehicle Travel Times

With the exception of drive-to-transit centroid connectors and subway-to-subway transfer links, out-of-vehicle times are based on the distance coded on the link and an assumed travel speed of 1.6 miles per hour. Drive-to-transit speeds are described in Section 2.5.2 and subway-to-subway transfer times are based on platform-to-platform walking times collected by NYCT.

2.5.5 Waiting Times

With the exception of commuter rail services, waiting times are set equal to the "combined waiting time" field which represents the combined effect of all routes or services on the line. This field was calculated by the MTA/NYCT by analyzing all routes that connect each node to the Manhattan CBD, counting the number of trains/buses per hour providing that service, dividing total trains/buses into 60 minutes to determine the combined headway, and dividing by 2 to determine the average waiting time.

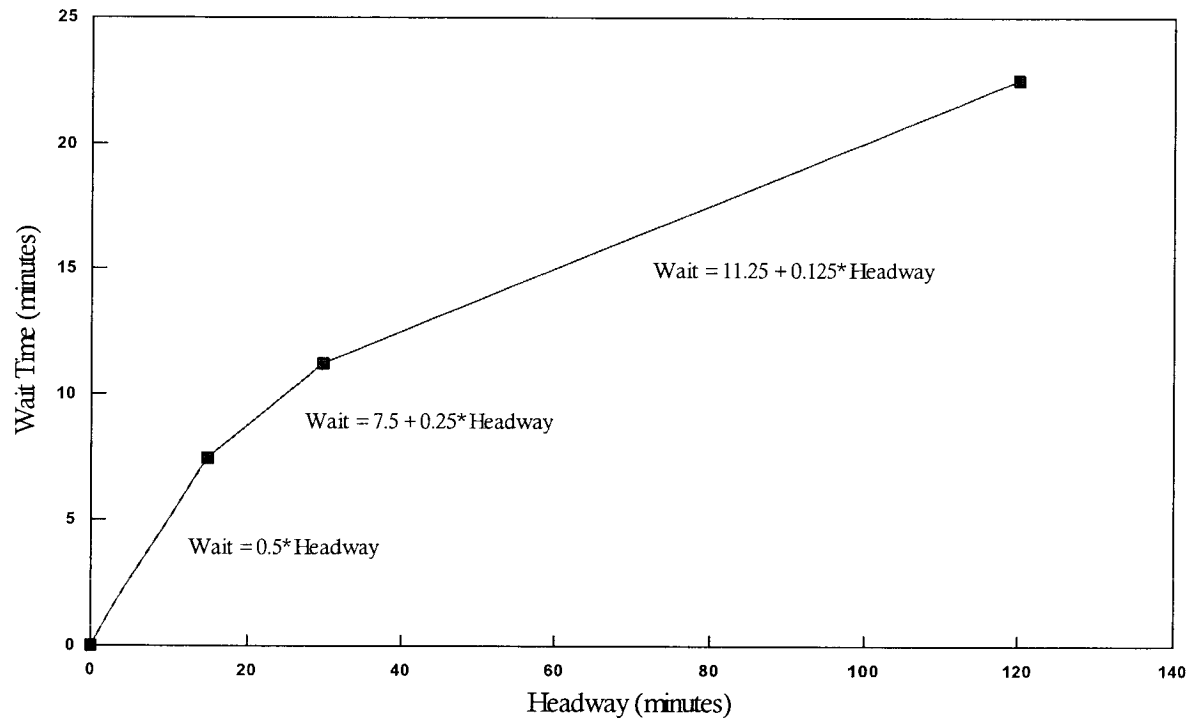
LIRR waiting times were computed using an automated procedure that calculates the number of trains connecting each LIRR station to each of the five existing or proposed terminal stations: New York Penn Station, Grand Central Terminal, Hunterspoint Avenue, Long Island City, and Flatbush Avenue. The combined headway is computed separately for each origin station/terminal station/direction (inbound/outbound) as 60 minutes divided by the total number of trains in the peak hour. The average waiting time is computed from the combined headway based on the relationship developed by Parsons Brinckerhoff for the LIRR Network Strategy Study and shown in Figure 2-4.

A similar procedure is applied for each MNR station using the combined frequency of trains traveling to either Grand Central Terminal or a new MNR Terminal in Manhattan.

2.5.6 Manhattan Sidewalk Network

A sidewalk network is provided in the Manhattan CBD and portions of Brooklyn to provide walk access between each zone and all transit facilities in the region. Out-of-vehicle travel time on all sidewalk links is computed assuming an average speed of 1.6 miles per hour.

Figure 2-4 Computation of Waiting Time for Commuter Rail Services



Source: Parsons Brinckerhoff, LIRR Network Strategy Study

2.5.7 Year 1995 Fare Coding

Fares are based on the coding approach established by MTA to represent Year 1995 (before the November 12 fare increase) tariffs and are expressed in 1995 cents. The procedures used for coding fares are different for each mode and are described below.

- **Commuter Rail.** Fares are computed by coding a fare value on all station access links, station egress links, and on links where trains cross one or more fare zone boundaries. The commuter rail fare is the sum of all three components. The coded fares for 1995 are displayed in Tables 2-2, 2-3, and 2-4.

Table 2-2 LIRR 1995 Fare Calculation (in Year 1995 Cents)

Fare Zone	Charge to Next Fare Zone	Boarding Charge	Alighting Charge	Total Fare to Zone 1
14	63	62	62	622
12	50	62	62	559
11	36	62	62	509
10	45	62	62	473
9	49	62	62	428
7	47	56	56	373
4	90	56	56	326
3	55	101	101	281
1	N/A	125	125	250

Note: Fares effective for 1995 before 11/12/95 and represent a weighted average of the cost of different fare media.

Table 2-3 Metro-North Hudson/Harlem Line 1995 Fare Calculation (in Year 1995 Cents)

Hudson Fare Zone	Harlem Fare Zone	Charge to Next Fare Zone	Boarding Charge	Alighting Charge	Total Fare to GCT
Poughkeepsie	Dover Plains-Harlem Vy	55	36	36	607
New Hamburg-Beacon	Appl. Trail-Patterson	57	36	36	552
Breakneck Ridge-Manitou	Brewster North-Purdy's	43	36	36	495
Crugers-Peekskill	Golden's Br-Mt Kisco	60	36	36	452
Tarrytown-Croton Harmon	Chappaqua-Valhalla	55	36	36	392
Hastings-Irvington	N White Plains-Scarsdale	36	36	36	337
Ludlow-Graystone	Crestwood-Mt Vernon W	32	36	36	301
Morris Heights-Riverdale	Wakefield-Melrose	120	25	25	258
125 th Street	125 th Street	0	113	113	226
Grand Central Terminal	Grand Central Terminal	N/A	113	113	N/A

Note: Coded fares represent a weighted average of the cost of different fare media.

Table 2-4 Metro-North New Have Line 1995 Fare Calculation (in Year 1995 Cents)

Fare Zone	Charge to Next Fare Zone	Boarding Charge	Alighting Charge	Total Fare to GCT
Derby Shelton-Waterbury (branch at Bridgeprt)	68	35	35	704
Branchville-Danbury	68	35	35	611
Merrit 7-Cannondale (branch at S Norwalk)	3	35	35	543
Glenbrook-New Caanan (branch at Stamford)	0	35	35	504
New Haven	86	35	35	722
Bridgeport-Milford	60	35	35	636
Westport-Fairfield	36	35	35	576
South Norwalk-East Norwalk	36	35	35	540
Noroton Heights-Rowayton	0	35	35	504
Stamford	52	35	35	504
Greenwich-Old Greenwich	67	35	35	452
Rye-Port Chester	28	15	15	365
Larchmont-Harrison	37	15	15	337
Mount Vernon-New Rochelle	52	15	15	300
Fordham	120	25	25	258
125 th Street	0	113	113	226
Grand Central Terminal	n/a	113	113	N/A

Note: Coded fares represent a weighted average of the cost of different fare media.

- **NYCT Subway.** Fares are computed by coding a \$1.50 fare on all subway station access links (zone connectors and intermodal transfer links-to/from-subway station). No fare is charged on station egress links. Likewise, no charge is assessed for 3rd Avenue (Bronx) buses with a free transfer in 1995 to the 3rd Avenue-149th Street subway station.

- **Bus.** Fares are computed as a combination of boarding and fare zone charges. For NYCT buses, a flat \$1.50 charge is coded on bus access links and on transfers from subway-to-bus. MTA-provided fares were used for all other bus operators.

2.5.8 Commuter Rail Service Coding Review

Coded LIRR and MNR commuter rail services were compared to published 1995 schedules to confirm the appropriateness of the network for evaluating the alternative projects for each railroad. This comparison is presented in Table 2-5 (LIRR) and 2-6 (MNR) and indicates that the networks properly represent each carrier's passenger services.

Table 2-5 Comparison of Coded and Scheduled Base Year AM Peak Hour LIRR Services

Branch	Service	Scheduled			Coded		
		Train #	Trains/ Hour	Running time	Route #	Trains/Hr	Running Time
Port Washington	Port Wash-Great Neck Express to NYPS	419,421,425, 427	3-4	34-41	501	3-4	36.7
	Port Wash-Manhasset Local to NYPS	423	1	47	502	1	47.5
	Great Neck/Little Neck-Bayside Express to NYPS	303,305	1-2	33	503	1-2	33.5
	Great Neck Local to NYPS	307	1	34	504	1	33.5
Port Jefferson	Port Jeff-Syosset Express to Hunterspoint	609	1	106	505	1	106
	Port Jeff-Huntington Express to Jamaica/Hunterspoint	607,611	1-2	107-109	506	1-2	107
	Hicksville Local to Jamaica/NYPS	1209,1213	1-2	44-48	507	1-2	47
	Hicksville-Carle Place Express to NYPS	1211	1	47	508	1	47
	Huntington-Syosset Express to NYPS	1619,1623	2	54-57	509	2	55.5
	Huntington Local to Jamaica/Flatbush	1621	1	60	510	1	59.5
Ronkonkoma	Greenport-Hicksville Express to NYPS	201/2017	1	159	511	1	159
	Ronkonkoma-Brentwood Express to NYPS	2019	1	63	512	1	63
	Ronkonkoma-Bethpage Express to Jamaica/NYPS	2021	1	75	513	1	78
	Ronkonkoma Local to Jamaica and Flatbush	2099	1	76	514	1	75.5
Oyster Bay	Oyster Bay Local to Jamaica/Long Island City	507	1	n/a	515	1	89.5
	Oyster Bay Local to Jamaica/Hunterspoint	509	1	80	516	1	80
	E Williston Local to Jamaica/NYPS	1501	1	45	517	1	46
Hempstead	Hempstead Local to Jamaica/Flatbush	719,721	1-2	50-54	518	1-2	52
	Hempstead Local to Jamaica/NYPS	717,723	1-2	46-47	519	2	47
West Hempstead	West Hempstead Local to Jamaica/Flatbush	905	1	46	520	1	44.5
	West Hempstead Local to Jamaica/NYPS	907	1	51	521	1	50
Far Rockaway	Far Rockaway Local to Jamaica/Flatbush	3011,3013	1-2	48-57	522	1-2	50
	Far Rockaway Local to Jamaica/NYPS	3203,3013	1-2	53-56	523	1-2	57
	Valley Stream Local to Jamaica/NYPS	1901	1	37	524	1	45
Long Beach	Long Beach-Valley Stream-Laurelton Express to NYPS	815	1	52	525	1	52
	Long Beach--Lynbrook Express to NYPS (schedule shows additional stop at Valley Stream)	817	1	52	526	1	47
	Long Beach Local to Jamaica/NYPS	819	1	50	527	1	52
	Long Beach Local to Jamaica/Flatbush	820	1	48	528	1	47.5
	Babylon-Rockville Center Local to Jamaica/Flatbush	1011,107, 1017, 113	2	69-73	529	2	68.5
Babylon	Babylon-Baldwin to Jamaica/NYPS	109,111	1	72	530	1	73
	Babylon-Baldwin Express to NYPS	1013,1199, 1015,1099, 1019,115, 1105,117	2-3	70	531	2-3	65.5
	Patchogue to Jamaica/Long Island City	41	1	N/A	532	1	109.5
Babylon thru Montauk	Montauk-Sayville Express to Jamaica/Hunterspoint	13	1	182	533	1	181
	Speonk to Jamaica/NYPS	11/111	1	132	534	1	132

Table 2-6 Comparison of Coded and Scheduled Base Year AM Peak Hour MNR Services

Branch	Service	Scheduled			Coded		
		Train #	Trains/Hr	Running time	Route #	Trains/Hr	Running Time
Pascack Valley	Spring Valley/Pearl River to Hoboken	1604,1606, 1608,1610	4	59-65	206	4	59.00
Port Jervis	Port Jervis/Suffern to Hoboken	52,54	2	135-134	207	2	134.50
New Haven	Waterbury Local to Bridgeport	1933	1	54	205	1	54.00
	New Haven/East Norwalk to GCT	1427-1529	1-2	95	551	1-2	95.50
	New Canaan/Stamford to GCT	1723	1	69	552	1	69.00
	New Canaan/Glenbrook to GCT	1731	1	67	553	1	67.00
	Harrison Local to GCT	1319,1327,1231	3	40-41	554	3	40.50
	Stamford Local to GCT	1217,1321, 1225,1229	1-4	74	555	1-4	74.00
	New Haven/Harrison to GCT	1323,1325, 1331,1629	1-3	118	556	1-3	116.50
	New Haven/Stamford to GCT	1521,1533	1-2	107	557	1-2	104.50
	Danbury/Stamford to GCT	1429,1833	1-2	119	558	1-2	120.00
	Danbury/South Norwalk to GCT	1819	1	108	559	1	108.00
Harlem	Fleetwood Local to GCT	316,324,328	1-3	33-38	561	1-3	34.50
	Scarsdale Local to GCT	518,524,632	1-3	53	562	1-3	53.00
	Hartsdale/Scarsdale to GCT	520,526,532	3	38-39	563	3	38.50
	Dover Plains/White Plains to GCT	922,3928,528, 928	1-4	113-126	564	1-4	122.00
	Brewster North/White Plains to GCT	918,924,930	2-3	78-90	565	2-3	80.50
Hudson	Croton-Harmon/Marble Hill to GCT	420,730,430	1-3	69	571	1-3	74.00
	Croton-Harmon/Morris Heights to GCT	722	1	70	572	1	68.00
	Croton-Harmon/Tarrytown Express to GCT	718,720,726, 728,736	1-4	51	573	2-4	50.00
	Irvington/Greystone to GCT	724,734	1-2	44	574	1-2	43.50
	Poughkeepsie/Croton-Harmon to GCT	730,836	2	106	575	2	106.00
	Poughkeepsie/Beacon Express to GCT	832	1	90	576	1	90.00

2.6 Year 2010 and 2020 No-Build Transit Networks

2.6.1 Year 2010 and 2020 Physical and Service Characteristics

The 2010 and 2020 no-build transit networks are identical and are based on the MTA and NYCT MESA 2020 AM Peak Hour no-build networks. These networks are generally similar to the 1995 AM Peak Hour base network and incorporate the following committed system improvements:

1. Bus service modifications to represent expected future year operations
2. NYCT coding of the Year 2020 No-Build Subway Network. The 2020 Network includes completion of the 63rd Street tunnel and revision of operating plans to utilize this facility
3. Improvements to the LIRR increasing the train capacity into Penn Station from 36 trains in the peak hour to 42 trains per hour
4. LIRR service given acquisition of dual-mode locomotives. This equipment will enable operation of six peak-hour trains from non-electrified branches direct to New York Penn Station
5. Minor changes to MNR operations and the extension of the Harlem Line to Wassaic
6. Free Bus-Subway Transfers
7. Secaucus Transfer in New Jersey which will enable a direct transfer from the MNR Port Jervis and Spring Valley Lines to NJ Transit Northeast Corridor service to Penn Station

2.6.2 Year 2010 and 2020 Fare Coding

Year 2010 and 2020 fares are identical and are based on the representation of MTA fare policies included in the 2020 LRPF network. These policies are based on the assumption that all non-commuter rail fares rise at the rate of inflation. Commuter rail fares in New York are assumed constant between November 1995 and December 1999 at which time they rise at the same rate as inflation. Coding for each mode is as described below.

- **Commuter Rail.** The coded fares were developed from the MTA Long Range Planning Framework Year 2020 fares and adjusted to convert from 1990 dollars (used in the LRPF network) to 1995 dollars (used in the MTA RTF Networks). The resulting boarding, alighting, and zone fares are generally represent a small decrease in fares (in constant dollars) between 1995 and 2020 in New York. Fares from Connecticut rise slightly between 1995 and 2020. Year 2020 Commuter rail fare parameters are as follows:

Table 2-7 LIRR 2020 Fare Calculation (in Year 1995 Cents)

Fare Zone	Charge to Next Fare Zone	Boarding Charge	Alighting Charge	Total Fare to Zone 1
14	62	61	61	603
12	49	61	61	541
11	35	61	61	492
10	43	61	61	457
9	48	61	61	414
7	45	54	54	359
4	86	54	54	314
3	53	97	97	271
1	N/A	121	121	242

Table 2-8 Metro-North Hudson Harlem Line 2020 Fare Calculation (in Year 1995 Cents)

Hudson Fare Zone	Harlem Fare Zone	Charge to Next Fare Zone	Boarding Charge	Alighting Charge	Total Fare to GCT
Poughkeepsie	Dover Plains-Harlem Vy	55	36	36	594
New Hamburg-Beacon	Appl. Trail-Patterson	56	36	36	539
Breakneck Ridge-Manitou	Brewster North-Purdy's	42	36	36	483
Crugers-Peeckskill	Golden's Br-Mt Kisco	60	36	36	441
Tarrytown-Croton Harmon	Chappaqua-Valhalla	53	35	35	380
Hastings-Irvington	N White Plains-Scarsdale	34	35	35	327
Ludlow-Graystone	Crestwood-Mt Vernon W	31	35	35	293
Morris Heights-Riverdale	Wakefield-Melrose	116	24	24	251
125 th Street	125 th Street	0	111	111	222
Grand Central Terminal	Grand Central Terminal	n/a	111	111	N/A

Table 2-9 Metro-North New Have Line 2020 Fare Calculation (in Year 1995 Cents)

Fare Zone	Charge to Next Fare Zone	Boarding Charge	Alighting Charge	Total Fare to GCT
Derby Shelton-Waterbury (branch at Bridgprt)	78	40	40	745
Branchville-Danbury	67	40	40	627
Merrit 7-Cannondale (branch at S Norwalk)	3	40	40	560
Glenbrook-New Caanan (branch at Stamford)	0	40	40	516
New Haven	99	40	40	766
Bridgeport-Milford	69	40	40	667
Westport-Fairfield	41	40	40	598
South Norwalk-East Norwalk	41	40	40	557
Noroton Heights-Rowayton	0	40	40	516
Stamford	60	40	40	516
Greenwich-Old Greenwich	77	40	40	456
Rye-Port Chester	27	15	15	354
Larchmont-Harrison	35	15	15	327
Mount Vernon-New Rochelle	50	15	15	292
Fordham	116	24	24	251
125 th Street	0	111	111	222
Grand Central Terminal	N/A	111	111	N/A

Note: Equivalent to monthly pass cost/38 trips per month.

- **NYCT Subway.** Year 2020 Fares are computed by coding a \$1.50 fare (1995 dollars) on all subway station access links (zone connectors and intermodal transfer links-to/from-subway station). No fare is charged on station egress links. To represent the Metro Card free bus-to-subway transfer, no fare is charged on bus-to-subway transfer links.
- **Bus.** Fares are computed as a combination of boarding and fare zone charges. For NYCT buses, a flat \$1.50 fare is charged on boarding. No fare is charged on subway-to-bus transfers or bus-to-bus.

2.7 Socioeconomic Projections

Projections of population and employment are a fundamental element of the travel forecasting process and are used for “growing” or “factoring” 1995 travel patterns to represent expected Year 2020 travel.

Socioeconomic projections are based on NYMTC and MTA adopted forecasts and comprise three types of information:

1. NYMTC forecasts of county-level attributes such as population, labor force, and employment
2. NYMTC forecasts of county-to-county journey-to-work flows
3. MTA forecasts of sub-county population and employment

Each element is discussed below.

2.7.1 NYMTC County-Level Forecasts of Population, Labor Force and Employment

Forecasts of county-level population, labor force and employment are both directly used in the MTA RTF Model procedures and are also used in the development of the underlying NYMTC county-to-county journey-to-work flows and MTA subcounty forecasts of population and employment. This section does not document the methodology used to develop these forecasts (available from NYMTC and MTA) but instead documents results of these forecasting methodologies.

Projected population by county between 1970 and 2020 (in 5-year increments after 1990) is presented in Table 2-10. As shown in this table, population in the region is expected to grow from 20.2 million in 1995 to 22.8 million in 2020, an increase of 13.2 percent. Population in New York City, Long Island, and Mid-Hudson is expected to grow by 8.1 percent, 16.7 percent, and 14.4 percent, respectively between 1995 and 2020.

Projected labor force by county represents a key input to the journey-to-work projections and is shown in Table 2-11. As shown in this table, labor force in the region is expected to grow from 10.4 million in 1995 to 12.8 million in 2020, an increase of 22.4 percent. The fact that the percentage growth in labor force is 70 percent higher than the growth rate for population suggests that the labor force participation rates are expected to continue to grow between 1995 and 2020. The labor force residing in New York City, Long Island, and Mid-Hudson is expected to grow by 13.8 percent, 29.5 percent, and 25.4 percent, respectively between 1995 and 2020.

Projected total employment by county is presented in Table 2-12. As shown in this table, total employment in the region is expected to grow from 10.5 million in 1995 to 13.0 million in 2020, an increase of 23.8 percent. Total regional employment is very similar in magnitude to the projected total labor force. The distribution among counties, however, is different and represents the difference between place of residence and place of employment for all workers. Total employment in Manhattan (New York County) is expected to grow from 2.3 million in 1990 to 2.7 million in 2020, an increase of 18.6 percent. Employment in all of New York City, Long Island, and Mid-Hudson is expected to grow by 18.2 percent, 30.1 percent, and 27.4 percent, respectively between 1995 and 2020.

Payroll employment represents those employees recorded on the payroll of a company and excludes sole proprietors. Projected payroll employment by county is presented in Table 2-13. As shown in this table, payroll employment in the region is expected to grow from 8.9 million in 1990 to 10.7 million in 2020, an increase of 20.7 percent. The fact that payroll employment is expected to grow less rapidly than total employment represents expectations that an increasing share of all employment will be sole proprietor employment. Payroll employment in Manhattan (New York County) is expected to grow from 2.1 million in 1990 to 2.4 million in 2020, an increase of 14.4 percent.

Table 2-10 Population Projections by County**(Population in 1,000s)**

County	1970	1980	1990	1995	2000	2005	2010	2015	2020
Bronx	1,471.7	1,169.0	1,203.8	1,192.6	1,203.8	1,223.4	1,240.3	1,260.0	1,289.8
Kings	2,602.0	2,231.0	2,300.7	2,275.7	2,285.5	2,300.8	2,333.7	2,370.0	2,412.4
New York	1,539.2	1,428.3	1,487.5	1,510.0	1,520.4	1,540.8	1,556.7	1,565.2	1,575.0
Queens	1,986.5	1,891.3	1,951.6	1,970.3	1,999.0	2,029.4	2,062.4	2,124.0	2,189.2
Richmond	295.4	352.0	379.0	400.0	413.7	428.4	441.5	455.0	475.0
NEW YORK CITY	7,894.8	7,071.6	7,322.6	7,348.6	7,422.4	7,522.8	7,634.6	7,774.2	7,941.4
Nassau	1,428.1	1,321.6	1,287.3	1,302.3	1,318.8	1,329.6	1,349.8	1,379.9	1,433.6
Suffolk	1,125.0	1,284.2	1,321.9	1,347.1	1,367.3	1,423.3	1,495.2	1,571.0	1,658.1
LONG ISLAND	2,553.1	2,605.8	2,609.2	2,649.4	2,686.1	2,752.9	2,845.0	2,950.9	3,091.7
Dutchess	222.3	245.1	259.5	259.8	263.6	278.4	289.9	301.1	315.6
Orange	221.7	259.6	307.6	319.5	336.9	361.5	384.7	407.1	431.5
Putnam	56.7	77.2	83.9	89.2	91.8	95.2	98.8	102.3	106.3
Rockland	229.9	259.5	265.5	274.8	280.0	286.9	295.5	305.3	315.0
Sullivan	52.6	65.2	69.3	70.0	71.0	74.9	79.0	83.2	87.7
Ulster	141.2	158.2	165.3	165.9	169.2	173.1	177.1	186.6	200.1
Westchester	894.1	866.6	874.9	885.6	891.0	892.9	897.7	900.0	905.0
MID-HUDSON	1,818.5	1,931.4	2,026.0	2,064.8	2,103.5	2,162.9	2,222.7	2,285.6	2,361.2
NY SUBURBS	4,371.6	4,537.2	4,635.2	4,714.2	4,789.6	4,915.8	5,067.7	5,236.5	5,452.9
NY METRO	12,266.4	11,608.8	11,957.8	12,062.8	12,212.0	12,438.6	12,702.3	13,010.7	13,394.3
Bergen	898.0	845.4	825.4	846.9	847.6	851.2	857.3	858.9	859.2
Essex	930.0	851.3	778.2	770.1	777.8	782.2	782.4	779.9	779.7
Hudson	609.3	557.0	553.1	556.0	567.9	588.1	612.5	638.4	652.1
Hunterdon	69.7	87.4	107.8	117.9	127.3	136.8	146.4	156.0	165.6
Mercer	304.0	307.9	325.8	330.8	343.5	361.3	383.1	400.4	411.7
Middlesex	583.8	595.9	671.8	701.5	729.6	763.9	797.5	838.8	889.6
Monmouth	459.4	503.2	553.1	586.6	601.6	633.1	656.6	680.1	703.6
Morris	383.5	407.6	421.4	445.5	460.4	460.4	460.5	465.2	475.2
Ocean	208.5	346.0	433.2	466.5	508.5	559.9	606.9	653.9	703.5
Passaic	460.8	447.6	453.1	463.8	463.6	463.5	463.4	463.3	463.2
Somerset	198.4	203.1	240.3	267.7	288.7	292.0	312.3	348.6	371.1
Sussex	77.5	116.1	130.9	140.6	149.7	157.6	167.2	178.1	185.2
Union	543.1	504.1	493.8	499.0	502.0	502.5	503.8	515.5	523.1
Warren	73.9	84.4	91.6	96.7	106.3	115.0	122.9	131.2	140.8
NEW JERSEY	5,799.9	5,857.0	6,079.5	6,289.6	6,474.5	6,667.5	6,872.8	7,108.3	7,323.6
Fairfield	792.8	807.1	827.6	838.4	846.6	877.8	906.3	945.5	978.1
Litchfield	144.1	156.8	174.1	181.0	190.6	200.4	211.6	223.2	241.0
New Haven	744.9	761.3	804.2	807.6	823.3	839.2	857.5	876.3	903.7
CONNECTICUT	1,681.8	1,725.2	1,805.9	1,827.0	1,860.5	1,917.4	1,975.4	2,045.0	2,122.8
REGION	19,748.1	19,191.0	19,843.2	20,179.4	20,547.0	21,023.5	21,550.5	22,164.0	22,840.7

Source: Urbanomics (9/18/95)

Table 2-11 Labor Force Projections by County

(Labor Force in 1,000s)

County	1970	1980	1990	1995	2000	2005	2010	2015	2020
Bronx	552.4	443.9	501.7	483.5	476.1	471.9	500.7	521.4	554.6
Kings	1,012.4	902.3	1,036.0	1,009.3	991.4	1,028.0	1,065.9	1,101.5	1,139.4
New York	741.7	754.1	837.2	833.2	817.2	858.3	882.2	911.1	910.2
Queens	908.9	907.4	1,015.7	1,010.1	1,001.9	1,049.8	1,082.9	1,115.1	1,169.6
Richmond	115.3	153.6	189.2	193.4	195.6	212.8	227.8	232.5	242.0
NEW YORK CITY	3,330.7	3,161.3	3,579.8	3,529.5	3,482.2	3,620.8	3,759.5	3,881.6	4,015.8
Nassau	585.5	654.8	690.1	719.1	741.3	766.2	795.1	822.2	851.1
Suffolk	403.2	573.8	698.7	700.0	721.8	770.4	838.9	909.8	986.7
LONG ISLAND	988.7	1,228.6	1,388.8	1,419.1	1,463.1	1,536.6	1,634.0	1,732.0	1,837.8
Dutchess	84.9	112.2	133.5	131.2	134.4	137.6	145.1	153.0	165.9
Orange	83.0	111.5	150.0	171.4	188.9	212.4	226.8	242.4	253.7
Putnam	20.7	35.9	46.9	51.0	52.9	55.7	59.3	62.3	65.6
Rockland	86.6	125.0	141.4	149.6	156.8	165.0	174.2	181.8	185.2
Sullivan	21.1	27.3	31.8	37.5	36.8	39.5	42.7	45.7	48.8
Ulster	54.8	72.4	84.4	86.2	88.7	97.0	101.7	109.0	118.3
Westchester	383.1	433.7	468.4	447.6	449.5	456.1	476.3	489.4	510.3
MID-HUDSON	734.2	918.0	1,056.4	1,074.5	1,108.0	1,163.3	1,226.1	1,283.6	1,347.8
NY SUBURBS	1,722.9	2,146.6	2,445.2	2,493.6	2,571.1	2,699.9	2,860.1	3,015.6	3,185.6
NY METRO	5,053.6	5,307.9	6,025.0	6,023.1	6,053.3	6,320.7	6,619.6	6,897.2	7,201.4
Bergen	397.9	442.2	456.7	463.9	479.3	505.1	516.8	517.1	510.6
Essex	392.0	391.6	399.9	407.6	428.9	450.2	469.8	476.3	489.6
Hudson	267.3	262.8	294.8	315.2	321.8	338.2	360.7	382.9	388.3
Hunterdon	28.3	42.6	60.1	65.3	73.2	79.7	88.1	96.1	99.9
Mercer	132.1	151.6	175.5	163.9	172.3	180.6	193.7	208.2	219.7
Middlesex	247.4	307.6	379.6	404.6	440.8	469.5	506.3	532.4	567.5
Monmouth	169.8	230.4	290.2	302.4	319.3	345.6	368.9	395.0	407.5
Morris	157.1	209.0	243.1	235.3	256.9	263.1	269.7	280.2	288.4
Ocean	69.1	131.7	192.8	223.6	223.0	247.1	266.6	295.7	323.8
Passaic	201.1	215.0	242.9	257.9	263.3	267.2	277.7	289.3	290.7
Somerset	83.4	106.5	141.5	150.1	160.0	165.6	176.2	199.7	214.6
Sussex	30.3	54.8	70.5	81.3	86.1	89.1	96.8	105.1	107.0
Union	242.3	256.9	268.6	290.5	304.1	306.9	315.1	324.1	322.0
Warren	30.2	39.4	47.9	55.3	58.0	63.8	69.4	75.1	79.7
NEW JERSEY	2,448.3	2,842.1	3,264.1	3,416.9	3,587.0	3,771.7	3,975.8	4,177.2	4,309.3
Fairfield	340.1	404.7	455.0	457.8	462.5	494.8	526.8	561.7	573.3
Litchfield	62.2	79.5	98.3	102.6	109.9	116.5	124.1	128.5	144.6
New Haven	321.6	375.5	432.5	430.5	452.8	474.2	495.7	516.7	542.5
CONNECTICUT	723.9	859.7	985.8	990.9	1,025.2	1,085.5	1,146.6	1,206.9	1,260.4
REGION	8,225.8	9,009.7	10,274.9	10,430.9	10,665.5	11,177.9	11,742.0	12,281.3	12,771.1

Source: Urbanomics (9/21/95)

Table 2-12 Total Employment Projections by County

(Employment in 1,000s)

County	1970	1980	1990	1995	2000	2005	2010	2015	2020
Bronx	251.3	217.0	245.6	250.6	258.7	266.0	278.4	292.0	303.3
Kings	631.8	516.4	540.4	559.1	557.6	554.4	568.4	585.3	611.8
New York	2,550.3	2,277.6	2,455.2	2,276.9	2,378.3	2,491.5	2,580.4	2,638.4	2,701.4
Queens	586.0	536.7	618.6	598.8	613.8	635.8	663.7	698.2	731.8
Richmond	47.1	66.4	97.6	101.1	105.6	109.2	114.0	120.1	125.8
NEW YORK CITY	4,066.5	3,614.1	3,957.4	3,786.5	3,914.0	4,056.9	4,204.9	4,334.0	4,474.1
Nassau	575.2	661.0	729.6	724.6	757.2	786.9	812.4	832.6	854.6
Suffolk	287.4	432.2	590.5	586.1	600.1	642.0	704.1	770.3	850.4
LONG ISLAND	862.6	1,093.2	1,320.1	1,310.7	1,357.3	1,428.9	1,516.5	1,602.9	1,705.2
Dutchess	92.1	110.2	139.5	123.9	134.9	146.8	155.3	159.4	163.5
Orange	80.3	95.5	127.8	135.9	151.7	162.0	173.8	186.2	198.6
Putnam	11.7	17.0	25.6	27.1	30.1	32.4	34.7	37.6	42.9
Rockland	73.1	98.1	122.2	123.2	128.5	135.5	142.6	150.3	159.3
Sullivan	22.8	26.8	31.5	30.6	32.5	34.1	35.7	37.7	40.6
Ulster	48.8	58.3	75.6	72.6	80.3	84.8	88.7	93.1	99.3
Westchester	363.2	419.5	479.3	452.5	461.1	474.0	490.1	507.2	526.7
MID-HUDSON	692.0	825.4	1,001.5	965.8	1,019.1	1,069.6	1,120.9	1,171.5	1,230.9
NY SUBURBS	1,554.6	1,918.6	2,321.6	2,276.5	2,376.4	2,498.5	2,637.4	2,774.4	2,936.1
NY METRO	5,621.1	5,532.7	6,279.0	6,063.0	6,290.4	6,555.4	6,842.3	7,108.4	7,410.2
Bergen	370.0	454.2	528.1	522.5	541.7	558.5	578.1	601.6	624.8
Essex	452.0	427.7	425.1	412.8	429.8	437.5	442.0	446.7	452.3
Hudson	278.9	247.9	272.2	273.5	280.9	298.6	315.1	331.4	349.8
Hunterdon	23.9	32.3	51.2	60.5	65.2	72.0	81.4	91.6	99.4
Mercer	147.5	176.4	222.5	225.9	230.5	242.8	259.3	279.0	297.3
Middlesex	235.2	312.4	407.0	418.8	440.0	471.8	506.5	531.8	551.4
Monmouth	141.0	194.8	262.3	274.9	282.2	299.8	323.6	347.4	359.6
Morris	124.9	212.0	293.9	298.1	318.7	340.6	362.1	383.6	405.3
Ocean	53.9	96.4	143.9	155.5	170.4	181.2	194.5	212.1	226.6
Passaic	203.1	208.8	222.5	214.3	214.4	219.5	228.8	234.8	233.4
Somerset	68.6	108.9	166.0	186.8	205.4	222.5	238.3	253.8	266.1
Sussex	20.2	29.9	41.1	42.2	44.3	47.6	51.2	56.2	60.4
Union	299.0	291.7	300.1	291.6	299.5	312.8	324.1	333.2	334.8
Warren	29.5	34.7	41.6	42.0	45.3	48.5	50.9	53.3	56.8
NEW JERSEY	2,447.7	2,828.1	3,377.5	3,419.4	3,568.3	3,753.7	3,955.9	4,156.5	4,318.0
Fairfield	345.4	434.3	503.5	505.9	527.1	558.1	580.9	598.0	613.2
Litchfield	51.4	67.2	81.9	84.6	91.3	98.4	105.8	113.8	123.6
New Haven	330.6	367.8	431.5	409.7	420.2	440.0	464.2	493.0	513.9
CONNECTICUT	727.4	869.3	1,016.9	1,000.2	1,038.6	1,096.5	1,150.9	1,204.8	1,250.7
REGION	8,796.2	9,230.1	10,673.4	10,482.6	10,897.3	11,405.6	11,949.1	12,469.7	12,978.9

Source: Urbanomics (9/20/95)

Table 2-13 Payroll Employment Projections by County**(Employment in 1,000s)**

County	1970	1980	1990	1995	2000	2005	2010	2015	2020
Bronx	216.8	192.4	218.0	217.8	224.3	227.3	234.3	246.0	262.8
Kings	537.6	434.7	459.2	461.3	454.9	450.3	466.8	482.7	509.7
New York	2,454.5	2,171.4	2,282.1	2,073.2	2,161.7	2,256.1	2,322.5	2,356.0	2,371.1
Queens	499.3	450.4	527.0	492.9	503.3	519.8	540.9	566.1	601.5
Richmond	37.3	52.9	79.8	82.3	87.0	90.4	94.9	100.1	106.5
NEW YORK CITY	3,745.5	3,301.8	3,566.1	3,327.5	3,431.2	3,543.9	3,659.4	3,750.9	3,851.6
Nassau	486.5	554.0	621.9	586.7	608.5	634.4	658.2	674.9	692.1
Suffolk	239.1	361.5	501.7	481.9	488.3	519.3	567.3	615.7	672.4
LONG ISLAND	725.6	915.5	1,123.6	1,068.6	1,096.8	1,153.7	1,225.5	1,290.6	1,364.5
Dutchess	82.5	97.6	121.1	103.0	113.3	123.7	130.5	132.5	134.7
Orange	68.7	80.9	108.0	112.5	124.9	132.0	140.6	149.8	159.0
Putnam	8.8	12.3	18.9	19.3	21.3	22.7	24.0	25.6	28.4
Rockland	62.4	81.5	102.0	99.8	104.3	110.9	116.5	121.9	127.1
Sullivan	18.3	21.5	25.7	24.3	25.8	26.9	27.8	28.9	30.6
Ulster	41.6	48.7	61.8	56.6	63.2	67.0	70.2	73.3	77.8
Westchester	304.0	352.2	406.7	372.8	378.5	390.5	405.9	419.2	431.2
MID-HUDSON	586.3	694.7	844.2	788.3	831.3	873.7	915.5	951.2	988.8
NY SUBURBS	1,311.9	1,610.2	1,967.8	1,856.9	1,928.1	2,027.4	2,141.0	2,241.8	2,353.3
NY METRO	5,057.4	4,912.0	5,533.9	5,184.4	5,359.3	5,571.3	5,800.4	5,992.7	6,204.9
Bergen	324.0	394.9	452.5	436.2	451.2	461.3	471.0	482.6	495.7
Essex	413.7	392.0	379.5	363.1	376.4	381.9	385.5	388.8	392.9
Hudson	259.5	227.8	246.0	242.9	247.8	262.3	274.6	286.0	299.7
Hunterdon	19.0	25.4	37.8	44.6	47.2	51.9	58.7	65.8	71.5
Mercer	135.4	162.2	198.0	197.3	200.0	210.2	223.2	238.7	252.3
Middlesex	217.2	287.9	362.5	365.7	381.2	408.3	437.9	459.0	475.5
Monmouth	119.9	165.0	217.9	222.6	228.1	242.1	260.3	278.6	287.4
Morris	108.5	187.6	256.1	253.3	268.4	284.9	301.2	317.6	334.2
Ocean	42.5	77.3	113.4	120.6	132.3	140.3	150.7	164.6	175.5
Passaic	184.4	189.0	195.5	183.5	181.0	183.3	189.7	193.9	193.0
Somerset	59.8	96.5	142.8	158.4	173.8	187.5	199.5	211.0	219.4
Sussex	16.1	23.2	29.7	28.6	29.1	30.7	32.6	35.8	39.1
Union	273.1	266.2	265.2	250.6	254.1	263.3	270.5	276.1	276.4
Warren	25.2	29.4	34.2	33.3	35.8	38.3	40.2	41.9	44.6
NEW JERSEY	2,198.3	2,524.4	2,931.1	2,900.7	3,006.4	3,146.3	3,295.6	3,440.4	3,557.2
Fairfield	302.9	372.4	419.9	405.3	414.9	437.3	452.8	464.6	475.2
Litchfield	42.9	54.4	63.8	63.6	68.1	72.8	77.6	82.9	89.6
New Haven	298.8	326.3	372.1	344.9	349.5	362.9	380.5	402.7	416.5
CONNECTICUT	644.6	753.1	855.8	813.8	832.5	873.0	910.9	950.2	981.3
REGION	7,900.3	8,189.5	9,320.8	8,898.9	9,198.2	9,590.6	10,006.9	10,383.3	10,743.4

Source: Urbanomics (9/29/95)

2.7.2 2.8.2 NYMTC Journey-to-Work Forecasts

The NYMTC Journey-to-Work forecasts represent existing and projected county-to-county flows of journey-to-work travel. These forecasts were prepared by Urbanomics for NYMTC using existing journey-to-work travel patterns from the 1990 Census and projections of county-level labor force and employment. The growth rates implied by a comparison of 1995 and 2010 journey-to-work travel were used to adjust 1995 work-related travel patterns to represent expected 2010 conditions. A similar adjustment was used to create the Year 2020 trip tables. The process used to develop the future year trip tables is described later in this chapter.

Table 2-14 presents the NYMTC County-to-County Journey-to-Work Forecasts for 1990. Tables 2-15, 2-16, and 2-17 present the forecasts for 1995, 2010, and 2020, respectively.

Table 2-14 1990 Journey-to-Work Flows

EMPLOYED LABOR FORCE WORKING IN:								
EMPLOYED LF RESIDING IN:	Fairfield	Litchfield	New Haven	Dutchess	Orange	Putnam	Rockland	Westchester
Fairfield	332,026	2,742	18,650	742	110	1,118	320	15,654
Litchfield	8,552	49,109	11,982	514	10	192	20	636
New Haven	46,961	7,772	299,143	87	27	69	20	757
CONNECTICUT	387,539	59,623	329,775	1,343	147	1,379	360	17,047
Bergen	859	-	101	78	234	22	5,475	5,005
Essex	163	-	5	-	41	-	370	504
Hudson	43	-	16	17	-	-	321	857
Hunterdon	19	-	2	-	8	-	-	10
Mercer	10	-	33	23	32	-	5	65
Middlesex	45	-	26	37	31	7	85	290
Monmouth	64	-	7	9	46	-	50	280
Morris	116	-	34	6	9	-	192	297
Ocean	10	-	3	-	-	-	51	102
Passaic	171	-	25	16	302	-	1,088	701
Somerset	32	-	11	-	-	-	19	53
Sussex	-	-	14	-	771	2	84	85
Union	86	-	20	12	13	-	112	249
Warren	-	-	-	-	-	-	18	21
NEW JERSEY	1,618	-	297	198	1,487	31	7,870	8,519
Dutchess	1,345	982	171	93,079	2,287	3,135	365	11,270
Orange	463	6	32	5,634	91,447	276	8,710	4,421
Putnam	2,476	91	50	1,466	364	11,764	278	19,564
Rockland	827	14	20	238	1,287	74	70,648	10,074
Sullivan	2	-	-	167	4,110	-	173	128
Ulster	75	-	51	9,971	6,559	58	365	614
Westchester	14,892	56	433	1,125	549	1,678	3,274	268,758
MID-HUDSON	20,080	1,149	757	111,680	106,603	16,985	83,813	314,829
Nassau	675	-	77	125	192	20	240	3,983
Suffolk	338	19	80	95	244	65	67	1,389
LONG ISLAND	1,013	19	157	220	436	85	307	5,372
Bronx	1,432	-	22	157	140	122	1,072	26,390
Kings	438	-	68	120	132	39	942	5,296
Manhattan	9	23	121	212	133	106	1,198	8,677
Queens	1,109	11	85	329	102	58	1,170	10,339
Richmond	25	-	-	19	26	9	103	809
NEW YORK CITY	3,013	34	296	837	533	334	4,485	51,511
RES IN REGION	413,263	60,825	331,282	114,278	109,206	18,814	96,835	397,278
RES OUT WK IN	7,854	5,012	27,506	3,868	2,996	175	641	3,588
TOT TRIP-BASED	421,117	65,837	358,788	118,146	112,202	18,989	97,476	400,866

(Continued)

Table 2-14 1990 Journey-to-Work Flows
(Continued)

EMPLOYED LF RESIDING IN:	EMPLOYED LABOR FORCE WORKING IN:							Region
	Nassau	Suffolk	Bronx	Kings	New York	Queens	Richmond	
Fairfield	667	163	1,235	517	24,285	1,481	18	399,728
Litchfield	29	36	71	26	984	163	3	72,327
New Haven	83	7	80	141	1,307	252	17	356,723
CONNECTICUT	779	206	1,386	684	26,576	1,896	38	828,778
Bergen	1,354	214	6,130	3,830	60,013	3,681	1,183	88,179
Essex	578	110	777	1,929	25,750	1,303	626	32,156
Hudson	1,066	186	1,628	3,026	52,292	1,774	2	61,228
Hunterdon	16	3	59	48	937	65	189	1,356
Mercer	44	11	78	297	4,963	134	114	5,809
Middlesex	442	102	575	2,817	24,030	997	2,013	31,497
Monmouth	361	74	150	2,717	19,050	971	2,334	26,113
Morris	173	69	356	611	9,385	468	6	11,722
Ocean	102	41	104	438	2,870	224	2	3,947
Passaic	214	62	562	815	7,796	541	9	12,302
Somerset	95	40	54	343	5,064	143	360	6,214
Sussex	26	8	59	224	1,474	172	66	2,985
Union	354	56	203	1,237	14,414	612	18	17,386
Warren	23	-	38	18	417	40	26	601
NEW JERSEY	4,848	976	10,773	18,350	228,455	11,125	6,948	301,495
Dutchess	147	50	633	270	2,814	244	14	116,806
Orange	291	48	1,976	794	7,032	648	85	121,863
Putnam	129	43	1,647	326	3,418	391	58	42,065
Rockland	467	126	6,704	1,586	17,369	1,343	246	111,023
Sullivan	57	47	55	130	465	115	20	5,469
Ulster	58	23	136	116	925	140	31	19,122
Westchester	2,149	434	27,227	4,179	80,628	6,418	836	412,636
MID-HUDSON	3,298	771	38,378	7,401	112,651	9,299	1,290	828,984
Nassau	370,979	48,205	6,216	28,430	97,205	68,213	1,066	625,626
Suffolk	98,515	455,018	3,072	9,730	38,505	26,605	379	634,121
LONG ISLAND	469,494	503,223	9,288	38,160	135,710	94,818	1,445	1,259,747
Bronx	3,035	690	173,214	16,283	170,318	18,450	944	412,269
Kings	10,080	2,253	10,641	436,222	343,762	53,832	5,824	869,649
Manhattan	6,118	1,739	21,043	26,955	594,659	20,160	1,934	683,087
Queens	58,565	7,710	20,677	84,350	344,001	351,726	4,036	884,268
Richmond	962	205	1,116	25,256	54,292	3,894	72,972	159,688
NEW YORK CITY	78,760	12,597	226,691	589,066	1,507,032	448,062	85,710	3,008,961
RES IN REGION	557,179	517,773	286,516	653,661	2,010,424	565,200	95,431	6,227,965
RES OUT WK IN	4,459	2,298	1,786	6,623	19,493	7,081	3,742	97,122
TOT TRIP-BASED	561,638	520,071	288,302	660,284	2,029,917	572,281	99,173	6,325,087

Table 2-15 1995 Journey-to-Work Flows

EMPLOYED LABOR FORCE WORKING IN:								
EMPLOYED LF RESIDING IN:	Fairfield	Litchfield	New Haven	Dutchess	Orange	Putnam	Rockland	Westchester
Fairfield	334,008	2,700	17,052	587	102	1,171	322	16,734
Litchfield	9,406	51,725	11,756	410	10	220	22	748
New Haven	50,046	8,028	292,547	73	27	76	21	850
CONNECTICUT	393,460	62,452	321,355	1,071	139	1,467	366	18,332
Bergen	889	-	95	63	223	24	5,666	5,484
Essex	173	-	5	-	40	-	393	566
Hudson	47	-	16	14	-	-	350	987
Hunterdon	18	-	2	-	7	-	-	10
Mercer	8	-	23	15	24	-	4	55
Middlesex	47	-	25	31	30	8	88	317
Monmouth	65	-	6	7	43	-	51	302
Morris	113	-	30	5	8	-	187	307
Ocean	12	-	3	-	-	-	59	125
Passaic	195	-	26	14	313	-	1,236	836
Somerset	31	-	10	-	-	-	19	55
Sussex	-	-	16	-	859	3	103	109
Union	96	-	21	11	13	-	125	289
Warren	-	-	-	-	-	-	20	25
NEW JERSEY	1,693	-	278	161	1,562	34	8,301	9,467
Dutchess	1,555	1,083	181	82,719	2,392	3,734	421	13,692
Orange	559	7	35	5,153	98,992	343	10,488	5,600
Putnam	2,496	89	45	1,117	336	12,418	281	21,135
Rockland	836	14	18	186	1,197	78	71,477	10,860
Sullivan	3	-	-	205	5,818	-	279	212
Ulster	92	-	57	9,235	7,212	73	448	793
Westchester	12,377	48	318	713	434	1,516	2,780	246,490
MID-HUDSON	17,919	1,241	656	99,327	116,382	18,162	86,174	298,782
Nassau	636	-	64	89	167	20	227	4,057
Suffolk	288	16	59	59	193	59	57	1,308
LONG ISLAND	924	16	123	148	360	79	284	5,365
Bronx	1,123	-	14	85	102	105	848	23,385
Kings	340	-	44	62	94	33	739	4,684
Manhattan	8	20	95	144	110	100	1,071	8,406
Queens	961	10	64	209	82	54	1,019	9,857
Richmond	21	-	-	11	20	8	87	758
NEW YORK CITY	2,453	30	217	511	409	300	3,764	47,090
RES IN REGION	416,449	63,740	322,629	101,217	118,851	20,043	98,890	379,036
RES OUT WK IN	7,174	4,600	23,450	3,075	2,646	166	587	3,447
TOT TRIP-BASED	423,623	68,339	346,079	104,293	121,497	20,208	99,477	382,482

(Continued)

Table 2-15 1995 Journey-to-Work Flows
(Continued)

EMPLOYED LF RESIDING IN:	EMPLOYED LABOR FORCE WORKING IN:							
	Nassau	Suffolk	Bronx	Kings	New York	Queens	Richmond	Region
Fairfield	709	180	1,382	574	25,505	1,586	20	402,634
Litchfield	34	44	87	31	1,137	190	4	75,823
New Haven	93	8	93	161	1,447	282	20	353,771
CONNECTICUT	836	232	1,561	766	28,088	2,058	44	832,227
Bergen	1,477	241	6,982	4,317	64,693	4,028	1,372	95,553
Essex	647	127	901	2,209	28,477	1,456	740	35,734
Hudson	1,227	220	1,930	3,536	59,374	2,030	2	69,734
Hunterdon	16	3	64	52	941	67	207	1,387
Mercer	36	10	74	284	6,223	118	108	6,983
Middlesex	481	114	650	3,152	25,870	1,087	2,313	34,212
Monmouth	388	82	169	3,032	20,211	1,048	2,673	28,078
Morris	177	74	387	660	9,516	486	7	11,955
Ocean	125	51	129	531	3,472	270	3	4,779
Passaic	256	76	680	970	9,190	637	11	14,440
Somerset	98	43	59	372	5,179	149	398	6,413
Sussex	34	10	75	279	1,874	216	86	3,665
Union	412	66	240	1,438	16,570	704	22	20,006
Warren	27	-	45	21	487	47	32	704
NEW JERSEY	5,402	1,118	12,383	20,853	252,077	12,342	7,972	333,643
Dutchess	179	62	780	327	3,378	292	18	110,815
Orange	370	62	2,520	991	8,812	806	111	134,850
Putnam	138	48	1,874	367	3,619	423	67	44,454
Rockland	500	140	7,581	1,777	18,377	1,450	283	114,773
Sullivan	97	78	86	196	772	182	33	7,962
Ulster	75	30	176	147	1,182	177	41	19,741
Westchester	1,954	424	27,710	4,297	76,035	6,100	866	382,062
MID-HUDSON	3,314	845	40,727	8,101	112,176	9,431	1,419	814,656
Nassau	373,441	51,157	6,783	30,868	96,676	70,175	1,181	635,541
Suffolk	90,901	452,299	3,202	10,150	35,112	25,630	400	619,734
LONG ISLAND	464,342	503,456	9,985	41,018	131,789	95,805	1,580	1,255,275
Bronx	2,615	654	174,991	16,536	144,971	16,913	963	383,303
Kings	8,659	2,137	10,789	444,560	291,474	49,313	5,965	818,896
Manhattan	5,833	1,764	22,166	28,364	560,801	19,866	2,061	650,810
Queens	54,793	7,743	21,708	88,543	318,051	342,367	4,288	849,748
Richmond	882	203	1,164	26,377	49,179	3,739	77,048	159,499
NEW YORK CITY	72,781	12,502	230,819	604,380	1,364,476	432,199	90,325	2,862,255
RES IN REGION	546,674	518,152	295,476	675,119	1,888,605	551,835	101,342	6,098,057
RES OUT WK IN	4,237	2,272	1,813	6,733	18,416	6,891	3,820	89,327
TOT TRIP-BASED	550,911	520,424	297,289	681,852	1,907,021	558,726	105,162	6,187,384

Table 2-16 2010 Journey-to-Work Flows

EMPLOYED LABOR FORCE WORKING IN:								
EMPLOYED LF RESIDING IN:	Fairfield	Litchfield	New Haven	Dutchess	Orange	Putnam	Rockland	Westchester
Fairfield	377,532	3,245	19,033	938	113	1,547	365	19,379
Litchfield	10,897	64,970	13,431	744	11	309	26	893
New Haven	57,516	9,778	332,397	118	30	102	25	999
CONNECTICUT	445,945	77,993	364,860	1,800	154	1,958	415	21,271
Bergen	991	-	105	100	244	31	6,327	6,274
Essex	202	-	6	-	45	-	458	673
Hudson	53	-	18	23	-	-	394	1,141
Hunterdon	21	-	2	-	8	-	-	12
Mercer	8	-	24	21	25	-	4	59
Middlesex	54	-	28	49	34	10	102	374
Monmouth	75	-	7	12	49	-	59	358
Morris	119	-	31	7	9	-	199	334
Ocean	12	-	3	-	-	-	63	137
Passaic	214	-	28	22	339	-	1,364	946
Somerset	33	-	10	-	-	-	20	59
Sussex	-	-	18	-	954	3	117	127
Union	100	-	21	15	14	-	131	312
Warren	-	-	-	-	-	-	22	28
NEW JERSEY	1,883	-	302	249	1,721	44	9,259	10,834
Dutchess	1,292	1,014	143	100,738	2,024	3,772	353	12,091
Orange	758	10	48	10,252	129,453	545	14,211	7,700
Putnam	2,727	106	48	1,822	361	16,211	307	23,837
Rockland	989	17	21	318	1,379	109	84,679	13,132
Sullivan	4	-	-	340	6,466	-	316	248
Ulster	86	-	52	12,939	6,744	83	421	779
Westchester	12,997	55	326	1,140	449	1,917	2,929	268,361
MID-HUDSON	18,853	1,201	639	127,549	146,877	22,636	103,216	326,147
Nassau	711	-	71	149	183	26	254	4,661
Suffolk	369	22	76	118	238	91	74	1,696
LONG ISLAND	1,080	22	147	267	421	117	327	6,357
Bronx	1,176	-	15	152	105	137	892	25,609
Kings	388	-	49	126	105	47	844	5,513
Manhattan	8	23	97	223	114	125	1,118	9,065
Queens	1,056	11	69	360	88	72	1,124	11,196
Richmond	27	-	-	24	25	13	112	983
NEW YORK CITY	2,656	35	229	884	437	393	4,090	52,366
RES IN REGION	470,416	79,251	366,177	130,750	149,609	25,148	117,308	416,975
RES OUT WK IN	6,264	4,326	19,958	3,319	2,363	162	516	3,123
TOT TRIP-BASED	476,680	83,577	386,135	134,069	151,972	25,310	117,824	420,097

(Continued)

Table 2-16 2010 Journey-to-Work Flows
(Continued)

EMPLOYED LF RESIDING IN:	EMPLOYED LABOR FORCE WORKING IN:							
	Nassau	Suffolk	Bronx	Kings	New York	Queens	Richmond	Region
Fairfield	805	197	1,526	592	29,936	1,769	22	456,998
Litchfield	40	49	98	32	1,379	217	4	93,098
New Haven	107	9	103	168	1,724	319	22	403,417
CONNECTICUT	952	254	1,727	793	33,039	2,305	48	953,513
Bergen	1,656	261	7,644	4,422	74,956	4,446	1,471	108,925
Essex	756	142	1,016	2,321	34,384	1,665	819	42,487
Hudson	1,387	240	2,130	3,633	69,504	2,258	3	80,781
Hunterdon	19	4	71	54	1,121	76	227	1,614
Mercer	39	10	77	284	6,828	124	111	7,614
Middlesex	559	128	729	3,312	30,987	1,236	2,552	40,157
Monmouth	451	92	190	3,177	24,299	1,193	2,947	32,909
Morris	189	76	408	659	10,465	514	7	13,016
Ocean	134	53	136	528	3,839	287	3	5,194
Passaic	283	81	740	987	10,526	698	12	16,241
Somerset	103	44	61	368	5,597	156	407	6,857
Sussex	38	11	84	290	2,207	242	94	4,186
Union	434	68	252	1,427	18,020	739	22	21,556
Warren	30	-	49	21	550	51	33	784
NEW JERSEY	6,079	1,210	13,587	21,481	293,281	13,684	8,707	382,321
Dutchess	152	53	708	283	2,979	257	15	125,876
Orange	502	79	3,189	1,145	12,361	1,050	139	181,443
Putnam	152	51	2,026	370	4,135	460	71	52,684
Rockland	594	159	8,636	1,878	22,583	1,678	316	136,491
Sullivan	110	86	97	202	912	205	36	9,019
Ulster	71	28	172	135	1,167	171	39	22,888
Westchester	2,070	435	29,124	4,230	83,765	6,420	887	415,105
MID-HUDSON	3,651	892	43,953	8,244	127,902	10,241	1,503	943,506
Nassau	419,490	55,193	7,424	31,451	112,706	77,499	1,263	711,081
Suffolk	116,139	541,264	3,807	11,062	46,625	31,354	466	753,401
LONG ISLAND	535,629	596,457	11,231	42,513	159,331	108,853	1,729	1,464,482
Bronx	2,769	667	184,121	16,122	161,125	17,804	982	411,676
Kings	9,908	2,318	11,910	450,178	350,198	55,138	6,399	893,122
Manhattan	6,123	1,798	23,173	27,827	611,464	20,762	2,101	704,020
Queens	60,659	8,228	23,497	89,026	366,818	373,320	4,525	940,048
Richmond	1,125	243	1,382	28,623	65,300	4,565	89,586	192,005
NEW YORK CITY	80,584	13,253	244,082	611,775	1,554,905	471,589	103,593	3,140,871
RES IN REGION	626,895	612,066	314,581	684,806	2,168,458	606,672	115,580	6,884,694
RES OUT WK IN	3,739	2,027	1,687	6,141	16,635	6,270	3,475	80,003
TOT TRIP-BASED	630,634	614,093	316,268	690,947	2,185,093	612,942	119,055	6,964,697

Table 2-17 2020 Journey-to-Work Flows

EMPLOYED LF RESIDING IN:	EMPLOYED LABOR FORCE WORKING IN:							
	Fairfield	Litchfield	New Haven	Dutchess	Orange	Putnam	Rockland	Westchester
Fairfield	403,880	3,708	22,501	831	128	1,799	434	21,285
Litchfield	11,925	76,940	16,651	646	13	371	32	1,007
New Haven	58,168	10,632	368,344	99	32	112	28	1,042
CONNECTICUT	473,972	91,280	407,497	1,577	173	2,282	493	23,334
Bergen	920	-	106	77	243	31	6,548	6,064
Essex	208	-	6	-	50	-	525	715
Hudson	54	-	20	20	-	-	452	1,209
Hunterdon	22	-	2	-	9	-	-	13
Mercer	9	-	28	19	28	-	5	65
Middlesex	60	-	35	46	39	12	126	428
Monmouth	85	-	9	11	57	-	73	410
Morris	120	-	34	6	9	-	220	345
Ocean	16	-	5	-	-	-	88	174
Passaic	216	-	31	19	362	-	1,527	984
Somerset	39	-	13	-	-	-	25	71
Sussex	-	-	20	-	1,012	4	130	131
Union	102	-	24	13	15	-	147	327
Warren	-	-	-	-	-	-	26	30
NEW JERSEY	1,849	-	334	210	1,824	47	9,893	10,965
Dutchess	1,717	1,395	217	108,792	2,766	5,357	522	16,131
Orange	802	11	56	8,850	145,769	633	16,869	8,412
Putnam	2,888	121	57	1,562	406	18,796	367	26,012
Rockland	960	18	23	254	1,431	116	92,124	13,237
Sullivan	4	-	-	314	7,747	-	400	288
Ulster	114	-	78	13,719	9,251	118	622	1,036
Westchester	13,406	61	380	943	494	2,173	3,422	286,062
MID-HUDSON	19,892	1,606	811	134,433	167,865	27,192	114,325	351,178
Nassau	725	-	81	123	199	30	292	4,920
Suffolk	397	26	92	101	273	107	90	1,882
LONG ISLAND	1,122	26	173	224	472	137	382	6,801
Bronx	1,254	-	18	124	121	162	1,104	28,232
Kings	393	-	58	96	116	54	1,000	5,831
Manhattan	8	25	107	179	120	136	1,248	9,308
Queens	1,073	13	79	290	96	80	1,302	11,807
Richmond	26	-	-	18	26	14	125	1,000
NEW YORK CITY	2,754	38	262	707	480	445	4,780	56,178
RES IN REGION	499,589	92,949	409,077	137,151	170,813	30,103	129,872	448,457
RES OUT WK IN	5,862	4,265	19,559	2,811	2,309	160	513	2,995
TOT TRIP-BASED	505,451	97,215	428,636	139,962	173,122	30,263	130,385	451,452

(Continued)

Table 2-17 2020 Journey-to-Work Flows
(Continued)

EMPLOYED LF RESIDING IN:	EMPLOYED LABOR FORCE WORKING IN:							
	Nassau	Suffolk	Bronx	Kings	New York	Queens	Richmond	Region
Fairfield	889	231	1,703	649	32,502	2,025	26	492,589
Litchfield	45	59	112	36	1,533	258	5	109,633
New Haven	112	10	111	178	1,774	348	24	441,015
CONNECTICUT	1,046	300	1,926	864	35,809	2,631	55	1,043,238
Bergen	1,595	272	7,743	4,458	71,169	4,539	1,537	105,303
Essex	805	162	1,107	2,493	36,016	1,851	925	44,863
Hudson	1,474	273	2,320	3,902	72,617	2,512	3	84,855
Hunterdon	20	4	78	58	1,191	85	257	1,739
Mercer	42	12	84	304	7,388	138	125	8,245
Middlesex	643	155	839	3,730	35,079	1,463	3,050	45,706
Monmouth	520	112	219	3,587	27,554	1,419	3,539	37,597
Morris	195	84	433	690	10,671	554	7	13,369
Ocean	173	72	172	646	4,875	378	3	6,602
Passaic	295	90	794	1,045	10,790	761	13	16,927
Somerset	125	56	73	426	6,704	193	504	8,228
Sussex	40	13	90	306	2,247	263	104	4,360
Union	456	76	270	1,512	18,642	807	25	22,415
Warren	33	-	54	23	593	57	38	855
NEW JERSEY	6,417	1,381	14,275	23,180	305,536	15,020	10,131	401,062
Dutchess	206	74	913	352	3,967	350	21	142,781
Orange	550	94	3,586	1,268	13,311	1,208	162	201,581
Putnam	167	60	2,256	405	4,452	526	82	58,156
Rockland	599	173	9,052	1,950	22,388	1,785	343	144,452
Sullivan	128	107	115	236	1,047	250	44	10,680
Ulster	97	40	224	170	1,545	234	54	27,301
Westchester	2,216	500	31,732	4,539	87,993	7,180	1,006	442,106
MID-HUDSON	3,963	1,049	47,878	8,919	134,703	11,533	1,713	1,027,059
Nassau	444,003	62,843	8,054	33,638	117,188	85,986	1,424	759,507
Suffolk	129,648	649,553	4,304	12,273	51,011	36,550	551	886,858
LONG ISLAND	573,652	712,397	12,358	45,911	168,200	122,536	1,975	1,646,365
Bronx	3,079	801	206,516	17,735	174,946	20,700	1,155	455,946
Kings	10,521	2,694	13,021	484,586	363,338	62,079	7,332	951,118
Manhattan	6,293	1,992	24,575	29,168	617,751	22,443	2,310	715,663
Queens	64,175	9,410	25,501	95,220	380,610	415,297	5,117	1,010,072
Richmond	1,145	270	1,468	30,055	65,196	4,943	99,163	203,449
NEW YORK CITY	85,213	15,167	271,081	656,764	1,601,840	525,462	115,078	3,336,248
RES IN REGION	670,290	730,294	347,518	735,637	2,246,087	677,181	128,952	7,453,971
RES OUT WK IN	3,572	2,032	1,672	6,088	15,770	6,220	3,497	77,326
TOT TRIP-BASED	673,863	732,326	349,190	741,726	2,261,857	683,401	132,449	7,531,297

2.7.3 MTA/AKRF Sub-County Forecasts of Population and Establishment Employment

Sub-county forecasts of population and employment are used to provide detail on where population and employment growth is expected to occur within each County. This data was assembled for each MTA Planning District (Planning Districts are shown in Figures 2-5, 2-6, and 2-7). Data on sub-county population and employment outside of Manhattan, Long Island City, and the Brooklyn CBD were obtained from the MTA Long Range Travel Forecast Study. Inside those areas, population and employment forecasts are based on an analysis of building vacancies and anticipated development conducted by AKRF.

Table 2-18 displays the resulting estimates of population and establishment employment. It should be noted that the MTA/AKRF forecasts of establishment employment are somewhat different from the official NYMTC county-level estimates of employment. This difference is due to the different original sources of information used to prepare the 1990 estimates of employment. The MTA/AKRF forecasts are based on information from the CTPP while the NYMTC forecasts are based on the Department of Labor's Bureau of Economic Analysis.

To assure that these models are faithful to the official, adopted NYMTC forecasts, the MTA RTF Model uses the MTA/AKRF forecasts of establishment employment solely as a means for disaggregating forecasted employment or journey-to-work travel from the county to the sub-county level.

Figure 2-5 MTA Transportation Planning Districts in Manhattan

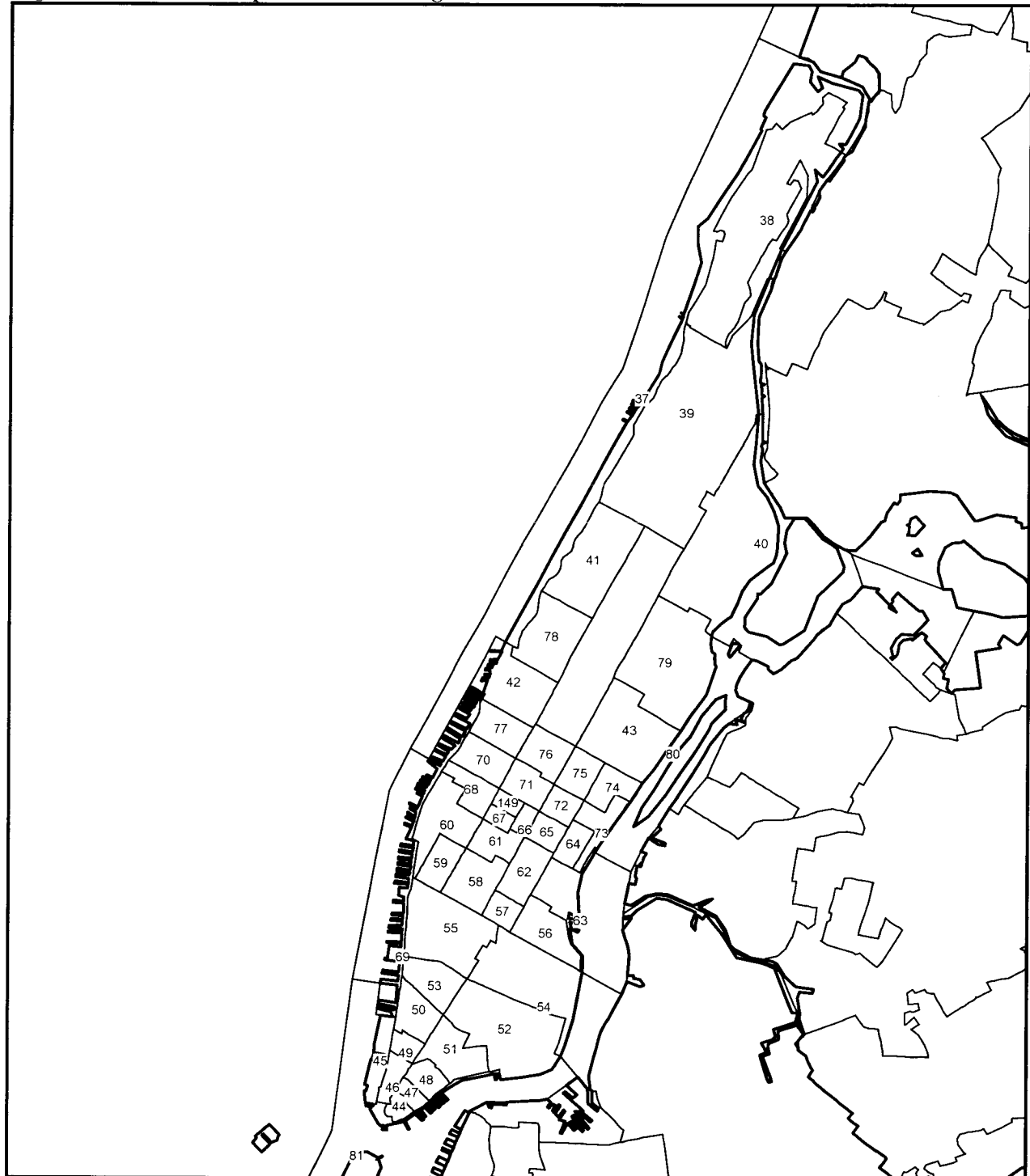


Figure 2-6 MTA Transportation Planning Districts in New York City Outside Manhattan

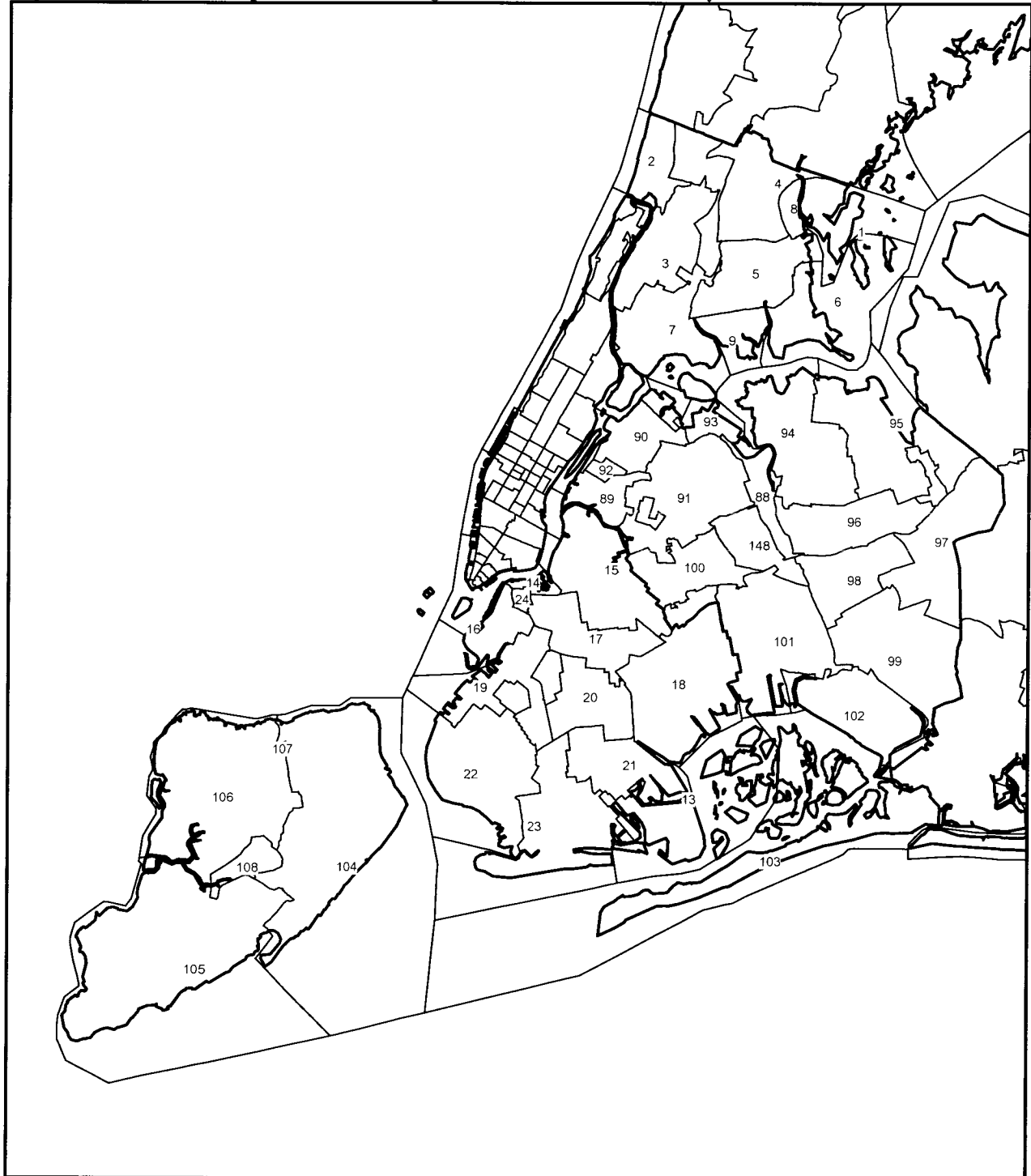


Figure 2-7 MTA Transportation Planning Districts in Region Outside New York City

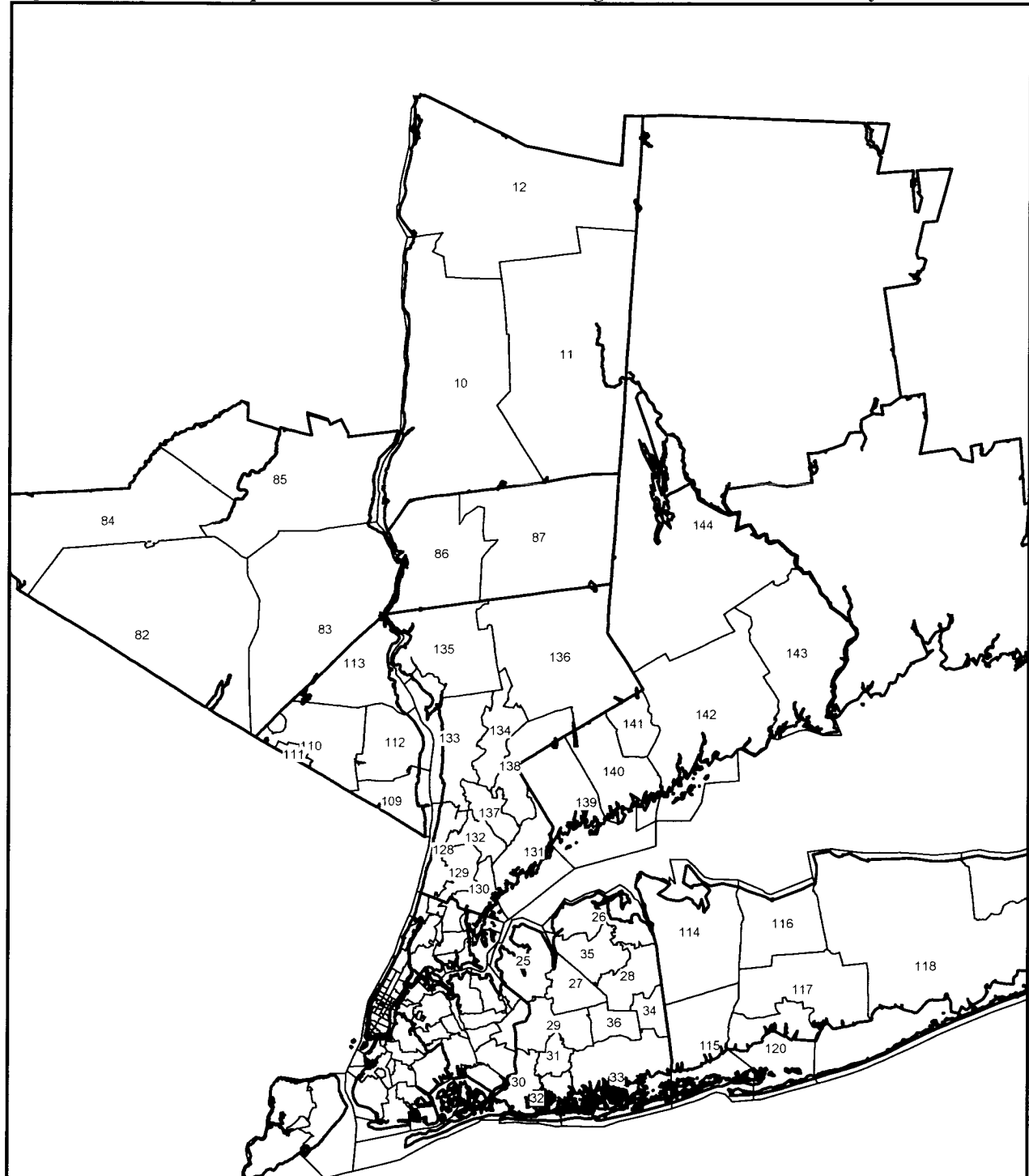


Table 2-18 MTA/AKRF Forecasts of Population and Employment by Sub-County Planning District

County	MTA PD#	Population			Establishment Employment		
		1995	2010	2020	1995	2010	2020
Bronx	1	73	111	140	569	604	680
	2	77,824	80,391	83,384	19,596	21,014	23,023
	3	372,427	389,133	405,667	84,482	89,227	98,116
	4	178,071	185,345	192,650	30,930	33,047	36,115
	5	178,743	183,917	190,126	51,161	54,243	59,343
	6	39,846	40,538	41,676	6,293	6,690	7,312
	7	259,641	272,982	285,618	90,490	95,205	103,723
	8	32,708	33,368	34,340	3,506	3,660	4,033
	9	53,275	54,513	56,196	9,498	9,995	10,894
	Total	1,192,608	1,240,298	1,289,797	296,525	313,685	343,239
Dutchess	10	190,028	211,822	230,360	80,492	101,817	104,724
	11	37,981	42,543	46,543	12,408	15,916	17,327
	12	31,793	35,536	38,699	10,335	12,303	12,974
	Total	259,802	289,901	315,602	103,235	130,036	135,025
Brooklyn	13	94	93	97	4,693	4,726	4,947
	14	411	411	420	9,044	10,189	13,951
	15	340,860	351,893	364,893	99,874	100,581	105,227
	16	73,654	73,996	75,748	81,018	81,453	84,835
	17	256,819	268,921	280,854	61,086	62,626	68,916
	18	323,412	333,370	345,639	63,365	63,795	66,717
	19	174,381	177,373	182,531	62,148	63,533	69,372
	20	278,315	288,216	299,250	55,078	55,468	58,058
	21	133,283	134,446	137,834	30,069	30,282	31,696
	22	367,819	373,909	384,939	94,981	95,981	101,459
	23	317,957	322,499	331,459	68,984	69,778	73,965
	24	8,702	8,571	8,725	44,022	52,539	62,539
	Total	2,275,707	2,333,698	2,412,389	674,363	690,952	741,733
Nassau	25	87,382	90,744	96,460	60,871	68,363	71,651
	26	53,996	56,388	60,059	18,350	20,361	21,149
	27	88,917	91,102	96,182	50,793	56,474	59,065
	28	107,752	110,553	116,734	66,905	75,579	80,215
	29	225,014	238,818	257,055	134,445	151,975	161,533
	30	95,312	97,324	102,526	31,417	35,067	36,787
	31	81,382	83,158	87,640	28,392	32,035	33,781
	32	92,342	96,058	102,123	27,026	30,492	32,208
	33	288,616	297,592	315,055	66,019	73,208	76,486
	34	53,563	55,301	58,579	26,253	29,680	31,711
	35	25,068	27,185	29,705	14,567	16,262	16,975
	36	102,950	105,573	111,487	25,734	28,490	29,924
	Total	1,302,294	1,349,796	1,433,605	550,772	617,986	651,485

(Continued)

Table 2-18 MTA/AKRF Forecasts of Population and Employment by Sub-County Planning District (continued)

County	MTA PD#	Population		Employment			
		1995	2010	2020	1995	2010	2020
Manhattan	37	515	515	515	7,338	7,652	7,652
	38	211,453	211,845	211,938	37,980	38,474	38,629
	39	207,439	215,198	217,026	50,472	56,549	58,048
	40E	50,840	52,925	53,416	8,321	10,484	10,639
	40W	52,863	54,926	55,411	17,960	23,336	23,491
	41	116,044	116,602	116,733	25,184	25,273	25,273
	42	29,600	35,080	36,864	31,884	39,754	43,045
	43E	45,557	46,651	47,291	35,307	37,855	38,688
	43W	24,826	25,158	25,236	43,744	47,071	47,690
	44	798	1,415	1,560	53,698	66,608	66,917
	45	6,599	12,896	14,379	15,627	27,184	27,184
	46	407	754	836	69,078	75,609	76,227
	47	174	215	225	68,615	84,287	84,906
	48	5,494	6,480	6,712	56,231	58,173	65,592
	49	2,030	2,347	2,422	39,454	42,818	44,756
	50	6,948	7,780	7,976	40,253	45,261	46,808
	51	25,037	25,037	25,037	54,818	55,286	55,441
	52	91,660	92,344	92,505	44,464	49,672	52,819
	53	9,566	9,566	9,566	28,109	35,217	37,013
	54	68,582	70,651	71,139	33,614	36,604	37,223
	55	66,006	66,856	67,057	53,212	56,528	56,683
	56	34,119	34,119	34,119	15,467	15,467	15,507
	57	8,858	8,882	8,888	27,199	31,534	32,462
	58	21,862	23,538	25,247	49,379	58,193	61,221
	59	18,099	18,174	18,234	10,408	11,835	11,838
	60	7,083	7,083	7,083	14,927	28,281	38,708
	61	5,730	5,936	5,985	35,471	45,140	46,686
	62	19,695	20,520	20,714	76,608	88,429	89,976
	63	25,147	26,072	26,290	18,169	18,276	18,276
	64	13,246	13,466	13,850	34,960	40,185	40,825
	65	7,864	7,864	7,864	59,905	73,207	74,445
	66	699	915	966	21,959	26,265	26,643
	67	247	247	247	28,112	32,981	33,290
	68	3,553	6,188	6,809	16,720	20,280	22,967
	69	369	369	369	257	1,214	1,307
	70	18,838	19,620	20,801	17,448	20,023	20,350
	71	3,068	3,556	4,155	94,130	129,565	137,994
	72	1,534	1,534	1,534	108,341	127,268	128,196
	73	15,812	16,139	16,620	27,101	29,200	29,266
	74	22,731	22,805	22,823	34,129	37,307	37,616
	75	3,533	3,776	3,833	115,914	134,368	135,915
	76	11,622	12,051	13,402	115,323	138,833	146,275
	77	19,338	19,534	21,190	20,823	22,760	26,317
	78	69,259	69,259	69,259	25,180	25,350	25,350
	79E	96,098	97,693	98,068	24,276	25,432	25,741
	79W	46,457	46,638	46,680	24,276	24,813	24,967
	80	8,543	11,316	11,969	3,500	3,837	3,837
	81	2,673	2,673	2,673	1,714	1,714	1,714
	149	1,481	1,481	1,481	36,262	53,661	59,517
Total		1,509,996	1,556,692	1,574,996	1,873,319	2,185,114	2,261,887

Table 2-18 MTA/AKRF Forecasts of Population and Employment by Sub-County Planning District
(Continued)

County	MTA PD#	Population		Employment			
		1995	2010	2020	1995	2010	2020
Orange	82	63,531	76,746	86,294	21,728	28,220	32,624
	83	77,993	94,813	106,864	24,859	31,685	36,373
	84	72,433	87,187	97,747	32,224	39,457	44,059
	85	105,542	125,954	140,595	40,780	51,313	57,512
	Total	319,499	384,700	431,500	119,591	150,675	170,568
Putnam	86	19,048	20,205	21,218	3,338	4,450	5,487
	87	70,152	78,596	85,082	16,931	21,029	25,285
	Total	89,200	98,801	106,300	20,269	25,479	30,772
Queens	88	480	673	834	7,418	7,920	8,727
	695	3,925	17,425	17,716	11,871	21,614	25,939
	696	586	1,586	1,630	9,593	25,747	32,919
	692	256	266	285	6,120	6,457	6,607
	697	1,977	2,059	2,206	13,321	14,055	14,381
	699	3,016	3,141	3,365	526	555	568
	698	2,747	2,861	3,065	368	388	397
	707	533	555	594	192	202	207
	90	149,014	154,624	164,021	29,561	31,663	34,843
	91	397,574	419,662	448,956	79,967	85,539	94,512
	92	14,484	14,567	15,236	10,927	10,888	11,900
	93	57	77	92	25,664	27,009	29,794
	94	190,470	200,623	214,356	54,066	58,167	64,380
	95	132,352	136,069	143,683	20,415	22,121	24,665
	96	91,229	92,060	96,330	24,143	26,195	29,406
	97	145,987	150,101	158,491	17,199	18,659	20,921
	98	134,839	143,357	153,902	50,095	53,311	59,354
	99	154,069	158,949	168,128	38,422	40,678	44,870
	100	118,525	122,883	130,287	20,879	22,233	24,405
	101	209,459	218,631	232,672	23,707	25,607	28,388
	102	-	-	-	58,891	61,906	67,926
	103	102,407	104,707	110,299	16,549	18,054	20,275
	148	116,313	117,525	123,051	31,464	33,981	38,027
	Total	1,970,299	2,062,401	2,189,198	550,727	612,948	683,411
Richmond	104	164,164	176,601	187,434	57,988	64,941	72,378
	105	119,567	135,548	147,738	15,863	17,788	19,734
	106	112,723	125,529	135,757	28,042	31,654	35,027
	107	1,780	1,969	2,120	444	490	550
	108	1,768	1,857	1,951	1,009	1,127	1,276
	Total	400,002	441,504	475,000	103,346	116,000	128,965
Rockland	109	48,613	52,149	55,514	30,192	35,538	39,223
	110	84,088	90,238	96,091	23,331	27,848	30,566
	111	15,345	16,401	17,420	6,721	7,914	8,911
	112	79,567	85,478	91,064	26,625	31,003	34,194
	113	47,186	51,234	54,909	12,605	14,636	15,934
	Total	274,799	295,500	314,998	99,474	116,939	128,828

(Continued)

Table 2-18 MTA/AKRF Forecasts of Population and Employment by Sub-County Planning District (continued)

County	MTA PD#	Population			Employment		
		1995	2010	2020	1995	2010	2020
Suffolk	114	195,123	216,617	240,249	101,255	119,821	140,639
	115	206,739	229,565	254,629	80,705	93,175	108,502
	116	115,605	128,309	142,284	45,857	54,224	64,099
	117	229,517	254,708	282,434	88,907	102,862	120,916
	118	407,303	452,200	501,515	120,019	145,432	177,258
	119	108,651	120,283	133,212	48,234	57,631	70,085
	120	84,159	93,514	103,776	28,585	34,338	41,225
	Total	1,347,097	1,495,196	1,658,099	513,562	607,483	722,724
Westchester	128	154,981	157,560	159,083	42,623	46,349	49,350
	129	117,944	117,011	116,642	33,816	37,116	40,016
	130	120,702	121,358	121,762	48,130	52,111	55,097
	131	96,289	96,998	97,404	42,829	46,467	50,057
	132	39,820	38,373	38,258	17,858	19,504	20,940
	133	80,518	83,603	85,295	44,018	47,312	50,192
	134	37,198	37,150	37,135	14,379	15,356	16,169
	135	73,915	74,817	75,317	29,274	32,244	34,368
	136	73,150	76,293	78,143	27,562	29,899	31,856
	137	70,833	72,695	73,712	66,024	71,185	76,417
	138	20,245	21,475	22,245	15,707	16,654	17,751
	Total	885,595	897,333	904,996	382,220	414,197	442,213
Fairfield	139	59,081	62,705	66,996	33,958	39,782	42,282
	140	127,755	139,789	151,710	82,342	93,801	98,720
	141	18,236	19,234	20,499	7,040	8,349	8,937
	142	188,715	202,567	217,832	101,128	115,043	121,085
	143	278,058	299,703	323,067	123,405	135,319	141,549
	144	166,548	182,301	198,003	73,702	81,422	85,193
	Total	838,393	906,299	978,107	421,575	473,716	497,766
Litchfield	150	181,000	211,600	241,000	84,600	105,800	123,600
New Haven	151	807,600	857,500	903,700	409,700	464,200	513,900
Region		13,653,891	14,421,219	15,229,287	6,203,278	7,025,210	7,576,116

2.8 1995 Daily Person Trip Table

The 1995 daily person trip table used in the MTA RTF Model represents nearly all travel in the New York and Connecticut portions of the metropolitan area. It is based on three sources of information:

- 1990 Census Transportation Planning Package (CTPP) data on workers by Census Tract of Residence, Census Tract of Work, and customary mode of travel.
- 1989 MTA Comprehensive Telephone Travel Survey (CTTS) data on total trip-making for 72 zones in the MTA service area.
- Observed 1995 ridership on NYCT, LIRR, and MNR services used as the basis for adjusting the 1990 CTPP/1989 CTTS data to be representative of 1995 conditions.

The first two sources of data were used to construct a Year 1990 trip table that builds on the strengths of each:

- The CTPP data is based on a very large sample of potential trip makers and factored to represent all workers over 16 in the region. It is geographically coded to a very fine level-of-detail: Census Block Groups-subsets of the zones used in the MTA RTF Model. The CTPP data set provides information on the residential location of workers over 16 and their place of employment. It also includes information on the predominate mode-to-work used during the week prior to the 1990 Census.
- The CTTS survey data are based on a telephone survey conducted in 1989 that included complete trip logs for 41,783 trips. The survey is geographically coded at the MTA super zone level; there are 73 super zones in the MTA service area. The super zone system subdivides the New York counties as follows:
 - Manhattan - 25 super zones
 - Bronx - 5 super zones
 - Queens - 8 super zones
 - Brooklyn - 9 super zones
 - Staten Island - 1 super zone
 - Westchester - 8 super zones
 - Putnam - 1 super zone
 - Dutchess - 1 super zone
 - Rockland - 1 super zone
 - Orange - 1 super zone
 - Fairfield/New Haven - 1 super zone
 - Nassau - 9 super zones
 - Suffolk - 3 super zones

The information included in the CTTS provides insight on total trip-making for all purposes.

Neither data source is adequate by itself to develop a satisfactory Year 1990 trip table, but together these two data sets provide both the detail and the coverage necessary to represent most regional travel. The CTPP provides the necessary detail in terms of both fineness of geographic coding and sample size while the CTTS provides information on all trip purposes and on frequency of travel.

The 1995 person trip tables are based on the Year 1990 CTPP/CTTS Trip Tables with two key adjustments:

1. Trips on zone-to-zone interchanges where a qualified path does not exist are either reassigned to a path that does exist or are eliminated from the trip table. This eliminates potential inconsistencies between the modeled networks and the modeled trip tables.
2. The resulting mode-specific trip tables are assigned to the 1995 base networks and assignment results are compared to observed 1995 ridership data. As necessary, the trip table is adjusted so that assignment results match observed ridership counts.

Table 2-19 summarizes the original 1990 trip tables and the adjusted 1995 person trip tables.

Table 2-19 Base 1990 and 1995 Daily Person Trip Table by Mode

Year 1990 Base Trip Tables

Mode	Purpose			Total
	Home-Based Work	Home-Based Other	Non-Home-Based	
Automobile	4,759,425	6,912,704	1,710,121	13,185,827
Commuter Rail	347,918	161,772	69,176	578,866
Subway	1,932,347	1,242,981	580,527	3,755,855
Bus	700,703	1,174,022	222,019	2,096,744
Total	7,740,393	9,491,479	2,581,843	19,813,715

Year 1995 Corrected Trip Tables

Mode	Purpose			Total
	Home-Based Work	Home-Based Other	Non-Home-Based	
Automobile	4,657,142	6,818,564	1,710,121	13,185,827
Commuter Rail	302,233	167,475	74,404	544,112
Subway	1,847,061	1,092,451	534,507	3,474,019
Bus	470,140	780,349	137,023	1,387,512
Total	7,276,576	8,858,838	2,455,605	18,591,019

2.9 Year 2010 and 2020 Daily Person Trip Table

The Year 2010 and 2020 base daily person trip tables are based on the Year 1995 person trip table, factored to represent expected changes in journey-to-work travel, population, and employment between 1995 and 2010 or 2020, respectively. The factoring process uses different procedures for home-based work and other purposes and is described in the subsections that follow.

2.9.1 Factoring Procedures for Year 2010 and 2020 Home-Based Work Trip Tables

Growth factors for adjusting the Year 1995 Home-Based Work (HBW) trip table to represent Year 2010 and 2020 socioeconomic conditions are based on county-to-county journey-to-work forecasts prepared by Urbanomics and subsequently stratified by KPMG to the MTA Transportation Planning District level. The factoring was performed as follows:

1. Each county of residence in the 1995 journey-to-work table (i.e., each row) is allocated among the different planning districts in the county according to the relative 1995 planning district population. A similar allocation is performed for the 2010 journey-to-work table and the 2020 journey-to-work using 2010 and 2020 population, respectively.
2. Each county of employment in the 1995 journey-to-work table (i.e., each column) is allocated among the different planning districts in the county according to the relative 1995 planning district establishment employment. A similar allocation is performed for the 2010 journey-to-work table and the 2020 journey-to-work using 2010 and 2020 establishment employment, respectively.
3. Year 1995-to-2010 growth factors are computed for each planning district-to-planning district combination by dividing 2010 journey-to-work trips (stratified to planning districts) by 1995 journey-to-work trips. Year 1995-to-2020 growth factors are computed using a similar approach with the 2020 journey-to-work trips.
4. Each zone-to-zone entry in the 1995 trip table is multiplied by the appropriate (the corresponding production and attraction planning district) year 1995-to-2010 factor to create the 2010 trip table. A similar procedure is used to create the year 2020 trip table.

2.9.2 Factoring Procedures for Year 2010 and 2020 Home-Based Other and Non-Home-Based Trip Tables

Each zone-to-zone entry in the home-based other and non-home based trip tables are factored by the ratio of 2010 planning district population to 1995 planning district population to create the 2010 Home-Based Other (HBO) and Non-Home-Based (NHB) trip tables. A similar procedure is used to create the 2020 HBO and NHB trip tables. Population was used as the basis for this factoring rather than journey-to-work forecasts since it was felt that most non-work travel to Manhattan (e.g., cultural events and shopping) will continue to grow in rough proportion to the population in each planning district and will not be subject to the balancing between population and employment incorporated in the journey-to-work tables.

2.9.3 Resulting 2010 and 2020 Person Trip Tables

The results of the trip table factoring process are presented in Tables 2-20 through 2-25.

Table 2-20 Year 1995, 2010, and 2020 Home-Based Work Person Trips to All Attraction Locations

County of Production	1995	2010	2020	Growth % 1995-2010	Growth % 1995-2020
Bronx	566,829	613,566	677,977	8.2%	19.6%
Kings	1,116,455	1,241,432	1,322,380	11.2%	18.4%
New York	698,249	749,240	764,688	7.3%	9.5%
Queens	1,215,584	1,354,143	1,444,658	11.4%	18.8%
Richmond	290,622	362,369	375,769	24.7%	29.3%
NEW YORK CITY	3,887,739	4,320,750	4,585,472	11.1%	17.9%
Nassau	875,931	976,795	1,041,793	11.5%	18.9%
Suffolk	875,400	1,066,710	1,254,226	21.9%	43.3%
LONG ISLAND	1,751,331	2,043,505	2,296,019	16.7%	31.1%
Dutchess	151,297	174,915	195,996	15.6%	29.5%
Orange	67,377	90,197	101,321	33.9%	50.4%
Putnam	61,526	72,240	79,954	17.9%	30.0%
Rockland	179,293	213,130	226,170	18.9%	26.1%
Westchester	568,430	619,211	659,033	8.9%	15.9%
MID-HUDSON	1,027,923	1,169,693	1,262,474	13.8%	22.8%
Fairfield	532,345	604,110	651,126	13.5%	22.3%
Litchfield	59,358	71,407	83,871	20.3%	41.3%
New Haven	17,881	20,467	21,495	14.5%	20.2%
CONNECTICUT	609,584	695,984	756,492	14.2%	24.1%
REGION	7,276,577	8,229,932	8,900,457	13.1%	22.3%

Table 2-21 Year 1995, 2010, and 2020 Home-Based Other Person Trips to All Attraction Locations

County of Production	1995	2010	2020	Growth % 1995-2010	Growth % 1995-2020
Bronx	715,672	742,050	770,846	3.7%	7.7%
Kings	1,273,635	1,304,854	1,348,515	2.5%	5.9%
New York	747,585	766,215	774,329	2.5%	3.6%
Queens	1,328,595	1,387,292	1,472,075	4.4%	10.8%
Richmond	388,536	428,034	460,289	10.2%	18.5%
NEW YORK CITY	4,454,023	4,628,445	4,826,054	3.9%	8.4%
Nassau	1,269,470	1,314,772	1,395,795	3.6%	10.0%
Suffolk	1,248,576	1,385,491	1,536,541	11.0%	23.1%
LONG ISLAND	2,518,046	2,700,263	2,932,336	7.2%	16.5%
Dutchess	244,542	272,694	296,941	11.5%	21.4%
Orange	73,235	87,986	98,613	20.1%	34.7%
Putnam	125,826	139,574	150,271	10.9%	19.4%
Rockland	143,674	154,475	164,667	7.5%	14.6%
Westchester	817,062	828,162	835,436	1.4%	2.2%
MID-HUDSON	1,404,339	1,482,891	1,545,928	5.6%	10.1%
Fairfield	421,106	455,169	491,294	8.1%	16.7%
Litchfield	46,674	54,562	62,123	16.9%	33.1%
New Haven	14,649	15,543	16,378	6.1%	11.8%
CONNECTICUT	482,429	525,274	569,795	8.9%	18.1%
REGION	8,858,837	9,336,873	9,874,113	5.4%	11.5%

Table 2-22 Year 1995, 2010, and 2020 Non-Home-Based Person Trips to All Attraction Locations

County of Production	1995	2010	2020	Growth % 1995-2010	Growth % 1995-2020
Bronx	158,479	164,351	170,742	3.7%	7.7%
Kings	311,776	319,467	330,176	2.5%	5.9%
New York	431,463	447,654	454,350	3.8%	5.3%
Queens	323,935	338,794	359,613	4.6%	11.0%
Richmond	61,255	67,491	72,581	10.2%	18.5%
NEW YORK CITY	1,286,908	1,337,757	1,387,462	4.0%	7.3%
Nassau	365,018	378,103	401,438	3.6%	10.0%
Suffolk	246,468	273,465	303,260	11.0%	23.0%
LONG ISLAND	611,486	651,568	704,698	6.6%	15.2%
Dutchess	60,863	67,868	73,901	11.5%	21.4%
Orange	19,349	23,184	25,947	19.8%	34.1%
Putnam	23,291	25,838	27,820	10.9%	19.4%
Rockland	54,687	58,813	62,703	7.0%	14.7%
Westchester	266,288	269,947	272,307	1.4%	2.3%
MID-HUDSON	424,478	445,650	462,678	5.0%	9.0%
Fairfield	98,835	106,832	115,312	8.1%	16.7%
Litchfield	10,726	12,539	14,276	16.9%	33.1%
New Haven	23,172	24,585	25,906	6.1%	11.8%
CONNECTICUT	132,733	143,956	155,494	8.5%	17.1%
REGION	2,455,605	2,578,931	2,710,332	5.0%	10.4%

Table 2-23 Year 1995, 2010, and 2020 Home-Based Work Person Trips to Manhattan Attraction Locations

County of Production	1995	2010	2020	Growth % 1995-2010	Growth % 1995-2020
Bronx	279,209	311,479	339,454	11.6%	21.6%
Kings	464,252	560,967	583,112	20.8%	25.6%
New York	486,106	528,233	531,759	8.7%	9.4%
Queens	564,291	660,797	687,051	17.1%	21.8%
Richmond	150,356	201,193	199,827	33.8%	32.9%
NEW YORK CITY	1,944,214	2,262,669	2,379,766	16.4%	22.4%
Nassau	125,961	148,040	154,002	17.5%	22.3%
Suffolk	45,817	61,909	67,972	35.1%	48.4%
LONG ISLAND	171,778	209,949	227,182	22.2%	32.3%
Dutchess	3,369	3,147	4,167	-6.6%	23.7%
Orange	10,615	15,025	16,220	41.5%	52.8%
Putnam	6,183	7,073	7,618	14.4%	23.2%
Rockland	26,460	32,479	32,212	22.7%	21.7%
Westchester	112,390	124,202	129,790	10.5%	15.5%
MID-HUDSON	159,017	181,926	189,940	14.4%	19.4%
Fairfield	25,008	29,641	31,950	18.5%	27.8%
Litchfield	732	942	1,066	28.7%	45.6%
New Haven	1,414	1,697	1,734	20.0%	22.6%
CONNECTICUT	27,154	32,280	35,535	18.9%	30.9%
REGION	2,302,163	2,686,824	2,832,423	16.7%	23.0%

Table 2-24 Year 1995, 2010, and 2020 Home-Based Other Person Trips to Manhattan Attraction Locations

County of Production	1995	2010	2020	Growth % 1995-2010	Growth % 1995-2020
Bronx	183,966	190,747	198,179	3.7%	7.7%
Kings	203,765	208,584	215,471	2.4%	5.7%
New York	505,672	519,076	524,688	2.7%	3.8%
Queens	206,898	218,284	231,811	5.5%	12.0%
Richmond	28,942	31,883	34,285	10.2%	18.5%
NEW YORK CITY	1,129,273	1,168,574	1,204,434	3.5%	6.7%
Nassau	110,715	114,808	121,970	3.7%	10.2%
Suffolk	25,715	28,539	31,652	11.0%	23.1%
LONG ISLAND	136,430	143,347	153,622	5.1%	12.6%
Dutchess	7,800	8,701	9,477	11.6%	21.5%
Orange	9,238	11,153	12,533	20.7%	35.7%
Putnam	2,293	2,523	2,704	10.0%	17.9%
Rockland	20,743	22,269	23,718	7.4%	14.3%
Westchester	85,668	86,188	86,708	0.6%	1.2%
MID-HUDSON	125,742	130,834	135,140	4.0%	7.5%
Fairfield	28,982	31,231	33,644	7.8%	16.1%
Litchfield	1,688	1,973	2,246	16.9%	33.1%
New Haven	2,050	2,176	2,292	6.1%	11.8%
CONNECTICUT	32,720	35,380	38,182	8.1%	16.7%
REGION	1,424,165	1,478,135	1,531,378	3.8%	7.5%

Table 2-25 Year 1995, 2010, and 2020 Non-Home-Based Person Trips to Manhattan Attraction Locations

County of Production	1995	2010	2020	Growth % 1995-2010	Growth % 1995-2020
Bronx	21,699	22,480	23,361	3.6%	7.7%
Kings	45,301	46,385	47,921	2.4%	5.8%
New York	229,130	238,838	242,957	4.2%	6.0%
Queens	62,788	65,909	69,953	5.0%	11.4%
Richmond	5,424	5,974	6,423	10.1%	18.4%
NEW YORK CITY	364,342	379,586	390,615	4.2%	7.2%
Nassau	19,246	19,953	21,194	3.7%	10.1%
Suffolk	6,054	6,718	7,450	11.0%	23.1%
LONG ISLAND	25,300	26,671	28,644	5.4%	13.2%
Dutchess	558	622	678	11.5%	21.5%
Orange	126	152	171	20.6%	35.7%
Putnam	93	103	110	10.8%	18.3%
Rockland	237	254	271	7.2%	14.3%
Westchester	11,936	12,027	12,103	0.8%	1.4%
MID-HUDSON	12,950	13,158	13,333	1.6%	3.0%
Fairfield	5,617	6,050	6,517	7.7%	16.0%
Litchfield	132	154	176	16.7%	33.3%
New Haven	262	278	293	6.1%	11.8%
CONNECTICUT	6,011	6,482	6,986	7.8%	16.2%
REGION	408,603	425,897	439,578	4.2%	7.6%

2.10 Mode Choice Model

The mode choice model is one of the most important components of the MTA RTF Model. It is responsible for determining the market share for each mode of travel (i.e., automobile, commuter rail, subway, and bus) and the shifts in market share that result from changes to the transportation network. The model predicts each mode's share of the total travel market for each combination of production zone and attraction zone in the region. These predictions are based on the characteristics of the trip makers and on the zone-to-zone characteristics of each mode including in-vehicle travel time, waiting time, fare, and number of transfers.

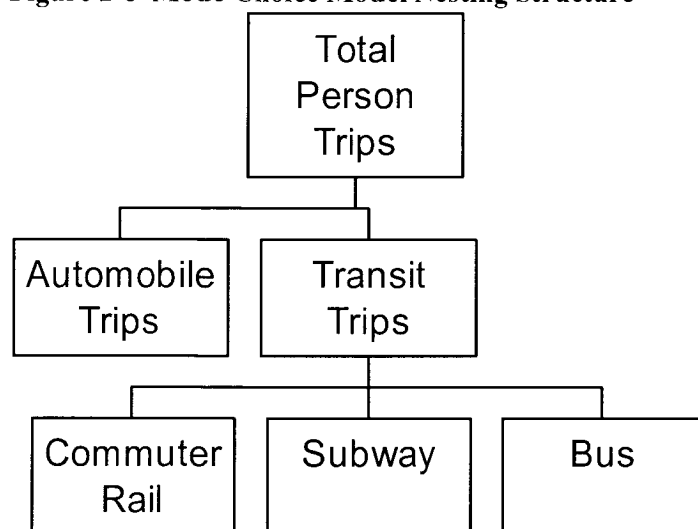
The mode choice model developed for the MTA RTF Model is a nested logit-type model. Its structure and coefficients are borrowed from the NJ TRANSIT North Jersey Transit Demand Forecasting Model with adjustments for the MTA RTF based on traveler preference research conducted by MVA Consultancy for the LMAS.

The four modes included in the mode choice model are consistent with the four modes used in the network and path-building steps and are:

1. **Automobile:** Motorized trips that drive from origin to destination without using any transit service.
2. **Commuter Rail:** Trips that use commuter rail (e.g., LIRR, Metro-North, or NJ TRANSIT rail during some portion of the trip from origin to destination). As defined in the MTA RTF Model, the commuter rail mode includes bus-to-commuter rail and subway-to-commuter trips.
3. **Subway:** Trips that use the NYCT subway or PATH during some portion of the trip from origin to destination but do *not* use commuter rail (these later trips would be characterized as commuter rail trips). As defined in the MTA RTF Model, the subway mode includes bus-to-subway trips.
4. **Bus:** Trips that use transit but do not use commuter rail or subway during any portion of the trip from origin to destination.

The structure of the modeled modes is shown in Figure 2.8.

Figure 2-8 Mode Choice Model Nesting Structure



A nested logit mode choice model works by computing the “utility” for each of the bottom level choices (i.e., automobile, commuter rail, subway, and bus). This utility represents the total economic “cost” of travel for each mode in terms of time, cost, and other impediments/inducements to travel. It is typically constructed as a linear function of the different components of time and cost as shown below:

$$U_m = (C_1 * IVTT_m + C_2 * OVTT_m + C_3 * WAIT_m + C_4 * COST_m + C_5 * DATA1_m + \dots + K_m) * 1/NC_m$$

Where:

U_m = Utility for mode m

C_1, C_2, C_3, C_4, C_5 = Calibrated coefficients

$IVTT_m$ = in-vehicle travel time for mode m

$OVTT_m$ = out-of-vehicle travel time for mode m

$WAIT_m$ = wait time for mode m

$COST_m$ = travel cost or fare for mode m

$DATA1_m \dots$ = other data elements characterizing the mode m trip

K_m = mode-specific constant for mode m

NC_m = product of the nest coefficients for all upper nests

The utility for an upper level nest (i.e., auto or transit) is computed by taking the log-sum of the lower level nests. For example, the utility for all transit is computed from the utilities for commuter rail, subway, and bus as follows:

$$U_t = NC_t * \ln(\exp(U_c) + \exp(U_s) + \exp(U_b))$$

where:

U_t = Utility for transit

NC_t = Nest coefficient for transit nest

$\ln()$ = Natural logarithm
 $\exp()$ = Exponential function (i.e., e^x)
 U_c = Utility for commuter rail
 U_s = Utility for subway
 U_b = Utility for bus

For any given choice (i.e., auto versus transit or commuter rail versus subway versus bus), the choice is computed using the logit equation:

$$S_m = \frac{e^{U_m}}{\sum_{i=1}^M e^{U_i}}$$

where:

S_m = Mode share for mode m
 U_m = Utility for mode m
 M = Number of different modes to be chosen among

The basic model structure and coefficients are based on values used in the NJ TRANSIT North Jersey Transit Demand Forecasting Model with adjustments to account for:

1. Research conducted by MVA through a stated preference survey project to determine the preferences of travelers at each commuter rail Manhattan Gateway regarding travel to Lower Manhattan; and
2. Adjustments required to fit the model to explain observed transit travel patterns in the region.

The final model coefficients are presented in Table 2-26.

Table 2-26 Final Mode Choice Coefficients for the MTA RTF Model

Mode	Home-Based Work	Home-Based Other	Non-Home Based
Automobile			
IVTT	-0.04195	-0.00789	-0.00789
Auto Cost (Year 1995 cents)	-0.00315	-0.00059	-0.00059
Commuter Rail			
In-vehicle time – commuter rail (minutes)	-0.03222	-0.02616	-0.02616
In-vehicle time - subway (minutes)	-0.04306	-0.03488	-0.03488
In-vehicle time - bus time (minutes)	-0.04306	-0.03488	-0.03488
Wait time	-0.07733	-0.06278	-0.06278
Fare (Year 1995 cents)	-0.00242	-0.00196	-0.00196
Out-of-vehicle time (minutes)	-0.03544	-0.02878	-0.02878
Transfers (number)	-0.15143	-0.12295	-0.12295
Subway Flag (=1 if subway on path, =0 otherwise)	-0.12888	-0.10464	-0.10464
Bus Flag (=1 if subway on path, =0 otherwise)	-0.12888	-0.10464	-0.10464
Subway			
In-vehicle time (minutes)	-0.04306	-0.03488	-0.03488
Wait time	-0.07733	-0.06278	-0.06278
Fare (Year 1995 cents)	-0.00242	-0.00196	-0.00196
Out-of-Vehicle time (minutes)	-0.03544	-0.02878	-0.02878
Transfers (number)	-0.15143	-0.12295	-0.12295
Bus			
In-vehicle time (minutes)	-0.04306	-0.03488	-0.03488
Wait time	-0.07733	-0.06278	-0.06278
Fare (Year 1995 cents)	-0.00242	-0.00196	-0.00196
Walk time (minutes)	-0.03544	-0.02878	-0.02878
Transfers (number)	-0.15143	-0.12295	-0.12295
Transit Nest Coefficient	0.50000	0.50000	0.50000

Note: All coefficients expressed as equivalent top-nest value. Transit coefficients are divided by the transit nest coefficient prior to computation of the utility function. Mode-specific constants for each alternative were determined during aggregate calibration and are discussed in Section 2.9.1.

2.10.1 Aggregate Calibration

Aggregate calibration is the process of establishing final mode-specific constants so that modeled shares by mode match observed shares. This model has been calibrated for 49 sub-area markets to ensure that the model replicates regional travel patterns. The 49 sub-areas represent the combination of 7 production and 7 attraction areas. These 7 areas are:

- Lower Manhattan (South of Canal)
- Midtown Manhattan (Canal to 60th Street)
- Uptown Manhattan (North of 60th Street)
- Bronx
- Brooklyn
- Queens
- Suburban and Staten Island

Travel in two submarkets (Suburban/Staten Island-to-Lower Manhattan and Suburban/Staten Island-to-Midtown) is further subdivided at the production-end according to the following subdivisions:

- Nassau County
- Western Suffolk County
- Eastern Suffolk County
- Western Westchester County
- Central Westchester County
- Eastern Westchester County
- Northern Westchester County
- Putnam and Dutchess Counties
- Orange and Rockland Counties
- Bridgeport
- Southern Fairfield County
- Northern Fairfield County
- New Haven and Litchfield Counties
- Staten Island

Constants were determined by iteratively running each model (home-based work, home-based other, and non-home-based) and comparing mode split results (trips by mode) for each market segment to market segment summaries from the survey-derived trip tables. The constants are adjusted up or down to improve the comparison between modeled and survey trips by mode and the process is repeated.

2.11 Preparation of AM Peak Period Origin-Destination Trip Tables

The mode choice model estimates the alternative-specific daily production-attraction trip tables stratified by mode and purpose. The next step is to take this information and create a new trip table suitable for assignment to the transit networks. Three conversions are required:

- **Convert the production-attraction trip tables into origin-destination format.** In other words, convert the trip table so that each row represents trip origins and each column represents trip destinations—this change allows the directionality of travel to be properly represented.

- **Select those trips that occur in the AM Peak Period.** The MTA transit networks represent transit services occurring in the peak hour. The selection of just those trips occurring in the peak period means that the assignment considers just those trips that would likely see the service represented in the network.
- **Add New Jersey-Related Travel.** Trans-Hudson travel is added to the trip table using results from the 1990 Base and 2020 No-Build versions of NJ TRANSIT's North Jersey Transit Demand (NJTDFM) Forecasting Model. This was accomplished by converting the NJTDFM representation of New York zones into the equivalent MTA RTF zone. The New Jersey zones were converted into the appropriate external station depending on where each trip crosses the Hudson River. The following external stations were defined:
 - Hudson River Tunnels approaching Penn Station
 - Lincoln Tunnel approaching the Port Authority Bus Terminal
 - George Washington Bridge approaching the George Washington Bridge Bus Terminal
 - PATH North Tube
 - PATH South Tube
 - New Jersey Ferry to Midtown
 - New Jersey Ferry to the World Financial Center

The approach for converting a production-attraction trip table to an origin-destination trip table involves developing and applying a series of multiplicative factors that represent the amount of daily travel occurring in the peak. Separate factors are applied for trips traveling from home (i.e., production-to-attraction) and the transpose (i.e., attraction-to-production). These factors are based on the 1989 MTA Comprehensive Telephone Travel Survey and are shown in Table 2-27.

The AM origin-destination trip tables are computed by multiplying the all-day production-attraction trip table by the production-to-attraction factor and the transpose of the all-day trip table by the attraction-to-production factor. As such, the sum of the production-to-attraction and the attraction-to-production factors represents the fraction of daily travel occurring in the AM Peak. None of the summed factors exceeds 0.5 meaning that 50 percent or less of the daily travel occurs in the AM Peak. In several cases, the sum of the HBW factors approaches or equals 0.5, meaning that 50 percent of the HBW trips occur in the AM Peak Period. This factor is relatively high and is caused by the fact that commuter trips in the afternoon are more likely to make intermediate stops. Thus the afternoon trip home is more likely to consist of a non-home-based trip (e.g., work-to-shop) and a home-based other trip (e.g., shop-to-home) than a single HBW trip. Accordingly, a higher percentage of the HBW trips is expected to occur in the AM Peak.

Table 2-27 Fraction of Travel Occurring in the AM Peak Period

		Production-to-Attraction	Attraction-to-Production
Commuter Rail	HBW	0.494	0.003
	HBO	0.314	0.002
	NHB	0.207	
Subway	HBW	0.479	0.005
	HBO	0.269	0.011
	NHB	0.127	
Bus	HBW	0.492	0.007
	HBO	0.265	0.003
	NHB	0.144	

2.12 AM Peak Period Assignment Procedures

Assignment is performed using the AM peak period origin-destination trip tables developed in the previous step and the TRANSCAD TASSIGN Procedure. This assignment procedure uses a capacity-constrained user-equilibrium assignment approach to assign trips to the transit network. Assignment is conducted in four phases:

1. AM Peak Period Subway Trips
2. AM Peak Period Commuter Rail Trips (trips from Metro-North Territory)
3. AM Peak Period Commuter Rail Trips (trips from LIRR Territory)
4. AM Peak Period Bus Trips

Following each phase of the assignment, the remaining capacity on each link is computed prior to beginning the assignment of the next mode. Accordingly, the commuter rail assignments are performed based on the capacity limitations imposed by the prior assignment of subway trips. Likewise, the assignment of bus trips is constrained by the prior assignment of both subway and commuter rail trips.

3. DEFINITION OF ALTERNATIVES

The ridership model described in Chapter 2 has been used to estimate the ridership implications of different possible configurations of LIRR service. This chapter describes each of the alternative LIRR service scenarios studied and presented in this report.

3.1 Year 1995 Base (NB95)

The Year 1995 Base (designated with the code “NB95” in the tables summarizing the results) represents the highway and transit networks as they existed in 1995 with the demand for travel as it existed in 1995. The results of this scenario are used to both:

- Validate the performance of the model to confirm that it appropriately represents observed conditions; and
- Provide a basis for comparison that shows how ridership is expected to change between the present and the forecast years.

Specific assumptions regarding the LIRR service in 1995 are provided in Tables 3-1 and 3-2.

3.2 Year 2010 and Year 2020 No-Build (NB13 and NB23)

The Year 2010 and 2020 No-Build Scenarios represent conditions given either 2010 or 2020 levels of demand and the future-year No-Build Network. The No-Build network is based on existing conditions with committed changes that are assumed to occur between 1995 and 2010/2020 and are independent of the decision to build or not build the East Side Access Project. These runs are designated as NB13 (2010 No-Build) and NB23 (2020 No-Build). The principal differences between the 1995 and future-year No-Build networks are as follows:

1. **Fare Policy.** As indicated in Chapter 2, the future year fare policy is slightly different from the 1995 fare policy. In constant year dollars, the fares on the LIRR are expected to decline by between 3 and 4 percent between 1995 and either 2010 or 2020. This is consistent with current MTA fare policy that fares would increase in November 1995 and would not increase again until the Year 2000. Following that period, the MTA has assumed for its Long Range Planning Framework projects that fare would rise proportionately with the Consumer Price Index.

The no-build fare policy assumes that subway and bus fares would rise proportionately with inflation between 1995 and 2020. The free Metro-Card bus-to-subway and bus-to-bus transfers that have been recently implemented are assumed available in 2010 and 2020.

2. **LIRR Service.** The future year No-Build operating scenario is similar to the 1995 service plan but assumes that the LIRR is able to increase the AM Peak Hour Capacity of Penn Station from 36 trains per hour today to 42 trains per hour in the future. The LIRR will utilize this additional capacity to operate 6 new peak hour dual mode trains from its non-electrified territory directly into New York Penn Station. A summary of the assumed LIRR services in the 2020 No-Build is provided in Tables 3-3 and 3-4.
3. **Subway Service.** The future year No-Build includes the construction and operation of NYCT's 63rd Street Tunnel Connection to the Queens Boulevard Line. Direct service from 179th Street to the 63rd Street Tunnel is provided in the No-Build Scenario.

4. **Metro-North Changes.** The future year No-Build also includes minor changes to the Metro-North Network including the extension of the Harlem Line to Wassaic and the Secaucus Transfer in New Jersey which will allow direct transfers from the MNR Port Jervis and Spring Valley Lines to NJ TRANSIT's Northeast Corridor Service to Penn Station.
5. **Bus Service Changes.** The 2010 and 2020 No-Build Networks include the MTA's representation of expected future year bus services.

3.3 Year 2010 and Year 2020 Transportation Systems Management (T310 and TSM3)

The Year 2010 and 2020 Transportation Systems Management (TSM) Alternative represents a low-capital cost scenario for purposes of assessing the effectiveness of the Build Alternatives. The TSM alternatives are based on the scenarios developed for the LIRR ESA MIS project and are designated as T310 (2010 TSM) and TSM3 (2020 TSM). They are similar to the 2010/2020 No-Build Scenarios with the following additional system enhancements:

1. **Additional LIRR Train Capacity.** Additional capacity was assumed for selected trains on the LIRR system by assuming that selected trains would operate with a full 11 or 12 car consist. These changes are as follows.
 - 2,400 additional seats/hour on Babylon Branch
 - 1,680 additional seats/hour on Port Washington Branch
 - 960 additional seats/hour on Long Beach Branch
 - 720 additional seats/hour on Far Rockaway Branch
2. **Increased LIRR service to Hunterspoint Avenue and Long Island City.** Additional LIRR service is provided to Hunterspoint Avenue and Long Island City as follows:
 - One additional peak hour train from Port Jefferson to Hunterspoint Avenue
 - One additional peak hour train from Port Jefferson to Hunterspoint Avenue continuing to Long Island City
 - One additional peak hour train from Yaphank to Hunterspoint Avenue
 - One additional peak hour train from Oyster Bay to Hunterspoint Avenue
 - One additional peak hour train from Patchogue to Hunterspoint Avenue
 - One additional peak hour train from Speonk to Long Island City
3. **Contra-Flow Lanes on the Long Island Expressway.** The existing contra-flow bus lane on the Long Island Expressway is assumed to be extended to 102nd Street in Queens (near the interchange with the Grand Central Parkway). The facility improves the AM Peak Hour travel time for the Queens Express bus service to Manhattan as follows:
 - Entering the LIE at Main Street: X51 saves 7 minutes
 - Entering the LIE at Van Wyck Expressway: QM2, QM2A, and QM3 save 7 minutes
 - Entering the LIE at Woodhaven Avenue: BQM1, X63, X64, X68, QM1, QM1A, QM1Aext, QM4, QM10, QM11, QM12, QM15, QM16, QM17, QM18, QM21, QM23, QM24, and QM24W save 7 minutes
 - Entering the LIE at 21st Street (Long Island City): QM22 saves 2 minutes

For purposes of modeling, the express bus time savings quoted above are divided by two to account for the fact that the contra-flow lane operates in the AM peak inbound direction only. No benefit accrues to travelers in the PM peak.

3.4 Year 2010 and Year 2020 Build (G310 and GCT3)

The Year 2010 and 2020 Build Scenarios represent the scenario in which the LIRR East Side Access to GCT is constructed. These alternatives are designated as G310 (Year 2010 Build) and GCT3 (Year 2020 Build). Each scenario is identical to the No-Build Scenarios with the exception that:

- The LIRR operates 24 peak hour trains to Grand Central Terminal; and
- AM Peak Hour Trains operating into Penn Station are reduced from 42 (in the 2020 no-build) to 37 trains (in the 2020 build).
- Local trains to Penn Station (i.e., those previously making a station stop at Jamaica) are assumed to make a stop a new station located at Sunnyside.

A summary of the build train operating plan is presented in Tables 3-5 and 3-6.

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Table 3-1 Year 1995 Base AM Peak Hour In-Bound LIRR Service to each Terminal

	New York Penn Station			Grand Central Terminal			Flatbush Avenue			Hunterspoint Avenue			Long Island City			ALL TERMINI		
	ID	#	cap	ID	#	cap	ID	#	cap	ID	#	cap	ID	#	cap	#	cap	cap/train
Port Washington	501	4	2,640													4	2,640	660
	502	1	1,200													1	1,200	1,200
	503	2	1,200													2	1,200	600
	504	1	2,160													1	2,160	2,160
	Total	8	7,200	Total	0	0	Total	0	0	Total	0	0	Total	0	0	Total	8	7,200
Port Jefferson	507	2	2,640													4	4,560	1,140
	508	1	1,200													3	3,360	1,120
	509	2	2,880													2	2,880	1,440
	Total	5	6,720	Total	0	0	Total	1	1,200	Total	3	2,880	Total	0	0	Total	9	10,800
																		1,200
Ronkonkoma	511	1	1,440													2	2,160	1,080
	512	1	1,440													1	1,440	1,440
	513	1	1,200													1	1,200	1,200
	Total	3	4,080	Total	0	0	Total	1	720	Total	0	0	Total	0	0	Total	4	4,800
																		1,200
Oyster Bay	517	1	1,200													3	2,640	880
	Total	1	1,200	Total	0	0	Total	0	0	Total	1	600	Total	1	840	Total	3	2,640
																		880
Hempstead	519	2	960													4	2,640	660
	Total	2	960	Total	0	0	Total	2	1,680	Total	0	0	Total	0	0	Total	4	2,640
																		660
West Hempstead	521	1	960													2	1,440	720
	Total	1	960	Total	0	0	Total	1	480	Total	0	0	Total	0	0	Total	2	1,440
																		720
Far Rockaway	523	2	2,160													4	3,600	900
	524	1	1,200													1	1,200	1,200
	Total	3	3,360	Total	0	0	Total	2	1,440	Total	0	0	Total	0	0	Total	5	4,800
																		960
Long Beach	525	1	1,440													2	1,920	960
	526	1	960													1	960	960
	527	1	1,200													1	1,200	1,200
	Total	3	3,600	Total	0	0	Total	1	480	Total	0	0	Total	0	0	Total	4	4,080
																		1,020
Babylon	530	2	1,200													6	4,320	720
	531	8	9,120													8	9,120	1,140
	Total	10	10,320	Total	0	0	Total	4	3,120	Total	0	0	Total	0	0	Total	14	13,440
																		960
Montauk	534	1	1,200													532	3	2,520
	Total	1	1,200	Total	0	0	Total	0	0	Total	1	720	Total	1	600	Total	3	2,520
																		840
GRAND TOTAL		37	39,600		0	0		12	9,120		5	4,200		2	1,440		56	54,360
																		971

Note: “#” indicates the number of trains of that ID occurring in the AM Peak Hour. “cap” indicates the total coded hourly capacity for all trains of that ID. “cap/train” indicates the implied seated capacity of each train.

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Table 3-2 Year 1995 Base AM Peak Hour Out-Bound LIRR Service from each Terminal

	New York Penn Station			Grand Central Terminal			Flatbush Avenue			Hunterspoint Avenue			Long Island City			ALL TERMINI		
	ID	#	cap	ID	#	cap	ID	#	cap	ID	#	cap	ID	#	cap	#	cap	cap/train
Port Washington	699	2	2,400													2	2,400	1,200
	678	1	1,200													1	1,200	1,200
	Total	3	3,600	Total	0	0	Total	0	0	Total	0	0	Total	0	0	Total	3	3,600
Port Jefferson	680/682	1	1,200													1	1,200	1,200
	696	3	1,200													3	1,200	400
	Total	4	2,400	Total	0	0	Total	0	0	Total	0	0	Total	0	0	Total	4	2,400
Ronkonkoma	693	1	1,200													1	1,200	1,200
	691/694	1	1,200													1	1,200	1,200
	Total	2	2,400	Total	0	0	Total	0	0	Total	0	0	Total	0	0	Total	2	2,400
Oyster Bay		0	0													1	1,200	1,200
	Total	0	0	Total	0	0	677/698	1	1,200	Total	0	0	Total	0	0	Total	1	1,200
							Total	1	1,200	Total	0	0	Total	0	0	Total	1	1,200
Hempstead		0	0				692	1	1,200	Total	0	0	Total	0	0	Total	1	1,200
	Total	0	0	Total	0	0	Total	1	1,200	Total	0	0	Total	0	0	Total	1	1,200
							690	1	1,200	Total	0	0	Total	0	0	Total	1	1,200
West Hempstead		0	0				Total	1	1,200	Total	0	0	Total	0	0	Total	1	1,200
	Total	0	0	Total	0	0	681	1	1,200	Total	0	0	Total	0	0	Total	1	1,200
							683	1	1,200	Total	0	0	Total	0	0	Total	1	1,200
Far Rockaway		0	0				Total	2	2,400	Total	0	0	Total	0	0	Total	2	2,400
	Total	0	0	Total	0	0	684	1	1,200	Total	0	0	Total	0	0	Total	1	1,200
							Total	1	1,200	Total	0	0	Total	0	0	Total	1	1,200
Long Beach		0	0													1	1,200	1,200
	Total	0	0	Total	0	0				Total	0	0	Total	0	0	Total	1	1,200
										Total	0	0	Total	0	0	Total	1	1,200
Babylon	685	1	1,200													1	1,200	1,200
	686	1	1,200													1	1,200	1,200
	687	1	1,200													1	1,200	1,200
Montauk	Total	3	3,600	Total	0	0	Total	0	0	Total	0	0	Total	0	0	Total	3	3,600
	679/688	1	1,200													532	1	1,200
	Total	1	1,200	Total	0	0	Total	0	0	Total	0	0	Total	0	0	Total	1	1,200
GRAND TOTAL		13	13,200		0	0		6	7,200		0	0		0	0	19	20,400	1,074

Note: “#” indicates the number of trains of that ID occurring in the AM Peak Hour. “cap” indicates the total coded hourly capacity for all trains of that ID. “cap/train” indicates the implied seated capacity of each train.

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Table 3-3 Year 2010/2020 No-Build AM Peak Hour In-Bound LIRR Service to each Terminal

	New York Penn Station			Grand Central Terminal			Flatbush Avenue			Hunterspoint Avenue			Long Island City			ALL TERMINI		
	ID	#	cap/train	ID	#	cap/train	ID	#	cap/train	ID	#	cap/train	ID	#	cap/train	#	cap	cap/train
Port Washington	501	4	2,640													4	2,640	660
	502	1	1,200													1	1,200	1,200
	503	2	1,200													2	1,200	600
	504	1	2,160													1	2,160	2,160
	Total	8	7,200													Total	8	7,200
Port Jefferson	505	1	980													3	2,900	967
	506	2	1,260													2	1,260	630
	507	2	2,640													2	2,640	1,320
	508	1	1,200													1	1,200	1,200
	509	2	2,880													2	2,880	1,440
Ronkonkoma	Total	6	6,080													Total	8	8,000
	511	1	1,440													3	3,360	1,120
	512	1	1,440													1	1,440	1,440
	513	1	1,200													1	1,200	1,200
	Total	3	4,080													Total	5	6,000
Oyster Bay	515	1	560													2	1,160	580
	517	1	1,200													1	1,200	1,200
	Total	2	1,760													Total	3	2,360
	519	2	960													4	2,640	660
	Total	2	960													Total	4	2,640
Hempstead	521	1	960													2	1,440	720
	Total	1	960													Total	2	1,440
	523	2	2,160													4	3,600	900
	524	1	1,200													1	1,200	1,200
	Total	3	3,360													Total	5	4,800
Long Beach	525	1	1,440													2	1,920	960
	526	1	960													1	960	960
	527	1	1,200													1	1,200	1,200
	Total	3	3,600													Total	4	4,080
	530	2	2,400													10	5,520	552
Babylon	531	8	9,120													8	9,120	1,140
	Total	10	11,520													Total	18	14,640
	533	1	560													532	3	1,760
	534	1	1,200													1	1,200	1,200
	535	1	840													1	840	840
Montauk	Total	3	2,600													Total	5	3,800
	536	1	1,200													1	1,200	1,200
	537	1	1,200													1	1,200	1,200
	538	1	1,200													1	1,200	1,200
	Total	3	3,600													Total	3	3,600
GRAND TOTAL			41	42,120	1,027											62	54,960	886

Note: “#” indicates the number of trains of that ID occurring in the AM Peak Hour. “cap” indicates the total coded hourly capacity for all trains of that ID. “cap/train” indicates the implied seated capacity of each train.

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Table 3-4 Year 2010/2020 No-Build AM Peak Hour Out-Bound LIRR Service from each Terminal

	New York Penn Station			Grand Central Terminal			Flatbush Avenue			Hunterspoint Avenue			Long Island City			ALL TERMINI		
	ID	#	cap	ID	#	cap	ID	#	cap	ID	#	cap	ID	#	cap	#	cap	cap/train
Port Washington		699	1	2,400		2,400										1	2,400	2,400
		678	1	1,200		1,200										1	1,200	1,200
	Total	2	3,600		Total	0	0		Total	0	0		Total	0	0	Total	2	3,600
Port Jefferson		680/682	1	1,200		1,200										1	1,200	1,200
		696	2	1,200		600										2	1,200	600
	Total	3	2,400		Total	0	0		Total	0	0		Total	0	0	Total	3	2,400
Ronkonkoma		693	1	1,200		1,200										1	1,200	1,200
		691/694	1	1,200		1,200										1	1,200	1,200
	Total	2	2,400		Total	0	0		Total	0	0		Total	0	0	Total	2	2,400
Oyster Bay		Total	0	0												1	1,200	1,200
		Total	0	0												1	1,200	1,200
	Total	0	0		Total	0	0		Total	0	0		Total	0	0	Total	1	1,200
Hempstead		Total	0	0												1	1,200	1,200
		Total	0	0												1	1,200	1,200
	Total	0	0		Total	0	0		Total	0	0		Total	0	0	Total	1	1,200
West Hempstead		Total	0	0												1	1,200	1,200
		Total	0	0												1	1,200	1,200
	Total	0	0		Total	0	0		Total	0	0		Total	0	0	Total	1	1,200
Far Rockaway		Total	0	0												1	1,200	1,200
		Total	0	0												1	1,200	1,200
	Total	0	0		Total	0	0		Total	0	0		Total	0	0	Total	2	2,400
Long Beach		Total	0	0												1	1,200	1,200
		Total	0	0												1	1,200	1,200
	Total	0	0		Total	0	0		Total	0	0		Total	0	0	Total	1	1,200
Babylon		685	1	1,200		1,200										1	1,200	1,200
		686	1	1,200		1,200										1	1,200	1,200
		687	1	1,200		1,200										1	1,200	1,200
Montauk		Total	3	3,600		1,200										Total	3	3,600
		679/688	1	1,200		1,200										1	1,200	1,200
	Total	1	1,200		Total	0	0		Total	0	0		Total	0	0	Total	1	1,200
GRAND TOTAL		11	13,200			1,200			6	7,200		1,200			0	17	20,400	1,200

Note: “#” indicates the number of trains of that ID occurring in the AM Peak Hour. “cap” indicates the total coded hourly capacity for all trains of that ID. “cap/train” indicates the implied seated capacity of each train.

Table 3-5 Year 2010/2020 Build AM Peak Hour In-Bound LIRR Service to each Terminal

	New York Penn Station			Grand Central Terminal			Flatbush Avenue			Hunterspoint Avenue			Long Island City			ALL TERMINI					
	ID	#	cap	cap/train	ID	#	cap	cap/train	ID	#	cap	cap/train	ID	#	cap	cap/train	#	cap	cap/train		
Port Washington	501	3	1,980	660	701	2	2,400	1,200									5	4,380	876		
	502	1	1,200	1,200	702	1	1,200	1,200									2	2,400	1,200		
	503	1	1,200	1,200	703	1	1,200	1,200									2	2,400	1,200		
	504	1	1,200	1,200	704	2	2,400	1,200									3	3,600	1,200		
	Total	6	5,580	930	Total	6	7,200	1,200	Total	0	0	Total	0	0	Total	0	0	Total	12	12,780	1,065
Port Jefferson	505	1	980	980	707	3	4,320	1,440									5	6,020	1,204		
	506	2	1,920	960	709	2	2,880	1,440									4	4,800	1,200		
	508	1	1,200	1,200	710	1	1,440	1,440									2	2,640	1,320		
	509	2	2,880	1,440													2	2,880	1,440		
	Total	6	6,980	1,163	Total	6	8,640	1,440	Total	0	0	Total	1	720	720	0	0	Total	13	16,340	1,257
Ronkonkoma	511	1	1,440	1,440	712	2	2,880	1,440									3	4,320	1,440		
	513	1	1,200	1,200	713	2	2,880	1,440									3	4,080	1,360		
	514	1	720	720													1	720	720		
	535	1	840	840													1	840	840		
	Total	3	3,360	1,120	Total	4	5,760	1,440	Total	0	0	Total	0	0	Total	0	0	Total	7	9,120	1,303
Oyster Bay	515	1	960	960	Total	0	0										2	1,560	780		
	Total	1	960	960	Total	0	0	Total	0	0	Total	1	600	600	Total	0	0	Total	2	1,560	780
Hempstead	519	2	960	480	719	2	2,880	1,440									6	5,760	960		
	Total	2	960	480	Total	2	2,880	1,440	Total	2	1,920	960	Total	0	0	Total	0	0	Total	6	5,760
West Hempstead	521	1	960	960	Total	0	0										2	1,440	720		
	Total	1	960	960	Total	0	0	520	1	480	480	Total	0	0	Total	0	0	Total	2	1,440	720
Far Rockaway	523	1	1,080	1,080	723	1	1,440	1,440									4	3,960	990		
	Total	1	1,080	1,080	Total	1	1,440	1,440	522	2	1,440	720	Total	0	0	Total	0	0	Total	2	1,440
Long Beach	524	1	1,200	1,200	727	1	1,440	1,440									3	3,120	1,040		
	525	1	1,440	1,440													1	1,440	1,440		
	526	1	960	960													1	960	960		
	527	1	1,200	1,200													1	1,200	1,200		
	Total	4	4,800	1,200	Total	1	1,440	1,440	Total	1	480	480	Total	0	0	Total	0	0	Total	6	6,720
Babylon	530	2	1,920	960	730	2	2,880	1,440									8	6,960	870		
	531	8	9,120	1,140	731	2	2,880	1,440									10	12,000	1,200		
	Total	10	11,040	1,104	Total	4	5,760	1,440	Total	4	2,160	540	Total	0	0	Total	0	0	Total	18	18,960
Montauk	533	1	960	960													532	3	2,160	720	
	534	1	1,200	1,200													1	1,200	1,200		
	Total	2	2,160	1,080	Total	0	0						Total	1	600	600	Total	4	3,360	840	
GRAND TOTAL		36	37,880	1,052		24	33,120	1,380									74	80,000	1,081		

Note: “#” indicates the number of trains of that ID occurring in the AM Peak Hour. “cap” indicates the total coded hourly capacity for all trains of that ID. “cap/train” indicates the implied seated capacity of each train.

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Table 3-6 Year 2010/2020 No-Build AM Peak Hour Out-Bound LIRR Service from each Terminal

	New York Penn Station			Grand Central Terminal			Flatbush Avenue			Hunterspoint Avenue			Long Island City			ALL TERMINI		
	ID	#	cap	ID	#	cap	ID	#	cap	ID	#	cap	ID	#	cap	#	cap	cap/train
Port Washington	899	1	1,200	873	4	4,800										5	6,000	1,200
	878	1	1,200													1	1,200	1,200
	Total	2	2,400	Total	4	4,800	Total	0	0	Total	0	0	Total	0	0	Total	6	7,200
Port Jefferson	880/882	1	1,200	874	3	4,320										4	5,520	1,380
	896	2	2,880													2	2,880	1,440
	Total	3	4,080	Total	3	4,320	Total	0	0	Total	0	0	Total	0	0	Total	6	8,400
Ronkonkoma	893	1	1,200	894	1	1,200										2	2,400	1,200
	891/894	1	1,200													1	1,200	1,200
	Total	2	2,400	Total	1	1,200	Total	0	0	Total	0	0	Total	0	0	Total	3	3,600
Oyster Bay		0	0		0	0	877/898	1	1,200							1	1,200	1,200
	Total			Total	0	0	Total	1	1,200	Total	0	0	Total	0	0	Total	1	1,200
Hempstead	876	1	1,440	875	1	1,440	892	1	960							3	3,840	1,280
	Total	1	1,440	Total	1	1,440	Total	1	960	Total	0	0	Total	0	0	Total	3	3,840
West Hempstead		0	0		0	0	890	1	1,200							1	1,200	1,200
	Total	0	0	Total	0	0	Total	1	1,200	Total	0	0	Total	0	0	Total	1	1,200
Far Rockaway		0	0		0	0	881	1	1,200							1	1,200	1,200
	Total	0	0	Total	0	0	883	1	1,200							1	1,200	1,200
							Total	2	2,400	Total	0	0	Total	0	0	Total	2	2,400
Long Beach		0	0		0	0	884	1	1,200							1	1,200	1,200
	Total	0	0	Total	0	0	Total	1	1,200	Total	0	0	Total	0	0	Total	1	1,200
Babylon	885	1	1,440	827	3	4,320										4	5,760	1,440
	886	1	1,200													1	1,200	1,200
	887	1	1,200													1	1,200	1,200
Montauk	Total	3	3,840	Total	3	4,320	Total	0	0	Total	0	0	Total	0	0	Total	6	8,160
	879/888	1	1,200													532	1,200	1,200
	Total	1	1,200	Total	0	0	Total	0	0	Total	0	0	Total	0	0	Total	1	1,200
GRAND TOTAL		12	15,360		12	16,080		6	6,960		0	0		0	0	30	38,400	1,280

Note: “#” indicates the number of trains of that ID occurring in the AM Peak Hour. “cap” indicates the total coded hourly capacity for all trains of that ID. “cap/train” indicates the implied seated capacity of each train.

4. YEAR 2010 FORECAST RESULTS

This chapter presents the results of the ridership forecasting models for the 2010 forecast year. Similar results for the 2020 forecast year are presented in Chapter 5. The results presented in this chapter include the impacts of the build and TSM projects on total transit and LIRR ridership (linked trip impacts) and on ridership to each LIRR Manhattan terminal. The difference between total LIRR ridership to GCT and the number of new LIRR linked trips is the number of existing riders diverted from Penn Station or some other terminal to the new service to GCT.

This chapter also presents ridership forecasting results that are used in the development of the draft environmental impact statement. This information includes the distribution of LIRR-to-GCT passengers to different Manhattan Zones for purposes of evaluating pedestrian congestion; vehicle-miles of travel impact, and estimates of parking demand for each station.

4.1 Year 2010 Linked Trip Impacts

One of the best indicators of the ability of a transit project to attract new customers and increase market share is the number of linked trips by mode. Linked trips by mode represent the region-wide total travel from each origin to each destination traveling on each mode. The linked trip tables are a direct outcome of the mode choice model and therefore the modes that can be reported are identical to the modes defined in the mode choice model. These modes are:

- Automobile
- Commuter Rail (including commuter rail/subway trips and commuter rail/bus trips)
- Subway (including subway/bus trips)
- Bus

In the case of the transit mode, each trip is counted once, no matter how many transfers are made or how many transit vehicles are boarded. Accordingly, this measure is directly related to the total travel by transit and provides a realistic basis for comparing alternatives the force many transfers to alternatives that force few transfers.

Table 4-1 presents a comparison of the Year 2010 Weekday (All-Day) Linked Trips by Mode for each of the 2010 scenarios discussed in Chapter 3. This table is stratified by trip purpose as follows:

- HBW – Home-Based Work
- HBO – Home-Based Other
- NHB – Non-Home-Based

Table 4-1 also presents the total (all purposes) incremental linked trips as compared to the No-Build Alternative (NB13). As this table shows, the total number of incremental linked trips for all modes of travel is very nearly equal to zero. This is a result of the fact that a fixed person trip table is used in this travel demand forecasting model and that total travel is constrained to the same number of person trips in any given year.

The number of incremental Year 2010 Weekday Automobile Trips shows that the TSM Alternative is able to reduce automobile travel by 3,400 trips per weekday and the LIRR-to-GCT Alternative is able to reduce Automobile Travel by 14,200 trips per weekday. Conversely, the model results also show that the TSM and LIRR-to-GCT Alternatives add 3,400 and 14,200 new weekday transit riders. This is the “New

Riders-as compared to No-Build” statistic included in the FTA Section 5309 *Annual Report on New Starts*. The number of New Riders as Compared to TSM is the difference between these two figures or 10,800 Daily New Riders.

Table 4-1 also presents an estimate of the number of commuter rail linked trips predicted by the mode choice model. This statistic is similar, but not identical, to the total number of LIRR and MNR trips in the region. It is not identical to the assigned commuter rail volumes since commuter rail trips may be assigned to non-commuter rail services and vice-versa in the capacity-constrained assignment. Nevertheless, the number of new commuter rail trips (build versus no-build) predicted by the mode choice model provides an indication of the expected increase in daily LIRR daily trips. In 2010, the mode choice model predicts 29,200 additional daily LIRR linked trips in the LIRR-to-GCT build condition than in the No-Build. In addition, the assignment procedures assign an additional 3,900 non-commuter rail trips in the Build alternative due to the increased availability of LIRR capacity. The number of additional daily LIRR trips is presented in Table 4-2 and is equal to 33,000 additional daily LIRR trips in the Build Alternative as compared to the No-Build.

Table 4-1 Year 1995 and 2010 Weekday (All-Day) Linked Person Trips by Mode and Purpose

		1995 Base Network (NB95)	2010 No-Build Network (NB13)	2010 Transportation Systems Management (T310)	2010 LIRR-to- GCT Build (G310)
HBW					
	Auto	4,455,549	4,898,639	4,896,172	4,890,530
	Commuter Rail	285,682	368,126	371,172	386,916
	Subway	1,794,233	2,185,990	2,181,888	2,176,926
	Bus	455,831	443,267	446,791	441,652
	Total	6,991,295	7,896,022	7,896,023	7,896,024
HBO					
	Auto	6,450,701	6,763,135	6,762,488	6,757,846
	Commuter Rail	147,258	167,406	169,184	174,621
	Subway	1,065,638	1,198,240	1,197,107	1,197,121
	Bus	758,066	734,394	734,396	733,587
	Total	8,421,663	8,863,175	8,863,176	8,863,175
NHB					
	Auto	1,641,898	1,704,763	1,704,469	1,703,962
	Commuter Rail	57,712	59,383	60,296	62,547
	Subway	489,708	546,901	546,344	544,837
	Bus	128,210	118,854	118,791	118,555
	Total	2,317,528	2,429,901	2,429,901	2,429,901
TOTAL					
	Auto	12,548,148	13,366,537	13,363,129	13,352,338
	Commuter Rail	490,653	594,915	600,652	624,084
	Subway	3,349,579	3,931,131	3,925,339	3,918,884
	Bus	1,342,107	1,296,515	1,299,979	1,293,794
	Total	17,730,486	19,189,098	19,189,099	19,189,100
INCREMENTAL (versus NB13)					
TOTAL					
	Auto		-	(3,408)	(14,199)
	Commuter Rail		-	5,738	29,169
	Subway		-	(5,793)	(12,247)
	Bus		-	3,464	(2,722)
	Total		-	1	1

Note: Totals may not add due to rounding.

Table 4-2 2010 Incremental (Versus No-Build) Daily LIRR Trips

	2010 No-Build Network (NB13)	2010 Transportation Systems Management (T310)	2010 LIRR-to- GCT Build (G310)
Commuter Rail Mode	-	5,738	29,169
Other Modes Assigned to Rail	-	(1,027)	3,876
Total	-	4,711	33,045

4.2 Year 2010 Station Utilization

Another important result of the ridership forecasting process is the number of trips utilizing key facilities that will be affected by the project. This statistic is equivalent to a number of riders that could be counted boarding or alighting at each station or the number of persons on-board trains as they travel to or from each terminal station.

Table 4-3 presents AM Peak 4-Hour (6-10 AM) and estimated daily LIRR riders arriving at each terminal. Table 4-4 and Table 4-5 present similar information for LIRR riders departing each terminal and the sum of arrivals plus departures, respectively.

The first two columns of each table represent passenger counts taken by the LIRR in 1990 and 1995 and are used to confirm the accuracy of the model results. The counts can be compared to the column labeled "NB95" which presents the modeled estimates of Year 1995 LIRR activity at each terminal. As this table shows, the model does an excellent job of representing total (all terminals) daily 1995 LIRR arrivals and departures. The model also does reasonably well in replicating the distribution of activity among individual terminals and travel occurring in the AM Peak 4-Hour Period as a fraction of daily activity.

The next three columns represent forecasted model activity at each terminal for the 2010 No-Build (NB13), the 2010 Transportation Systems Management (T310), and 2010 LIRR-to-GCT Build (G310) Alternatives. As shown in these tables, total daily passenger activity (arrivals plus departures) for all LIRR terminals is forecasted to increase from 245,900 daily arriving and departing passengers in 1995 to 288,600 in the 2010 No-Build, an increase of 17 percent. The TSM alternative reduces this to 285,400 daily arriving and departing passengers. This decline is largely due to substantial improvements to bus operations on the Long Island Expressway that attracts riders away from the LIRR and to express bus services.

The 2010 LIRR-to-GCT alternative (G310) increases total (all terminals) daily LIRR arrivals and departures to 329,700, an increase of 41,100 trips (14.3 percent) over the 2010 No-Build. Daily arrivals and departures at Grand Central Terminal will be 151,600 and the new Sunnyside Station will attract 5,100 daily riders. Activity at Penn Station will drop from 259,000 to 151,200, a drop of 107,800 (-42 percent).

The fact that LIRR terminal volumes increase by 41,100 while total LIRR volumes increases by only 33,000 is caused by a greater percentage of passengers utilizing terminal stations in the LIRR-to-GCT Build than in the No-Build. Key examples of this phenomenon are as follows:

- The addition of Sunnyside Station results in a drop of 2,600 daily passengers at Woodside. In effect demand is shifted from LIRR line stations to one of the terminal stations
- About least 1,600 daily reverse peak trips are made between Penn Station and Sunnyside. Each such trip results in *two* arrivals or departures at the terminal stations.
- About 1,000 more trips make a rail-to-rail transfer at a terminal station in the Build Case than in the No-Build. Each such trip results in *two* arrivals or departures at the terminal stations.
- The service plan used to simulate the impact of LIRR service to GCT results in a modest drop in LIRR volumes to other non-terminal stations of approximately 1,200 intra-Long Island trips
- Approximately 1,800 trips are lost due to different peak period-to-daily factors being used at Hunterspoint and Flatbush Avenue represent the low (or non-existent) peak period utilization at these stations.

Table 4-3 Year 1995 and 2010 AM Peak and All-Day LIRR Arrivals by Terminal

	1990 Counts	1995 Counts	1995 Base Network (NB95)	2010 No-Build Network (NB13)	2010 Transportation Systems Management (T310)	2010 LIRR-to- GCT Build (G310)
AM Peak (6-10 AM)						
Penn Station	86,950	86,630	86,851	103,856	100,348	58,154
Grand Central	0	0	0	0	0	62,334
Hunterspoint Ave	3,457	2,890	3,279	3,260	4,682	514
Long Island City	195	240	137	44	131	40
Flatbush Ave	12,942	11,670	10,610	11,374	12,275	9,911
Sunnyside	0	0	0	0	0	2,070
Total	103,544	101,430	100,878	118,533	117,435	133,024
All-Day						
Penn Station	106,270	107,570	109,212	130,162	126,328	75,987
Grand Central	0	0	0	0	0	76,194
Hunterspoint Ave	3,457	2,890	3,279	3,260	4,682	514
Long Island City	195	240	136	43	130	40
Flatbush Ave	13,466	14,650	12,721	13,394	14,400	11,744
Sunnyside	0	0	0	0	0	2,568
Total	123,388	125,350	125,349	146,859	145,539	167,047

Table 4-4 Year 1995 and 2010 AM Peak and All-Day LIRR Departures by Terminal

	1990 Counts	1995 Counts	1995 Base Network (NB95)	2010 No-Build Network (NB13)	2010 Transportation Systems Management (T310)	2010 LIRR-to- GCT Build (G310)
AM Peak (6-10 AM)						
Penn Station	2,930	3,000	4,082	4,522	4,837	5,115
Grand Central	0	0	0	0	0	1,108
Hunterspoint Ave	0	0	0	0	0	0
Long Island City	0	0	0	0	0	0
Flatbush Ave	475	1,290	648	480	469	483
Sunnyside	0	0	0	0	0	68
Total	4,290	4,290	4,731	5,001	5,306	6,774
All-Day						
Penn Station	107,410	106,680	108,120	128,860	125,064	75,227
Grand Central	0	0	0	0	0	75,432
Hunterspoint Ave	2,440	2,230	2,525	2,510	3,605	396
Long Island City	98	110	63	20	60	18
Flatbush Ave	9,959	11,300	9,795	10,313	11,088	9,043
Sunnyside	0	0	0	0	0	2,542
Total	119,907	120,320	120,503	141,703	139,817	162,659

Table 4-5 Year 1995 and 2010 AM Peak and All-Day LIRR Arrivals+Departures by Terminal

	1990 Counts	1995 Counts	1995 Base Network (NB95)	2010 No-Build Network (NB13)	2010 Transportation Systems Management (T310)	2010 LIRR-to- GCT Build (G310)
AM Peak (6-10 AM)						
Penn Station	89,880	89,630	90,934	108,378	105,185	63,269
Grand Central	0	0	0	0	0	63,442
Hunterspoint Ave	3,457	2,890	3,279	3,260	4,682	514
Long Island City	195	240	137	44	131	40
Flatbush Ave	13,417	12,960	11,258	11,853	12,744	10,394
Sunnyside	0	0	0	0	0	2,138
Total	106,949	105,720	105,609	123,534	122,741	139,798
All-Day						
Penn Station	213,680	214,250	217,332	259,023	251,392	151,214
Grand Central	0	0	0	0	0	151,626
Hunterspoint Ave	5,897	5,120	5,805	5,769	8,287	911
Long Island City	293	350	199	63	189	58
Flatbush Ave	23,425	25,950	22,517	23,707	25,488	20,788
Sunnyside	0	0	0	0	0	5,110
Total	243,295	245,670	245,852	288,562	285,356	329,706

4.3 Year 2010 Travel Time Savings

Travel time savings is one of the measures used in the Federal Transit Administration's (FTA) Section 5309 Annual Report on New Starts. This computation is performed on each zone-to-zone interchange using matrix computation procedures developed by KPMG for the FTA. The results of the travel time savings computation is presented in Table 4-6. In 2010, the build alternative will save 6.8 million hours annually as compared to the No-Build Alternative

Table 4-6 Year 2010 Weekday and Annual Travel Time Savings

	2010 No-Build Network (NB13)	2010 Transportation Systems Management (T310)	2010 LIRR-to-GCT Build (G310)
WEEKDAY PERSON-HOURS			
TT Savings for Existing Riders			
Out-of-Vehicle Time	0	3,270	25,997
In-Vehicle Time	0	2,984	(3,812)
Total	0	6,254	22,185
TT Savings for New Riders			
Out-of-Vehicle Time	0	205	2,369
In-Vehicle Time	0	(39)	(249)
Total	0	166	2,120
TT Savings for ALL			
Out-of-Vehicle Time	0	3,475	28,366
In-Vehicle Time	0	2,945	(4,061)
Total	0	6,420	24,305
ANNUAL PERSON-HOURS			
Days/Year	282	282	282
TT Savings for Existing Riders			
Out-of-Vehicle Time	0	922,140	7,331,154
In-Vehicle Time	0	841,488	(1,074,984)
Total	0	1,763,628	6,256,170
TT Savings for New Riders			
Out-of-Vehicle Time	0	57,810	668,058
In-Vehicle Time	0	(10,998)	(70,218)
Total	0	46,812	597,840
TT Savings for ALL			
Out-of-Vehicle Time	0	979,950	7,999,212
In-Vehicle Time	0	830,490	(1,145,202)
Total	0	1,810,440	6,854,010

4.4 Year 2010 Distribution of Terminal Station Passengers

Table 4-7 presents the distribution of arriving passengers at Penn Station, Grand Central Terminal and Sunnyside Station. This table shows the number of arriving passengers:

- Walking to each nearby zone
- Transferring to different subway lines
- Transferring to nearby bus services
- Transferring to other rail services at the same terminal.

Table 4-7 Year 2010 AM Peak Period Distribution of Arriving LIRR Passengers by Terminal

	1995 Base Network (NB95)	2010 No-Build Network (NB13)	2010 Transportation Systems Management (T310)	2010 LIRR-to- GCT Build (G310)
PENN STATION				
Walk	50,793	58,837	56,868	31,397
Transfer to Subway				
- A/C/E SB	7,791	8,487	8,149	8,015
- A/C/E NB	11,448	17,407	16,864	3,765
- 1/2/3/9 SB	10,077	12,354	11,838	10,713
- 1/2/3/9 NB	1,834	2,140	2,129	1,944
- B/D/F/Q SB	1,681	1,586	1,536	1,313
- B/D/F/Q NB	1,568	1,069	932	-
- N/R SB	-	763	748	273
- N/R NB	-	-	-	-
Total Transfer to Subway	34,399	43,806	42,196	26,023
Transfer to Bus	223	265	263	8
Transfer to Other Rail	1,436	948	1,021	726
Total	86,851	103,856	100,348	58,154
GRAND CENTRAL				
Walk				51,813
Transfer to Subway				
- 4/5 SB				4,223
- 6 SB				810
- 4/5 NB				683
- 6 NB				1,634
- 7 EB				4
- 7 WB				21
- S				-
Total Transfer to Subway	-	-	-	7,375
Transfer to Bus				2,556
Transfer to Other Rail				589
Total	-	-	-	62,333
SUNNYSIDE				
Walk				1,115
Transfer to Subway				
- 7				169
- F/R				540
- E				5
- N				29
Total Transfer to Subway	-	-	-	743
Transfer to Bus				212
Transfer to Other Rail				-
Total	-	-	-	2,070

4.5 Year 2010 Impacts on Vehicle Trips and Vehicle Miles of Travel

Table 4-8 presents the estimated incremental automobile trips (both auto mode and drive-to-commuter rail) and the estimated incremental Vehicle Miles of Travel.

Table 4-8 Year 2010 Incremental Daily Vehicles and Daily Vehicle Miles of Travel

	(NB13)	(T310)	(G310)
Incremental Vehicle Trips (vs. NB13)			
Incremental Auto Mode Trips	-	(2,819)	(11,165)
Incremental Drive-to-Transit Trips	-	5,232	21,180
Total	-	2,413	10,015
Incremental Vehicle Miles of Travel (vs. NB13)			
Incremental Auto Mode Trips	-	(119,378)	(374,313)
Incremental Drive-to-Transit Trips	-	9,665	32,527
Total	-	(109,713)	(341,786)

5. YEAR 2020 FORECASTING RESULTS

This chapter presents the results of the ridership forecasting models for the 2020 forecast year. Similar results for the 2010 forecast year are presented in Chapter 4. The results presented in this chapter include the impacts of the build and TSM projects on total transit and LIRR ridership (linked trip impacts) and on ridership to each LIRR Manhattan terminal. The difference between total LIRR ridership to GCT and the number of new LIRR linked trips is the number of existing riders diverted from Penn Station or some other terminal to the new service to GCT.

This chapter also presents ridership forecasting results that are used in the development of the draft environmental impact statement. This information includes the distribution of LIRR-to-GCT passengers to different Manhattan Zones for purposes of evaluating pedestrian congestion; vehicle-miles of travel impact, and estimates of parking demand for each station.

5.1 Year 2020 Linked Trip Impacts

One of the best indicators of the ability of a transit project to attract new customers and increase market share is the number of linked trips by mode. Linked trips by mode represent the region-wide total travel from each origin to each destination traveling on each mode. The linked trip tables are a direct outcome of the mode choice model and therefore the modes that can be reported are identical to the modes defined in the mode choice model. These modes are:

- Automobile
- Commuter Rail (including commuter rail/subway trips and commuter rail/bus trips)
- Subway (including subway/bus trips)
- Bus

In the case of the transit mode, each trip is counted once, no matter how many transfers are made or how many transit vehicles are boarded. Accordingly, this measure is directly related to the total travel by transit and provides a realistic basis for comparing alternatives the force many transfers to alternatives that force few transfers.

Table 5-1 presents a comparison of the Year 2020 Weekday (All-Day) Linked Trips by Mode for each of the 2020 scenarios discussed in Chapter 3. This table is stratified by trip purpose as follows:

- HBW – Home-Based Work
- HBO – Home-Based Other
- NHB – Non-Home-Based

Table 5-1 also presents the total (all purposes) incremental linked trips as compared to the No-Build Alternative (NB23). As this table shows, the total number of incremental linked trips for all modes of travel is very nearly equal to zero. This is a result of the fact that a fixed person trip table is used in this travel demand forecasting model and that total travel is constrained to the same number of person trips in any given year.

The number of incremental Year 2020 Weekday Automobile Trips shows that the TSM Alternative is able to reduce automobile travel by 4,100 trips per weekday and the LIRR-to-GCT Alternative is able to reduce Automobile Travel by 15,400 trips per weekday. Conversely, the model results also show that the TSM and LIRR-to-GCT Alternatives add 4,100 and 15,400 new weekday transit riders. This is the “New

Riders-as compared to No-Build” statistic included in the FTA Section 5309 *Annual Report on New Starts*. The number of New Riders as Compared to TSM is the difference between these two figures or 11,300 Daily New Riders.

Table 5-1 also presents an estimate of the number of commuter rail linked trips predicted by the mode choice model. This statistic is similar, but not identical, to the total number of LIRR and MNR trips in the region. It is not identical to the assigned commuter rail volumes since commuter rail trips may be assigned to non-commuter rail services and vice-versa in the capacity-constrained assignment. Nevertheless, the number new commuter rail trips (build versus no-build) predicted by the mode choice model provides an indication of the expected increases in daily LIRR daily trips. In 2020, the mode choice model predicts 32,000 additional daily LIRR linked trips in the LIRR-to-GCT build condition than in the No-Build. In addition, the assignment procedures assign an additional 3,600 non-commuter rail trips in the Build alternative due to the increased availability of LIRR capacity. The number of additional daily LIRR trips is presented in Table 5-2 and is equal to 35,600 additional daily LIRR trips in the Build Alternative as compared to the No-Build.

Table 5-1 Year 1995 and 2020 Weekday (All-Day) Linked Person Trips by Mode and Purpose

		1995 Base Network (NB95)	2020 No-Build Network (NB23)	2020 Transportation Systems Management (TSM3)	2020 LIRR-to- GCT Build (GCT3)
HBW					
	Auto	4,455,549	5,374,457	5,371,487	5,365,829
	Commuter Rail	285,682	392,124	394,942	412,021
	Subway	1,794,233	2,294,061	2,290,079	2,284,697
	Bus	455,831	469,441	473,575	467,535
	Total	6,991,295	8,530,082	8,530,083	8,530,083
HBO					
	Auto	6,450,701	7,187,266	7,186,329	7,181,572
	Commuter Rail	147,258	177,755	178,819	185,967
	Subway	1,065,638	1,239,252	1,238,245	1,237,988
	Bus	758,066	761,046	761,926	759,792
	Total	8,421,663	9,365,319	9,365,319	9,365,318
NHB					
	Auto	1,641,898	1,801,842	1,801,667	1,800,794
	Commuter Rail	57,712	63,142	63,439	66,995
	Subway	489,708	562,863	562,558	560,536
	Bus	128,210	123,100	123,282	122,621
	Total	2,317,528	2,550,947	2,550,946	2,550,946
TOTAL					
	Auto	12,548,148	14,363,565	14,359,483	14,348,195
	Commuter Rail	490,653	633,021	637,199	664,983
	Subway	3,349,579	4,096,176	4,090,882	4,083,221
	Bus	1,342,107	1,353,586	1,358,784	1,349,948
	Total	17,730,486	20,446,347	20,446,348	20,446,347
INCREMENTAL (versus NB23)					
TOTAL					
	Auto		-	(4,082)	(15,370)
	Commuter Rail		-	4,179	31,963
	Subway		-	(5,294)	(12,955)
	Bus		-	5,198	(3,638)
	Total		-	1	(0)

Note: Totals may not add due to rounding.

Table 5-2 2020 Incremental (versus No-Build) Daily LIRR Trips

	2020 No-Build Network (NB23)	2020 Transportation Systems Management (TSM3)	2020 LIRR-to- GCT Build (GCT3)
Commuter Rail Mode	-	4,179	31,963
Other Modes Assigned to Rail	-	(700)	3,630
Total	-	3,479	35,593

5.2 Year 2020 Station Utilization

Another important result of the ridership forecasting process is the number of trips utilizing key facilities that will be affected by the project. This statistic is equivalent to a number of riders that could be counted boarding or alighting at each station or the number of persons on-board trains as they travel to or from each terminal station.

Table 5-3 presents AM Peak 4-Hour (6-10 AM) and estimated daily LIRR riders arriving at each terminal. Table 5-4 and Table 5-5 present similar information for LIRR riders departing each terminal and the sum of arrivals plus departures, respectively.

The first two columns of each table represent passenger counts taken by the LIRR in 1990 and 1995 and are used to confirm the accuracy of the model results. The counts can be compared to the column labeled "NB95" which presents the modeled estimates of Year 1995 LIRR activity at each terminal. As this table shows, the model does an excellent job of representing total (all terminals) daily 1995 LIRR arrivals and departures. The model also does reasonably well in replicating the distribution of activity among individual terminals and travel occurring in the AM Peak 4-Hour Period as a fraction of daily activity.

The next three columns represent forecasted model activity at each terminal for the 2020 No-Build (NB23), the 2020 Transportation Systems Management (TSM3), and 2020 LIRR-to-GCT Build (GCT3) Alternatives. As shown in these tables, total daily passenger activity (arrivals plus departures) for all LIRR terminals is forecasted to increase from 245,900 daily arriving and departing passengers in 1995 to 307,800 in the 2020 No-Build, an increase of 25 percent. The TSM alternative reduces this to 303,700 daily arriving and departing passengers. This decline is largely due to substantial improvements to bus operations on the Long Island Expressway that attracts riders away from the LIRR and to express bus services.

The 2020 LIRR-to-GCT alternative (GCT3) increases total (all terminals) daily LIRR arrivals and departures to 351,000, an increase of 43,200 trips (14.0 percent) over the 2020 No-Build. Daily arrivals and departures at Grand Central Terminal will be 161,500 and the new Sunnyside Station will attract 5,500 daily riders. Activity at Penn Station will drop from 276,100 to 160,700, a drop of 115,300 (-42 percent).

The fact that LIRR terminal volumes increase by 43,200 while total LIRR volumes increases by only 35,600 is caused by a greater percentage of passengers utilizing Terminal Stations in the LIRR-to-GCT Build than in the No-Build. Key examples of this phenomenon are as follows:

- The addition of Sunnyside Station results in a drop of 2,700 daily passengers at Woodside. In effect demand is shifted from LIRR line stations to one of the terminal stations
- About 1,600 daily reverse peak trips are made between Penn Station and Sunnyside. Each such trip results in *two* arrivals or departures at the terminal stations.
- About 1,000 more trips make a rail-to-rail transfer at a terminal station in the Build Case than in the No-Build. Each such trip results in *two* arrivals or departures at the terminal stations.
- The service plan used to simulate the impact of LIRR service to GCT results in a modest drop in LIRR volumes to other non-terminal stations of approximately 1,200 intra-Long Island trips
- Approximately 1,800 trips are lost due to different peak period-to-daily factors being used at Hunterspoint and Flatbush Avenue represent the low (or non-existent) peak period utilization at these stations.

Table 5-3 Year 1995 and 2020 AM Peak and All-Day LIRR Arrivals by Terminal

	1990 Counts	1995 Counts	1995 Base Network (NB95)	2020 No-Build Network (NB23)	2020 Transportation Systems Management (TSM3)	2020 LIRR-to- GCT Build (GCT3)
AM Peak (6-10 AM)						
Penn Station	86,950	86,630	86,851	110,522	106,849	62,249
Grand Central	0	0	0	0	0	65,676
Hunterspoint Ave	3,457	2,890	3,279	3,598	5,098	603
Long Island City	195	240	137	46	138	43
Flatbush Ave	12,942	11,670	10,610	12,144	13,049	10,519
Sunnyside	0	0	0	0	0	2,255
Total	103,544	101,430	100,878	126,310	125,135	141,345
All-Day						
Penn Station	106,270	107,570	109,212	138,727	134,341	80,777
Grand Central	0	0	0	0	0	81,140
Hunterspoint Ave	3,457	2,890	3,279	3,598	5,098	603
Long Island City	195	240	136	46	137	42
Flatbush Ave	13,466	14,650	12,721	14,285	15,313	12,493
Sunnyside	0	0	0	0	0	2,765
Total	123,388	125,350	125,349	156,656	154,889	177,819

Table 5-4 Year 1995 and 2020 AM Peak and All-Day LIRR Departures by Terminal

	1990 Counts	1995 Counts	1995 Base Network (NB95)	2020 No-Build Network (NB23)	2020 Transportation Systems Management (TSM3)	2020 LIRR-to- GCT Build (GCT3)
AM Peak (6-10 AM)						
Penn Station	2,930	3,000	4,082	4,987	5,008	5,008
Grand Central	0	0	0	0	0	1,884
Hunterspoint Ave	0	0	0	0	0	0
Long Island City	0	0	0	0	0	0
Flatbush Ave	475	1,290	648	499	502	537
Sunnyside	0	0	0	0	0	47
Total	3,405	4,290	4,731	5,486	5,510	7,476
All-Day						
Penn Station	107,410	106,680	108,120	137,340	132,997	79,969
Grand Central	0	0	0	0	0	80,329
Hunterspoint Ave	2,440	2,230	2,525	2,770	3,926	464
Long Island City	98	110	63	21	63	19
Flatbush Ave	9,959	11,300	9,795	10,999	11,791	9,619
Sunnyside	0	0	0	0	0	2,737
Total	119,907	120,320	120,503	151,131	148,777	173,138

Table 5-5 Year 1995 and 2020 AM Peak and All-Day LIRR Arrivals+Departures by Terminal

	1990 Counts	1995 Counts	1995 Base Network (NB95)	2020 No-Build Network (NB23)	2020 Transportation Systems Management (TSM3)	2020 LIRR-to- GCT Build (GCT3)
AM Peak (6-10 AM)						
Penn Station	89,880	89,630	90,934	115,509	111,857	67,258
Grand Central	0	0	0	0	0	67,560
Hunterspoint Ave	3,457	2,890	3,279	3,598	5,098	603
Long Island City	195	240	137	46	138	43
Flatbush Ave	13,417	12,960	11,258	12,642	13,552	11,056
Sunnyside	0	0	0	0	0	2,302
Total	106,949	105,720	105,609	131,795	130,645	148,821
All-Day						
Penn Station	213,680	214,250	217,332	276,067	267,338	160,746
Grand Central	0	0	0	0	0	161,469
Hunterspoint Ave	5,897	5,120	5,805	6,368	9,024	1,066
Long Island City	293	350	199	67	200	62
Flatbush Ave	23,425	25,950	22,517	25,285	27,104	22,112
Sunnyside	0	0	0	0	0	5,503
Total	243,295	245,670	245,852	307,786	303,666	350,957

5.3 Year 2020 Travel Time Savings

Travel time savings is one of the measures used in the Federal Transit Administration's (FTA) Section 5309 Annual Report on New Starts. This computation is performed on each zone-to-zone interchange using matrix computation procedures developed by KPMG for the FTA. The results of the travel time savings computation is presented in Table 5-6. In 2020, the build alternative will save 7.4 million hours annually as compared to the No-Build Alternative.

Table 5-6 Year 2020 Weekday and Annual Travel Time Savings

		2020 No-Build Network (NB23)	2020 Transportation Systems Management (TSM3)	2020 LIRR-to-GCT Build (GCT3)
WEEKDAY PERSON-HOURS				
TT Savings for Existing Riders				
	Out-of-Vehicle Time	0	3,499	27,653
	In-Vehicle Time	0	2,283	(3,642)
	Total	0	5,782	24,011
TT Savings for New Riders				
	Out-of-Vehicle Time	0	213	2,594
	In-Vehicle Time	0	91	(334)
	Total	0	304	2,260
TT Savings for ALL				
	Out-of-Vehicle Time	0	3,712	30,247
	In-Vehicle Time	0	2,374	(3,976)
	Total	0	6,086	26,271
ANNUAL PERSON-HOURS				
Days/Year		282	282	282
TT Savings for Existing Riders				
	Out-of-Vehicle Time	0	986,718	7,798,146
	In-Vehicle Time	0	643,806	(1,027,044)
	Total	0	1,630,524	6,771,102
TT Savings for New Riders				
	Out-of-Vehicle Time	0	60,066	731,508
	In-Vehicle Time	0	25,662	(94,188)
	Total	0	85,728	637,320
TT Savings for ALL				
	Out-of-Vehicle Time	0	1,046,784	8,529,654
	In-Vehicle Time	0	669,468	(1,121,232)
	Total	0	1,716,252	7,408,422

5.4 Year 2020 Distribution of Terminal Station Passengers

Table 5-7 presents the distribution of arriving passengers at Penn Station, Grand Central Terminal and Sunnyside Station. This table shows the number of arriving passengers:

- Walking to each nearby zone
- Transferring to different subway lines
- Transferring to nearby bus services
- Transferring to other rail services at the same terminal.

Table 5-7 Year 2020 AM Peak Period Distribution of Arriving LIRR Passengers by Terminal

	1995 Base Network (NB95)	2020 No-Build Network (NB23)	2020 Transportation Systems Management (TSM3)	2020 LIRR-to- GCT Build (GCT3)
PENN STATION				
Walk	50,793	63,021	60,784	33,856
Transfer to Subway				
- A/C/E SB	7,791	8,870	8,575	8,369
- A/C/E NB	11,448	18,432	17,909	4,128
- 1/2/3/9 SB	10,077	13,027	12,581	11,383
- 1/2/3/9 NB	1,834	2,262	2,257	2,076
- B/D/F/Q SB	1,681	1,684	1,645	1,399
- B/D/F/Q NB	1,568	1,107	941	-
- N/R SB	-	797	782	285
- N/R NB	-	-	-	-
Total Transfer to Subway	34,399	46,179	44,690	27,640
Transfer to Bus	223	281	277	8
Transfer to Other Rail	1,436	1,071	1,098	745
Total	86,851	110,552	106,849	62,249
GRAND CENTRAL				
Walk				54,433
Transfer to Subway				
- 4/5 SB				4,485
- 6 SB				842
- 4/5 NB				583
- 6 NB				1,646
- 7 EB				4
- 7 WB				23
- S				-
Total Transfer to Subway	-	-	-	7,583
Transfer to Bus				3,027
Transfer to Other Rail				633
Total	-	-	-	65,676
SUNNYSIDE				
Walk				1,254
Transfer to Subway				
- 7				169
- F/R				572
- E				5
- N				32
Total Transfer to Subway	-	-	-	778
Transfer to Bus				223
Transfer to Other Rail				-
Total	-	-	-	2,255

5.5 Year 2020 Impacts on Vehicle Trips and Vehicle Miles of Travel

Table 5-8 presents the estimated incremental automobile trips (both auto mode and drive-to-commuter rail) and the estimated incremental Vehicle Miles of Travel.

Table 5-8 Year 2020 Incremental Daily Vehicle Trips and Daily Vehicle Miles of Travel

	2020 No-Build Network (NB23)	2020 Transportation Systems Management (TSM3)	2020 LIRR-to- GCT Build (GCT3)
<hr/>			
Incremental Vehicle Trips (vs. NB23)			
Incremental Auto Mode Trips	-	(3,401)	(12,087)
Incremental Drive-to-Transit Trips	-	4,039	23,413
Total	-	638	11,325
Incremental Vehicle Miles of Travel (vs. NB23)			
Incremental Auto Mode Trips	-	(128,772)	(410,583)
Incremental Drive-to-Transit Trips	-	9,182	35,921
Total	-	(119,590)	(374,662)

6. ASSESSMENT OF FORECAST RISKS

The ridership forecasts presented in this report are based on travel demand forecasting models that represent existing travel patterns and behavior and attempt to predict behavior in a future year based on assumptions regarding population and employment, the transportation system, fare policy, and other transportation-related policies. Like any forecast of the future, the reliability of these forecasts is related to the accuracy and appropriateness of the analytical techniques and the underlying assumptions.

The forecasting techniques and assumptions used in these forecasts are the result of a collaborative effort of the Long Island Rail Road, the Metropolitan Transportation Authority and its operating agencies, and KPMG LLP. This effort has stressed the need to maintain a consistent set of methodologies and assumptions among all of the on-going transit planning projects in the region. The forecasts of population, employment, and total travel which serve as input assumptions for the LIRR ESA DEIS forecasts may or may not be realized and consequently, the forecasts of ridership for the new service may or may not occur. The consistency of the assumptions between different alternatives and between different projects means that the resulting forecasts should be useful in the process of ranking each alternative and each project.

Some of the most important assumptions and their impact on forecasted ridership are described below. Additionally, independent observations used to confirm the reasonableness of the various forecast results are also presented.

1. **Sensitivity to Socioeconomic Factors.** The county-level population and employment forecasts are based on the adopted NYMTC forecasts for 2010 and 2020. NYMTC used these forecasts to develop projections of county-to-county journey-to-work travel for 1990, 1995, 2010, and 2020. The resulting journey-to-work forecasts were used as the basis for the projected growth in commuter travel in this report. The NYMTC journey-to-work forecasts show the following percentage increases in travel to Manhattan:

Table 6-1 Summary of Forecasted Journey-to-Work Growth by County

Origin County	1995	2010		2020	
	JTW	JTW	%Change	JTW	%Change
Queens	318,051	366,818	15.3%	380,610	19.7%
Nassau	96,676	112,706	16.6%	117,188	21.2%
Suffolk	35,112	46,625	32.8%	51,011	45.3%

The forecasted rate of growth has a direct impact on future year LIRR ridership. For example, if the actual growth in Suffolk-to-Manhattan journey-to-work is only 23 percent between 1995 and 2020, then LIRR ridership from Suffolk to Manhattan will only grow by half of the forecasted amount during that same time period.

2. **Sensitivity to Fare Policy.** The fares assumed for 2010 and 2020 are based on current MTA policies that indicate that commuter rail fares will remain unchanged between November 1995 and the Year 2000. No adopted MTA fare policy exists beyond the Year 2000. All MTA Long Range Planning Framework projects have assumed that after the Year 2000, fares will rise in proportion to the Consumer Price Index. This assumption results in a drop in real fares (as measured in constant year dollars) between Spring-Early Fall 1995 and the Year 2020 (or 2010) of between 3 and 4 percent (depending on location).

The sensitivity to fare that is built into the model is based on stated preference survey research conducted by MVA Consultancy for the Lower Manhattan Project and indicates that every 10 cents of fare is worth 0.75 minutes of travel time. Another way of expressing this relationship is that each hour of time is worth \$8.00. These results are consistent with those used in similar models used elsewhere in the United States. The effect of the assumed drop in fare between 1995 and the forecast years is approximately the same as assuming that each travel is able to save one minute over the equivalent trip in 1995. If the fare policy in 2010 or 2020 changes then the forecasted ridership would be expected to change as well.

3. **Sensitivity to Service Plan.** Forecasts of ridership to Grand Central Terminal included in this report are based on preliminary service plans developed by Systra Consulting, Inc. in April 1999. These service plans are continuing to evolve and will be updated shortly. The distribution of travelers to Penn Station and to Grand Central is highly sensitive to the relative level-of-service offered from each origin station to each Manhattan terminal. Preliminary runs of the current demand forecasting model that differed only in the mix of express and local trains on each branch to Penn Station and Grand Central Terminal indicated a substantial range in the forecasted ridership to Grand Central Terminal. In particular, forecasted AM Peak 4-Hour LIRR arrivals at Grand Central Terminal varied from 60,000 to 68,000 based solely on the assumed stopping patterns for each train serving Grand Central Terminal. At present, a final schedule showing stopping patterns for each train has not been developed and therefore, the forecasts of LIRR ridership to Grand Central Terminal may change over time.
4. **Sensitivity of Model to Work Locations Within Manhattan.** The methodology used to prepare forecasts of customer choice between Penn Station and Grand Central Terminal is based on a network model calibrated to replicate the choices made between Hunterspoint Avenue, Long Island City, Flatbush Avenue, and Penn Station. The ability of the model to properly predict the ridership impacts to Grand Central Terminal is dependent on:
 - Consistency between traveler response in 1995 to the LIRR terminal choices then available and the future year choice between Penn Station and Grand Central Terminal.
 - The distribution of existing and future travel destinations within Manhattan (e.g., East Midtown versus West Midtown versus Lower Manhattan)

The model forecasts that in 2020, LIRR travel to Manhattan will be divided as follows:

- Penn Station: 44 percent
- Grand Central Terminal: 46 percent
- Other terminals: 10 percent

By contrast, in 1990, Penn Station attracted 86.5 percent of the LIRR trips to Manhattan and in 2020 with dual mode trains (but without Grand Central Terminal), Penn Station is expected to attract 87.5 percent of LIRR travel to Manhattan.

As shown in Table 6-2, below, the model has assigned travel to Grand Central Terminal in rough proportion to the distribution of travel in 1990 to the East Midtown and Upper East Side areas of Manhattan—the principal markets for this service. The model assumes relatively little travel to Lower Manhattan will travel through Grand Central Terminal. This suggests that the modeled distribution of travelers between Penn Station and GCT is consistent with the underlying Census distribution of travel.

Table 6-2 Distribution of 1990 LIRR Attractions by Location Within Manhattan

Location	Attractions	Percent
East Midtown/Upper East Side	88,913	44%
West Midtown/Upper West Side	58,585	29%
Lower Manhattan	54,777	27%
	202,275	100%

Source: 1990 Person Trip Tables Derived from 1990 Census Transportation Planning Package

5. **Reasonableness of the Modeling Approach.** The forecasted ridership is a direct outcome of the analytical techniques that comprise the model. Like any analytical technique, the model is a simplification of very complex behavior and consequently, the results should be (and have been) checked for reasonableness. Perhaps the best independent check of the model reasonableness is to check the results of the LIRR to GCT forecasts against stated preference survey research conducted in earlier studies. In a 1986 survey conducted for the LIRR, the Caliper Corporation¹ estimated that approximately 42 percent of the then current riders would prefer to travel to GCT over Penn Station and that another 15 percent indicated that they might shift from Penn Station to Grand Central. About 37 percent of all existing non-LIRR riders to Manhattan would consider switching to the LIRR if an East Side Terminal were available.

The model forecasts are reasonably consistent with this survey finding. The model shows a Grand Central-Penn Station split of 51-49. If all of the surveyed travelers who prefer Grand Central and half of those who said they might shift to Grand Central were to actually shift, then according to the survey, this split should be 50-50.

The model shows that the introduction of LIRR service to Grand Central will increase LIRR ridership to Manhattan terminal by 11 percent. By comparison, given the LIRR share of travel from Nassau and Suffolk Counties (67 percent in 1990) and the assumption that half of the survey non-riders who would consider shifting would actually shift to the LIRR, the survey implies that LIRR ridership should grow by approximately 9 percent.

These results suggest that the model approximately replicates an independent survey of LIRR customer stated preference.

¹ Caliper Corporation, *East Side Access Study Final Report*, June 10, 1986.

APPENDIX

DETAILED TABLES OF RESULTS

Table A-1

AM PEAK WEEKDAY 4-HOUR ARRIVALS AND DEPARTURES BY STATION

STATION LOCATION	1990 Counts	1995 Counts	BASE	YEAR 2010 ALTERNATIVES				YEAR 2020 ALTERNATIVES			
				1995 BASE NETWORK (NB95)	2010 NO-BUILD (NB13)	2010 TSM (T310)	2010 LIRR-GCT BUILD (G310)	2020 NO-BUILD (NB23)	2020 TSM (TSM3)	2020 LIRR-GCT BUILD (GCT3)	
COMMUTER RAIL											
LIRR											
Arrivals											
Penn Station	86,950	86,630	86,851		103,856	100,348	58,154	110,522	106,849	62,249	
Grand Central			0		0	0	62,334	0	0	65,676	
Hunterspoint	3,457	2,890	3,279		3,260	4,682	514	3,598	5,098	603	
Long Island City	195	240	137		44	131	40	46	138	43	
Flatbush (adj for 2-way)	12,942	10,336	10,610		11,374	12,275	9,911	12,144	13,049	10,519	
Sunnyside			0		0	0	2,070	0	0	2,255	
Total	103,544	100,096	100,878		118,533	117,435	133,024	126,310	125,135	141,345	
Departure: Penn Station											
Grand Central	2,930	3,000	4,082		4,522	4,837	5,115	4,987	5,008	5,008	
Hunterspoint			0		0	0	1,108	0	0	1,884	
Long Island City			0		0	0	0	0	0	0	
Flatbush Avenue			0		0	0	0	0	0	0	
Sunnyside	475	1,290	648		480	469	483	499	502	537	
Total	3,405	4,290	4,731		5,001	5,306	6,774	5,486	5,510	7,476	
MNR											
Arrivals											
Grand Central	66,763	70,169	70,346		84,164	84,150	84,153	88,738	88,737	88,811	
125th Street			2,703		2,924	2,926	2,924	3,171	3,052	3,167	
Total			73,049		87,088	87,075	87,078	91,909	91,789	91,978	
Departure: Grand Central											
125th Street	2,675	4,064	2,461		3,024	3,026	3,111	3,099	3,105	3,198	
Total			926		969	970	973	1,050	980	1,043	
			3,387		3,993	3,996	4,084	4,149	4,085	4,241	
STATEN ISLAND FERRY											
Arrivals		18,993	18,617		35,162	35,308	35,253	35,142	35,227	35,158	
Whitehall Terminal											
Departure: Whitehall Terminal		1,389	1,926		2,826	2,830	2,830	3,076	3,079	3,077	

Table A-2

AM PEAK WEEKDAY 4-HOUR 60TH STREET SUBWAY SCREENLINE CROSSINGS

STATION LOCATION	1990 Counts	1995 Counts	BASE	YEAR 2010 ALTERNATIVES			YEAR 2020 ALTERNATIVES			
				1995 BASE NETWORK (NB95)	2010 NO-BUILD (NB13)	2010 TSM (T310)	2010 LIRR-GCT BUILD (G310)	2020 NO-BUILD (NB23)	2020 TSM (TSM3)	2020 LIRR-GCT BUILD (GCT3)
SUBWAY										
60TH STREET										
In										
IRT Lexington Express	77,312	79,819	83,873	90,704	90,992	90,712	95,114	95,360	94,836	
IRT Lexington Local	48,830	45,819	50,108	50,425	50,569	50,617	52,293	52,425	52,746	
IND 8th Ave Express	52,068	62,315	45,494	49,828	49,839	49,923	52,535	52,565	52,502	
IND 8th Ave Local	15,591	18,683	26,290	29,513	29,495	29,336	30,628	30,446	30,344	
IRT Broadway Express	61,171	54,762	49,273	58,823	58,449	59,019	61,431	61,053	61,300	
IRT Broadway Local	38,248	42,015	53,490	61,518	61,591	61,282	63,059	63,207	63,409	
Total	293,220	303,413	308,528	340,811	340,935	340,889	355,060	355,056	355,136	
Out										
IRT Lexington Express	17,698	26,000	26,210	31,826	31,850	32,279	32,923	33,116	33,811	
IRT Lexington Local	30,685	29,834	36,961	37,143	37,396	37,622	38,496	38,560	38,610	
IND 8th Ave Express	13,436	10,549	27,209	35,500	35,472	34,917	36,963	36,982	36,340	
IND 8th Ave Local	3,737	5,457	8,372	10,469	10,417	10,140	10,720	10,633	10,365	
IRT Broadway Express	17,201	16,803	19,846	12,404	12,409	12,267	12,815	12,800	12,672	
IRT Broadway Local	16,378	15,770	7,753	20,159	20,163	20,147	20,843	20,906	20,862	
Total	99,135	104,413	126,350	147,501	147,708	147,373	152,759	152,996	152,660	

Table A-3

AM PEAK WEEKDAY 4-HOUR BROOKLYN SUBWAY SCREENLINE CROSSINGS

STATION LOCATION		1990 Counts		1995 Counts	BASE	YEAR 2010 ALTERNATIVES				YEAR 2020 ALTERNATIVES			
		NYMTC Hub-Bound	NYMTC Hub-Unbound	NYMTC	1995 BASE NETWORK (NB95)	2010 NO-BUILD (NB13)	2010 TSM (T310)	2010 LIRR-GCT BUILD (G310)	2020 NO-BUILD (NB23)	2020 TSM (TSM3)	2020 LIRR-GCT BUILD (GCT3)		
SUBWAY													
BROOKLYN	In												
	BMT 14th St Tunnel	26,999	28,516	28,266		35,048	35,049	35,030	36,543	36,643	36,677		
	BMT Williamsburg Br	28,584	26,832	34,085		41,645	41,289	41,728	43,637	43,324	43,583		
	IND Rutgers Tunnel	23,085	29,536	27,371		36,860	36,624	36,767	38,288	38,146	38,303		
	BMT Manhattan Br	76,882	64,339	62,672		81,553	83,010	82,635	86,710	86,892	87,518		
	IND Cranberry Tun	58,681	69,096	63,825		62,716	62,843	62,530	65,761	65,791	65,548		
	IND Clark Tunnel	43,354	31,950	28,496		32,004	32,052	31,791	33,715	33,526	33,274		
	BMT Montague Tunnel	27,629	35,217	21,015		37,718	36,379	36,495	37,472	37,601	36,915		
	IRT Joralemon Tunnel	69,030	56,496	54,090		56,587	57,249	55,606	58,588	59,237	57,272		
	Total	354,244	341,982	319,819		384,131	384,495	382,583	400,714	401,161	399,091		
	Out	BMT 14th St Tunnel	6,923	5,979	8,619		10,283	10,122	10,264	10,722	10,556	10,708	
		BMT Williamsburg Br	3,379	3,097	6,387		6,376	6,368	6,378	6,627	6,641	6,644	
		IND Rutgers Tunnel	6,931	7,900	10,970		8,758	8,814	8,855	9,777	9,726	9,623	
BMT Manhattan Br		9,510	8,297	6,906		9,704	9,692	9,728	10,220	10,212	10,239		
IND Cranberry Tun		9,538	10,297	8,915		8,082	8,102	8,088	8,637	8,630	8,596		
IND Clark Tunnel		6,709	6,692	4,790		4,938	4,908	4,900	5,166	5,144	5,165		
BMT Montague Tunnel		4,092	5,959	3,930		8,462	8,409	8,445	8,881	8,869	8,895		
IRT Joralemon Tunnel		8,678	11,155	8,725		8,943	8,865	8,840	9,214	9,260	9,419		
Total		55,760	59,376	59,242		65,546	65,280	65,498	69,243	69,038	69,289		

Table A-4
AM PEAK WEEKDAY 4-HOUR QUEENS SUBWAY & BUS SCREENLINE CROSSINGS

STATION LOCATION	1990 Counts		1995 Counts	BASE	YEAR 2010 ALTERNATIVES				YEAR 2020 ALTERNATIVES			
	NYMTC Hub-Bound	NYMTC Hub-Bound	NYMTC Hub-Bound	1995 BASE NETWORK (NB95)	2010 NO-BUILD (NB13)	2010 TSM (T310)	2010 LIRR-GCT BUILD (G310)	2020 NO-BUILD (NB23)	2020 TSM (TSM3)	2020 LIRR-GCT BUILD (GCT3)		
SUBWAY												
QUEENS												
In												
BMT 60th St	61,905	63,035		66,317	67,260	67,204	67,273	70,652	70,848	70,368		
IND 53rd St	113,246	116,516		116,575	98,071	97,688	96,243	102,343	102,222	100,750		
IRT Steinway	63,217	54,171		56,804	96,944	99,902	91,886	100,861	103,736	95,753		
63rd St Tunnel	3,143	3,560		3,277	37,503	37,570	36,445	39,661	39,422	38,354		
Total	241,511	237,282		242,973	299,778	302,364	291,847	313,517	316,228	305,226		
Out												
BMT 60th St	10,369	9,227		10,122	6,851	6,907	6,947	7,429	7,511	7,503		
IND 53rd St	18,950	16,284		16,727	23,519	23,362	23,123	25,047	25,015	24,782		
IRT Steinway	13,270	12,858		13,626	15,728	15,726	15,599	16,919	16,901	16,658		
63rd St Tunnel	1,994	2,457		9,553	14,805	14,578	13,722	15,465	15,182	14,361		
Total	44,583	40,826		50,028	60,904	60,573	59,391	64,859	64,609	63,304		
BUS												
In												
Brooklyn Battery Tun.	17,069	14,025		17,009	13,983	13,883	13,902	13,905	13,823	13,855		
Manhattan Bridge	463	325		14	6	6	6	5	5	5		
Queensboro Bridge	2,300	2,232		658	579	580	679	607	625	707		
Queens Midtown Tun.	12,094	9,364		5,243	1,400	2,261	1,140	1,466	2,344	1,176		
Williamsburg Bridge	180	293		6	0	0	0	0	0	0		
60th Street	30,726	24,280		27,630	18,804	18,745	18,856	19,227	19,137	19,289		
Total	62,832	50,519		50,560	34,772	35,475	34,583	35,210	35,934	35,032		
Out												
Brooklyn Battery Tun.	72			0	0	0	0	0	0	0		
Manhattan Bridge	128			1	0	0	0	0	0	0		
Queensboro Bridge	690			468	263	248	281	272	271	275		
Queens Midtown Tun.	349			0	0	0	0	0	0	0		
Williamsburg Bridge	247			0	1	1	1	1	1	1		
60th Street	8,597			7,298	7,701	7,704	8,213	7,871	7,902	8,423		
Total	10,083			7,767	7,965	7,953	8,495	8,144	8,174	8,699		

Table A-5
WEEKDAY (ALL-DAY) LINKED PERSON TRIPS BY MODE

	BASE	YEAR 2010 ALTERNATIVES			YEAR 2020 ALTERNATIVES		
		2010 NO-BUILD (NB13)	2010 TSM (T310)	2010 LIRR-GCT BUILD (G310)	2020 NO-BUILD (NB23)	2020 TSM (TSM3)	2020 LIRR-GCT BUILD (GCT3)
PERSON TRIPS BY MODE (INTRAZONAL TRIPS EXCLUDED)							
HBW							
Auto	4,455,549	4,898,639	4,896,172	4,890,530	5,374,457	5,371,487	5,365,829
Commuter Rail	285,682	368,126	371,172	386,916	392,124	394,942	412,021
Subway	1,794,233	2,185,990	2,181,888	2,176,926	2,294,061	2,290,079	2,284,697
Bus	455,831	443,267	446,791	441,652	469,441	473,575	467,535
Total	6,991,295	7,896,022	7,896,023	7,896,024	8,530,082	8,530,083	8,530,083
HBO							
Auto	6,450,701	6,763,135	6,762,488	6,757,846	7,187,266	7,186,329	7,181,572
Commuter Rail	147,258	167,406	169,184	174,621	177,755	178,819	185,967
Subway	1,065,638	1,198,240	1,197,107	1,197,121	1,239,252	1,238,245	1,237,988
Bus	758,066	734,394	734,396	733,587	761,046	761,926	759,792
Total	8,421,663	8,863,175	8,863,176	8,863,175	9,365,319	9,365,319	9,365,318
NHB							
Auto	1,641,898	1,704,763	1,704,469	1,703,962	1,801,842	1,801,667	1,800,794
Commuter Rail	57,712	59,383	60,296	62,547	63,142	63,439	66,995
Subway	489,708	546,901	546,344	544,837	562,863	562,558	560,536
Bus	128,210	118,854	118,791	118,555	123,100	123,282	122,621
Total	2,317,528	2,429,901	2,429,901	2,429,901	2,550,947	2,550,946	2,550,946
TOTAL							
Auto	12,548,148	13,366,537	13,363,129	13,352,338	14,363,565	14,359,483	14,348,195
Commuter Rail	490,653	594,915	600,652	624,084	633,021	637,199	664,983
Subway	3,349,579	3,931,131	3,925,339	3,918,884	4,096,176	4,090,882	4,083,221
Bus	1,342,107	1,296,515	1,299,979	1,293,794	1,353,586	1,358,784	1,349,948
Total	17,730,486	19,189,098	19,189,099	19,189,100	20,446,347	20,446,348	20,446,347
INCREMENTAL (INTRAZONAL TRIPS EXCLUDED)							
TOTAL							
Auto	0	0	(3,408)	(14,199)	0	(4,082)	(15,370)
Commuter Rail	0	0	5,738	29,169	0	4,179	31,963
Subway	0	0	(5,793)	(12,247)	0	(5,294)	(12,955)
Bus	0	0	3,464	(2,722)	0	5,198	(3,638)
Total	0	0	1	1	0	1	(0)

Table A-6

AM PEAK PERIOD (6-10AM) DISTRIBUTION OF LIRR ARRIVING PASSENGERS AT PENN STATION

	1995 BASE NETWORK (NB95)	2010 NO-BUILD (NB13)	2010 TSM (T310)	2010 LIRR-GCT BUILD (G310)	2020 NO-BUILD (NB23)	2020 TSM (TSM3)	2020 LIRR-GCT BUILD (GCT3)
WALK TO FINAL DESTINATION							
85	74.78	71.57	68.85	71.35	73.47	70.53	72.84
92	0.14	0.13	0.13	135.48	0.14	0.14	143.10
93	171.18	174.88	167.96	175.65	187.97	180.17	187.79
94	1,216.41	1,230.10	1,182.06	1,235.71	1,319.95	1,265.84	1,318.84
97	2,411.80	2,399.18	2,305.87	2,431.82	2,520.20	2,417.28	2,540.72
98	413.70	679.41	654.24	704.70	717.54	689.57	739.91
111	191.14	198.80	199.30	0.00	208.47	208.60	0.00
114	0.04	41.97	40.33	0.00	44.76	42.91	0.00
115	234.98	238.57	231.53	0.00	251.63	243.69	0.00
116	587.74	586.63	579.90	0.00	616.79	608.69	0.00
117	1,740.67	1,760.84	1,748.56	0.00	1,851.03	1,834.90	0.00
118	1,060.27	1,027.36	986.61	439.80	1,078.98	1,034.12	458.92
119	1,763.46	1,787.27	1,722.80	0.00	1,872.29	1,801.09	0.00
120	3,023.73	3,008.99	2,895.67	0.00	3,142.89	3,018.38	0.00
121	2,414.67	2,315.42	2,224.94	2,344.37	2,420.20	2,320.95	2,437.07
122	0.48	1,301.92	1,250.89	1,315.67	1,371.51	1,315.10	1,378.35
123	1,689.91	1,646.22	1,588.56	1,762.76	1,715.85	1,652.32	1,825.80
124	3,112.09	3,582.91	3,448.26	3,636.98	3,996.91	3,838.75	4,034.47
125	887.37	996.37	964.09	998.28	1,110.06	1,071.92	1,106.11
126	1,904.33	1,841.57	1,768.56	1,856.24	1,905.26	1,826.02	1,909.95
127	1,625.11	1,564.63	1,504.44	1,562.13	1,616.44	1,551.09	1,605.30
128	504.49	539.68	518.86	545.12	575.80	552.48	578.55
129	2,344.84	2,499.58	2,404.03	2,528.86	2,659.21	2,552.29	2,675.88
130	259.71	265.08	254.55	265.41	279.88	268.20	278.74
131	176.62	198.06	190.29	199.85	210.36	201.70	211.14
132	67.50	103.81	99.95	100.89	139.56	134.07	134.76
133	459.65	703.92	676.64	707.79	947.70	909.07	947.30
134	0.74	830.66	799.17	837.43	945.45	907.73	947.88
135	650.35	626.09	602.43	626.23	708.40	680.24	704.66
136	349.47	527.92	507.37	539.71	715.29	686.02	727.12
137	1.50	52.25	50.53	53.25	59.61	57.54	60.42
138	0.07	529.76	511.49	536.04	556.36	536.07	559.88
139	496.28	475.07	457.82	495.07	546.27	525.38	566.19
140	234.67	211.00	202.97	223.75	241.88	232.17	254.96
141	0.00	264.37	254.94	273.72	304.18	292.71	313.19
142	0.39	337.86	325.11	343.31	352.79	338.80	356.51
143	454.52	446.38	429.91	452.61	469.32	451.08	473.34
144	1,060.55	1,195.09	1,151.47	1,245.85	1,305.21	1,254.94	1,352.60
145	1,117.34	1,230.06	1,185.71	1,261.29	1,330.04	1,279.41	1,356.00
146	1,678.74	1,858.55	1,791.22	252.54	2,017.43	1,940.35	272.35
147	307.87	340.63	327.70	55.29	369.10	354.37	59.55
148	1,320.52	1,334.46	1,286.04	0.00	1,435.21	1,380.27	0.00
149	1,122.11	1,101.89	1,060.98	551.09	1,184.14	1,137.86	588.68
150	603.84	614.16	591.97	118.68	664.20	638.90	126.75

(CONTINUED)

Table A-6

AM PEAK PERIOD (6-10AM) DISTRIBUTION OF LIRR ARRIVING PASSENGERS AT PENN STATION
(CONTINUED)

	1995 BASE NETWORK (NB95)	2010 NO-BUILD (NB13)	2010 TSM (T310)	2010 LIRR-GCT BUILD (G310)	2020 NO-BUILD (NB23)	2020 TSM (TSM3)	2020 LIRR-GCT BUILD (GCT3)
WALK TO FINAL DESTINATION							
151	0.00	950.98	916.74	512.28	1,021.64	982.84	550.36
152	725.91	710.54	682.88	0.00	757.24	726.26	0.00
153	0.52	0.00	0.00	0.00	0.00	0.00	0.00
154	3,733.60	4,019.08	3,889.25	0.00	4,347.92	4,198.51	0.00
155	3,562.18	3,464.24	3,354.75	0.00	3,608.98	3,487.65	0.00
156	2,224.37	2,232.98	2,208.07	0.00	2,335.28	2,305.17	0.00
157	0.00	1,121.23	1,098.94	0.00	1,164.56	1,139.36	0.00
158	0.00	0.00	0.00	0.00	0.00	0.00	0.00
159	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00
161	1,160.16	1,151.68	1,108.86	0.00	1,201.73	1,154.74	0.00
162	224.80	220.89	214.81	0.00	230.89	224.04	0.00
163	0.00	197.69	192.15	0.00	205.04	198.88	0.00
164	0.00	559.50	537.63	0.00	581.82	558.00	0.00
165	144.47	147.74	144.28	0.00	155.98	152.02	0.00
166	0.00	0.00	0.00	0.00	0.00	0.00	0.00
167	0.00	52.84	50.80	0.00	54.74	52.51	0.00
168	686.47	641.96	640.67	0.00	664.79	662.41	0.00
169	553.91	537.06	529.54	0.00	557.80	549.03	0.00
170	40.86	87.52	83.93	0.00	92.88	88.90	0.00
TOTAL	50,793.00	58,837.00	56,868.00	31,397.00	63,021.00	60,784.00	33,856.00
TRANSFERS TO SUBWAY							
Subway Routes A/C/E SB	7,791	8,487	8,149	8,015	8,870	8,575	8,369
Subway Routes A/C/E NB	11,448	17,407	16,864	3,765	18,432	17,909	4,128
Subway Routes 1/2/3/9 SB	10,077	12,354	11,838	10,713	13,027	12,581	11,383
Subway Routes 1/2/3/9 NB	1,834	2,140	2,129	1,944	2,262	2,257	2,076
Subway Routes B/D/F/Q SB	1,681	1,586	1,536	1,313	1,684	1,645	1,399
Subway Routes B/D/F/Q NB	1,568	1,069	932	-	1,107	941	-
Subway Routes N/R SB	-	763	748	273	797	782	285
Subway Routes N/R NB	-	-	-	-	-	-	-
TOTAL TO SUBWAY	34,399	43,806	42,196	26,023	46,179	44,690	27,640
TOTAL BUS TRANSFERS	223	265	263	8	281	277	8
TOTAL LIRR@NYPS	85,415	102,908	99,327	57,428	109,481	105,751	61,504

Table A-7

AM PEAK PERIOD (6-10AM) DISTRIBUTION OF LIRR ARRIVING PASSENGERS AT GRAND CENTRAL TERMINAL

	2010 NO-BUILD (NB13)	2010 TSM (T310)	2010 LIRR-GCT BUILD (G310)	2020 NO-BUILD (NB23)	2020 TSM (TSM3)	2020 LIRR-GCT BUILD (GCT3)
WALK TO FINAL DESTINATION						
111	0	0	308.77	0	0	321.52
114	0	0	54.42	0	0	57.62
115	0	0	288.12	0	0	302.72
116	0	0	885.31	0	0	924.72
117	0	0	2,593.77	0	0	2,711.88
118	0	0	674.69	0	0	706.82
119	0	0	2,407.41	0	0	2,509.53
120	0	0	3,506.74	0	0	3,651.21
123	0	0	1,802.83	0	0	1,874.74
146	0	0	2,152.37	0	0	2,330.46
147	0	0	320.46	0	0	346.48
148	0	0	1,610.34	0	0	1,727.02
149	0	0	788.94	0	0	845.99
150	0	0	717.71	0	0	774.12
151	0	0	484.58	0	0	519.79
152	0	0	898.87	0	0	956.00
153	0	0	3,337.54	0	0	3,592.10
154	0	0	5,480.30	0	0	5,905.50
155	0	0	4,971.62	0	0	5,150.13
156	0	0	3,561.01	0	0	3,693.86
157	0	0	1,805.31	0	0	1,865.02
158	0	0	3,715.59	0	0	3,867.53
159	0	0	1,623.85	0	0	1,689.91
160	0	0	1,644.42	0	0	1,711.51
161	0	0	1,550.82	0	0	1,611.45
162	0	0	321.07	0	0	333.84
163	0	0	256.22	0	0	265.00
164	0	0	725.36	0	0	751.23
165	0	0	184.45	0	0	193.83
166	0	0	854.91	0	0	884.40
167	0	0	74.06	0	0	76.34
168	0	0	1,179.24	0	0	1,213.07
169	0	0	919.35	0	0	948.73
170	0	0	112.55	0	0	118.92
TOTAL PEDESTRIANS			51,813.00			54,433.00
TRANSFERS TO SUBWAY						
Subway Route 4/5 SB	0	0	4,223	0	0	4,485
Subway Route 6 SB	0	0	810	0	0	842
Subway Route 4/5 NB	0	0	683	0	0	583
Subway Route 6 NB	0	0	1,634	0	0	1,646
Subway Route 7 EB	0	0	4	0	0	4
Subway Route 7 WB	0	0	21	0	0	23
Subway Route S	0	0	-	0	0	-
TOTAL TO SUBWAY	0	0	7,375	0	0	7,583
TRANSFERS TO BUS	0	0	2,556	0	0	3,027
TOTAL LIRR@GCT	0	0	61,745	0	0	65,043

Table A-8
AM PEAK PERIOD (6-10AM) DISTRIBUTION OF LIRR ARRIVING PASSENGERS AT SUNNYSIDE YARD STATION

STATION LOCATION	BASE		YEAR 2010 ALTERNATIVES				YEAR 2020 ALTERNATIVES			
	1995 BASE NETWORK (NB95)	2010 NO-BUILD (NB13)	2010 TSM (T310)	2010 LIRR-GCT BUILD (G310)	2020 NO-BUILD (NB23)	2020 TSM (TSM3)	2020 LIRR-GCT BUILD (GCT3)			
LONG ISLAND RAILROAD TO SUBWAY										
Subway Route 7	0	0	0	169	0	0	169			
Subway Routes F/R	0	0	0	540	0	0	572			
Subway Route E	0	0	0	5	0	0	5			
Subway Route N	0	0	0	29	0	0	32			
Subtotal	0	0	0	743	0	0	779			
WALK TO FINAL DESTINATION ZONE										
Zone 687	0	0	0	212	0	0	234			
Zone 692	0	0	0	171	0	0	180			
Zone 695	0	0	0	0	0	0	0			
Zone 696	0	0	0	293	0	0	380			
Zone 697	0	0	0	440	0	0	459			
Subtotal	0	0	0	1,115	0	0	1,254			
TO BUS										
Total Bus Transfers	0	0	0	212	0	0	223			
Total LIRR @ Sunnyside Yard	0	0	0	2,070	0	0	2,255			

Table A-9

INCREMENTAL TRAVEL TIMES SAVINGS VERSUS NO-BUILD

STATION LOCATION	BASE		YEAR 2010 ALTERNATIVES				YEAR 2020 ALTERNATIVES			
	1995 BASE NETWORK (NB95)		2010 NO-BUILD (NB13)	2010 TSM (T310)	2010 LIRR-GCT BUILD (G310)	2020 NO-BUILD (NB23)	2020 TSM (TSM3)	2020 LIRR-GCT BUILD (GCT3)		
DAILY PERSON HOURS										
TT Savings for Existing Riders	0		0	3,270	25,997	0	3,499	27,653		
Out-of-Vehicle Time	0		0	2,984	(3,812)	0	2,283	(3,642)		
In-Vehicle Time	0		0	6,254	22,185	0	5,782	24,011		
Total										
TT Savings for New Riders	0		0	205	2,369	0	213	2,594		
Out-of-Vehicle Time	0		0	(39)	(249)	0	91	(334)		
In-Vehicle Time	0		0			0				
Total										
TT Savings for ALL	0		0	3,475	28,366	0	3,712	30,247		
Out-of-Vehicle Time	0		0	2,945	(4,061)	0	2,374	(3,976)		
In-Vehicle Time	0		0	6,420	24,305	0	6,086	26,271		
Total										
ANNUAL PERSON HOURS										
Days/Year	282		282	282	282	282	282	282		
TT Savings for Existing Riders	0		0	922,140	7,331,154	0	986,718	7,798,146		
Out-of-Vehicle Time	0		0	841,488	(1,074,984)	0	643,806	(1,027,044)		
In-Vehicle Time	0		0	1,763,628	6,256,170	0	1,630,524	6,771,102		
Total										
TT Savings for New Riders	0		0	57,810	668,058	0	60,066	731,508		
Out-of-Vehicle Time	0		0	(10,998)	(70,218)	0	25,662	(94,188)		
In-Vehicle Time	0		0	46,812	597,840	0	85,728	637,320		
Total										
TT Savings for ALL	0		0	979,950	7,999,212	0	1,046,784	8,529,654		
Out-of-Vehicle Time	0		0	830,490	(1,145,202)	0	669,468	(1,121,232)		
In-Vehicle Time	0		0	1,810,440	6,854,010	0	1,716,252	7,408,422		
Total										

TABLE A-10 YEAR 2010 WEEKDAY AM PEAK 4 HOUR COMMUTER RAIL RIDERSHIP BY BRANCH

Note: For determining Branch-level impacts only. Station-level data should be used with caution.

Node Station	1995 BASE						YEAR 2010 ALTERNATIVES											
	1990 Counts			1995 Counts			1995 BASE NETWORK(NB95)			2010 NO-BUILD (NB13)			2010 TSM (T310)			2010 LIRR-GCT BUILD(G310)		
	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total
CITY TERMINAL ZONE																		
3000 New York-Penn Station	84,811	3,269	88,080	86,630	3,269	89,899	85,415	3,772	89,187	102,908	4,109	107,017	99,327	4,385	103,712	57,428	4,693	62,121
3807 New York-GCT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	61,744	1,096	62,840
3002 Hunterspoint Ave	3,457	0	3,457	2,890	0	2,890	3,263	0	3,263	3,287	31	3,318	6,989	28	7,017	541	28	570
3001 Long Island City	195	0	195	240	0	240	140	3	143	44	0	44	131	0	131	40	0	40
3091 Flatbush Ave	11,935	475	12,410	10,291	475	10,766	10,499	598	11,097	11,292	463	11,755	12,194	455	12,650	9,833	468	10,301
Subtotal	100,398	3,744	104,142	100,051	3,744	103,795	99,318	4,373	103,691	117,530	4,604	122,134	118,642	4,868	123,509	129,587	6,285	135,872
3806 Jamaica Penn Station	3,582	2,308	5,890	3,538	2,292	5,830	3,131	964	4,095	3,909	1,078	4,987	3,888	1,082	4,970	4,203	1,448	5,652
3003 Woodside	659	495	1,154	802	521	1,323	1,077	250	1,327	1,913	210	2,124	1,646	202	1,848	859	190	1,049
3808 Sunnyside	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,010	67	2,077
3004 Forest Hills	62	352	414	58	433	491	272	41	313	382	48	429	414	54	468	357	65	421
3005 Kew Gardens	30	447	477	39	467	506	206	89	295	320	32	353	323	38	360	338	38	376
3092 Nostrand Ave	156	14	170	105	14	119	175	49	224	193	34	228	195	35	231	188	34	221
3093 East New York	4,489	3,616	8,105	4,659	3,728	8,387	5,134	1,457	6,591	7,022	1,471	8,492	6,777	1,480	8,257	8,254	1,938	10,192
Subtotal	104,887	7,360	112,247	104,710	7,472	112,182	104,452	5,830	110,282	124,552	6,074	130,626	125,419	6,348	131,767	137,841	8,223	146,064
BABYLON BRANCH																		
3049 Babylon	230	3,325	3,555	195	3,265	3,460	101	2,800	2,901	137	3,603	3,740	146	3,965	4,111	128	3,031	3,159
3048 Lindenhurst	97	1,526	1,623	91	1,278	1,369	56	1,230	1,286	64	1,940	2,004	66	1,721	1,787	67	2,823	2,890
3047 Copiague	150	1,015	1,165	145	1,001	1,146	48	1,186	1,235	62	1,681	1,742	64	1,684	1,748	66	1,820	1,887
3046 Amityville	162	831	993	210	727	937	180	1,005	1,185	211	1,418	1,629	214	1,422	1,636	216	1,547	1,763
3045 Massapequa Park	52	1,666	1,718	50	1,481	1,531	32	1,817	1,849	40	2,162	2,202	41	2,167	2,207	41	2,461	2,502
3044 Massapequa	91	2,708	2,799	90	2,522	2,612	60	2,181	2,240	73	2,594	2,667	75	2,602	2,677	84	2,519	2,603
3043 Sealord	63	1,566	1,629	58	1,435	1,493	53	1,773	1,825	63	2,043	2,111	64	2,053	2,116	65	1,996	2,060
3042 Wantagh	64	2,788	2,852	53	2,739	2,792	49	2,233	2,282	58	2,583	2,641	59	2,571	2,630	58	2,472	2,530
3041 Bellmore	75	2,800	2,875	92	2,698	2,790	65	2,295	2,360	76	2,744	2,820	73	2,749	2,821	79	2,887	2,965
3040 Merrick	55	2,827	2,882	70	2,812	2,882	126	2,535	2,661	141	2,993	3,139	143	3,000	3,143	143	3,233	3,376
3039 Freeport	195	1,642	1,837	200	1,672	1,872	121	2,087	2,208	137	2,447	2,583	134	2,454	2,587	146	2,573	2,719
3038 Baldwin	97	3,014	3,111	114	2,914	3,028	73	3,125	3,198	86	3,653	3,739	86	3,660	3,747	93	4,293	4,386
3037 Rockville Centre	207	2,414	2,621	215	2,191	2,406	275	1,895	2,170	298	1,984	2,282	303	1,984	2,287	307	2,089	2,397
Subtotal	1,538	28,122	29,660	1,583	26,735	28,318	1,238	26,162	27,400	1,445	31,854	33,299	1,466	32,030	33,496	1,492	33,745	35,237

TABLE A-10 YEAR 2010 WEEKDAY AM PEAK 4 HOUR COMMUTER RAIL RIDERSHIP BY BRANCH

Note: For determining Branch-level impacts only. Station-level data should be used with caution.

Node Station	1995 BASE						YEAR 2010 ALTERNATIVES											
	1995 Base Network (NB95)			1995 Counts			2010 NO-BUILD (NB13)			2010 TSM (T310)			2010 LIRR-GCT BUILD (G310)					
	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total
FAR ROCKAWAY BRANCH																		
3127 Far Rockaway	16	113	129	22	58	80	5	70	75	16	418	434	16	420	436	16	423	439
3126 Inwood	9	225	234	9	232	241	30	466	496	56	444	501	56	445	501	56	465	522
3125 Lawrence	17	253	270	17	263	280	4	519	524	9	540	548	9	541	550	9	577	586
3124 Cedarhurst	80	556	636	78	519	597	45	335	380	59	353	412	58	353	411	58	363	421
3123 Woodmere	48	597	645	56	630	686	30	617	647	41	686	727	41	685	726	40	692	732
3122 Hewlett	85	704	789	78	642	720	6	885	891	8	988	996	8	990	998	8	997	1,005
3121 Gibson	40	637	677	33	501	534	37	49	86	47	50	97	47	50	97	47	50	97
3097 Valley Stream	151	2,156	2,307	137	2,254	2,391	211	2,241	2,452	196	2,505	2,701	200	2,511	2,711	209	2,639	2,848
3096 Rosedale	21	1,276	1,297	21	1,058	1,079	155	741	896	211	946	1,157	217	949	1,166	222	1,091	1,313
3095 Laurelton	19	489	508	24	471	495	15	700	715	27	710	737	28	710	738	28	805	833
3094 Locust Manor	28	492	520	24	452	476	41	427	469	36	275	311	36	275	312	36	266	303
Total	514	7,498	8,012	499	7,080	7,579	578	7,052	7,630	705	7,915	8,620	716	7,929	8,645	730	8,367	9,097
HEMPSTEAD BRANCH																		
3120 Hempstead	235	1,029	1,264	264	800	1,064	62	973	1,034	53	1,041	1,094	84	1,042	1,125	78	1,170	1,248
3119 Country Life Press	11	347	358	11	298	309	4	335	340	2	360	363	3	361	364	3	403	405
3118 Garden City	118	577	695	115	581	696	65	242	307	66	294	360	91	294	385	73	312	386
3117 Nassau Blvd	76	655	731	73	677	750	68	394	462	77	438	514	85	438	523	82	750	831
3116 Stewart Manor	15	834	849	18	771	789	44	1,031	1,076	36	1,089	1,125	68	1,090	1,158	69	1,640	1,708
3115 Floral Park	60	1,270	1,330	63	1,231	1,294	71	1,262	1,333	63	1,204	1,267	88	1,203	1,291	59	647	706
3114 Bellerose	10	444	454	8	516	524	92	726	818	96	532	628	116	599	716	106	693	799
3008 Queens Village	32	579	611	33	474	507	24	640	664	25	688	713	38	696	735	34	1,068	1,102
3007 Hollis	6	56	62	7	53	60	17	78	95	21	69	90	39	69	108	27	156	184
Total	563	5,791	6,354	592	5,401	5,993	448	5,682	6,129	439	5,714	6,154	612	5,792	6,405	531	6,838	7,369

TABLE A-10 YEAR 2010 WEEKDAY AM PEAK 4 HOUR COMMUTER RAIL RIDERSHIP BY BRANCH

Note: For determining Branch-level impacts only, Station-level data should be used with caution.

Node Station	1995 BASE						YEAR 2010 ALTERNATIVES											
	1990 Counts			1995 Counts			1995 BASE NETWORK(NB95)			2010 NO-BUILD (NB13)			2010 TSM (T310)			2010 LIRR-CCT BUILD(G310)		
	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total
LONG BEACH BRANCH																		
3113 Long Beach	116	1,763	1,879	116	1,631	1,747	24	1,860	1,884	26	2,321	2,347	26	2,101	2,128	26	2,181	2,207
3112 Island Park	30	1,175	1,205	30	1,146	1,176	27	1,550	1,576	33	1,592	1,625	33	1,814	1,847	33	1,865	1,899
3111 Oceanside	47	1,361	1,408	70	1,264	1,334	38	793	832	47	671	718	48	1,255	1,303	49	1,155	1,204
3110 East Rockaway	37	431	468	62	474	536	7	926	933	8	1,397	1,404	8	816	823	8	962	970
3109 Centre Ave	23	518	541	13	489	502	20	250	269	24	299	324	25	299	324	25	310	335
3036 Lynbrook	202	1,568	1,770	198	1,473	1,671	116	1,445	1,562	120	1,460	1,580	122	1,462	1,585	123	1,562	1,685
Total	455	6,816	7,271	489	6,477	6,966	233	6,823	7,056	259	7,740	7,999	263	7,747	8,010	264	8,035	8,299
MONTAUK BRANCH																		
3068 Montauk	11	4	15	11	5	16	1	0	1	3	0	3	3	0	3	3	0	3
3067 Amagansett	3	6	9	4	3	7	0	94	94	0	130	131	0	131	131	0	131	131
3066 East Hampton	25	2	27	25	16	41	7	35	42	15	46	61	15	47	62	14	47	61
3065 Bridgehampton	8	3	11	9	10	19	8	6	14	11	9	20	11	9	20	12	9	21
3064 Southampton	14	8	22	14	7	21	11	25	37	14	34	48	14	34	49	14	35	48
3063 Southampton Campus-L	3	0	3	3	0	3	11	0	12	14	0	15	14	0	15	14	0	14
3062 Hampton Bays	10	7	17	10	15	25	6	12	17	7	17	24	7	17	24	7	17	24
3061 Quogue	3	0	3	3	0	3	0	3	3	0	3	3	0	3	3	0	3	3
3060 Westhampton	10	1	11	11	8	19	9	16	26	13	22	35	13	22	35	13	22	35
3059 Speonk	7	41	48	8	66	74	2	35	37	2	78	79	2	75	76	2	79	81
3058 Center Moriches	0	19	19	1	11	12	2	21	22	3	10	13	3	14	17	3	9	12
3057 Mastic-Shirley	12	313	325	14	244	258	8	250	258	11	434	445	11	441	453	11	447	458
3056 Bellport	4	9	13	1	10	11	2	18	20	5	16	20	5	9	14	4	9	14
3055 Patchogue	66	657	723	72	489	541	40	416	456	54	660	714	54	677	731	54	674	728
3054 Sayville	62	425	487	90	559	649	20	548	568	27	976	1,004	28	927	955	27	1,025	1,052
3053 Oakdale	11	186	197	13	158	171	12	220	232	18	319	336	18	235	253	18	228	246
3052 Great River	1	71	72	0	79	79	18	79	96	21	88	109	26	288	314	20	150	170
3051 Islip	23	416	439	18	353	371	30	352	382	48	557	605	57	608	665	47	560	608
3050 Bay Shore	60	491	551	65	450	515	27	601	628	33	947	980	38	1,039	1,077	33	965	998
Total	333	2,659	2,992	372	2,463	2,835	214	2,730	2,944	298	4,347	4,645	320	4,575	4,895	295	4,411	4,706

TABLE A-10 YEAR 2010 WEEKDAY AM PEAK 4 HOUR COMMUTER RAIL RIDERSHIP BY BRANCH

Note: For determining Branch-level impacts only, Station-level data should be used with caution.

Node	Station	AM Peak 4 Hours Counts						1995 Counts						1995 BASE			2010 NC-BUILD (NB13)			2010 TSM (T310)			2010 LIRR-GCT BUILD(G310)		
		1990 Counts			1995 Counts			1995 Counts			1995 BASE NETWORK(NB95)			2010 NC-BUILD (NB13)			2010 TSM (T310)			2010 LIRR-GCT BUILD(G310)					
		Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total			
OYSTER BAY	3108	Oyster Bay	22	51	73	22	57	79	20	8	29	20	9	30	21	12	33	21	9	30					
	3107	Mill Neck	1	2	3	1	2	3	2	139	141	2	196	198	3	214	217	3	202	204					
	3106	Locust Valley	30	186	216	28	180	208	21	202	223	22	272	294	25	296	320	23	281	304					
	3105	Glen Cove	7	146	153	11	147	158	27	74	101	27	102	129	30	109	139	28	104	132					
	3104	Glen St	10	153	163	18	149	167	1	244	245	1	332	333	1	369	371	1	340	342					
	3103	Sea Cliff	13	199	212	11	188	199	52	182	234	47	245	292	65	277	341	51	251	302					
	3102	Glen Head	9	196	205	13	264	277	5	252	257	6	350	356	6	418	424	6	356	362					
	3101	Greenvale	14	93	107	12	82	94	9	165	173	7	238	245	10	258	268	7	242	249					
	3100	Roslyn	51	205	256	52	234	286	36	244	279	27	313	340	30	364	394	29	334	362					
	3099	Albertson	29	167	196	32	170	202	45	191	236	30	246	276	33	307	340	30	261	291					
	3098	East Williston	21	492	513	16	459	475	11	489	500	5	676	681	7	768	775	5	585	590					
		Total	207	1,890	2,097	216	1,932	2,148	230	2,189	2,419	195	2,979	3,175	231	3,391	3,622	204	2,964	3,168					
	PORT JEFFERSON	3078	Port Jefferson	62	434	496	62	358	420	11	454	465	15	847	862	15	916	931	15	875	890				
		3077	Stony Brook	110	336	446	110	332	442	63	583	646	73	523	596	73	565	639	74	497	570				
3076		St James	18	201	219	20	214	234	22	209	231	25	242	267	25	267	292	25	244	269					
3075		Smithtown	39	485	524	42	490	532	53	575	628	61	783	844	62	831	892	61	786	848					
3074		Kings Park	26	893	919	19	861	880	31	875	906	38	1,196	1,234	39	1,284	1,323	38	1,199	1,238					
3073		Northport	65	1,133	1,198	75	1,041	1,116	50	1,125	1,175	62	1,222	1,284	63	1,316	1,379	62	1,214	1,276					
3072		Greenlawn	13	388	401	10	424	434	39	590	630	48	29	77	49	80	130	51	22	73					
3071		Huntington	394	4,485	4,879	273	4,664	4,937	109	3,910	4,019	122	7,177	7,299	127	7,738	7,865	122	6,789	6,911					
3070		Cold Spring Harbor	36	1,010	1,046	37	1,036	1,073	20	780	800	24	885	908	24	695	720	24	1,178	1,202					
3069		Syosset	217	2,009	2,226	206	2,352	2,558	173	2,533	2,707	203	3,093	3,297	210	3,080	3,290	205	3,452	3,657					
3014		Hicksville	665	6,285	6,950	604	6,336	6,940	462	6,220	6,682	609	8,038	8,647	633	8,065	8,697	641	7,544	8,185					
3013		Westbury	227	1,359	1,586	244	1,510	1,754	179	1,559	1,738	202	1,412	1,614	217	1,405	1,622	225	2,182	2,407					
3012		Carle Place	29	297	326	33	296	329	477	211	688	504	248	752	541	248	789	476	20	496					
3011		Mineola	810	2,509	3,319	641	2,287	2,928	376	1,852	2,227	399	2,354	2,753	410	2,387	2,797	463	2,197	2,660					
3010	Merrillon Ave	14	547	561	20	593	613	184	1,486	1,670	223	1,737	1,961	234	1,726	1,960	232	2,118	2,350						
3009	New Hyde Park	65	1,152	1,217	81	1,187	1,268	193	1,770	1,963	187	2,287	2,474	190	2,289	2,479	198	3,019	3,217						
	Total	2,790	23,523	26,313	2,477	23,981	26,458	2,443	24,732	27,176	2,794	32,073	34,868	2,911	32,893	35,804	2,914	33,334	36,248						

TABLE A-10 YEAR 2010 WEEKDAY AM PEAK 4 HOUR COMMUTER RAIL RIDERSHIP BY BRANCH

Note: For determining Branch-level impacts only. Station-level data should be used with caution.

Node Station	1990 Counts						1995 Counts						1995 BASE			2010 NO-BUILD (NB13)			YEAR 2010 ALTERNATIVES			2010 LIRR-GCT BUILD(G310)		
	AM Peak 4 Hours Counts			1995 Counts			1995 BASE NETWORK(NB95)			2010 NO-BUILD (NB13)			2010 TSM (T310)			2010 LIRR-GCT BUILD(G310)								
	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total						
PORT WASHINGTON																								
3090 Port Washington	206	2,467	2,673	206	2,429	2,635	152	2,332	2,483	145	2,769	2,914	182	2,771	2,953	146	2,831	2,977						
3089 Plandome	31	478	509	28	468	496	23	227	250	27	263	290	33	266	299	27	269	296						
3088 Manhasset	183	2,159	2,342	172	2,197	2,369	293	2,410	2,702	305	3,335	3,640	389	2,816	3,205	311	2,643	2,954						
3087 Great Neck	455	2,694	3,149	419	3,015	3,434	484	3,031	3,515	404	3,195	3,599	582	3,720	4,302	417	4,510	4,928						
3086 Little Neck	17	1,464	1,481	19	1,446	1,465	166	1,269	1,435	144	849	992	178	919	1,097	146	1,011	1,156						
3085 Douglaston	30	1,014	1,044	30	1,140	1,170	24	1,479	1,502	27	1,767	1,794	40	1,768	1,808	28	1,943	1,972						
3084 Bayside	84	3,073	3,157	87	3,263	3,350	119	3,695	3,814	123	2,080	2,204	136	2,135	2,271	136	2,439	2,576						
3083 Auburndale	16	1,094	1,110	12	1,132	1,144	17	1,472	1,489	14	1,327	1,341	16	1,361	1,376	17	2,662	2,679						
3082 Broadway	17	927	944	15	1,019	1,034	71	1,078	1,149	69	718	787	83	737	820	75	1,275	1,350						
3081 Murray Hill	12	370	382	14	447	461	80	150	229	97	62	159	103	67	171	101	122	223						
3080 Flushing	89	427	516	106	482	588	515	710	1,224	700	763	1,463	727	798	1,525	726	1,577	2,303						
Total	1,140	16,167	17,307	1,108	17,038	18,146	1,944	17,849	19,794	2,054	17,128	19,182	2,469	17,358	19,827	2,131	21,283	23,414						
RONKONKOMA																								
3029 Greenport	8	7	15	8	3	11	15	19	34	18	22	40	18	22	41	18	22	41						
3028 Southold	0	8	8	0	9	9	16	96	112	20	128	148	20	128	148	20	130	150						
3027 Mattituck	2	6	8	2	8	10	19	27	46	23	16	39	24	16	40	23	16	39						
3026 Riverhead	16	16	32	16	7	23	2	50	51	2	98	100	2	98	100	2	98	100						
3025 Yaphank	0	14	14	0	5	5	14	6	20	18	10	28	18	10	28	18	10	28						
3024 Medford	0	27	27	0	15	15	15	3	18	22	3	25	22	3	25	22	3	25						
3023 Holtsville	1	11	12	1	4	5	46	152	198	58	242	300	59	254	313	58	252	310						
3022 Ronkonkoma	251	5,003	5,254	251	5,430	5,681	59	5,029	5,088	73	6,881	6,953	74	6,915	6,989	73	6,791	6,864						
3021 Central Islip	52	1,187	1,239	56	1,514	1,570	119	1,081	1,200	147	1,259	1,407	148	1,266	1,414	153	1,827	1,980						
3020 Brentwood	95	1,152	1,247	83	1,155	1,238	98	1,546	1,644	102	3,042	3,143	104	3,007	3,111	123	1,938	2,061						
3019 Deer Park	87	1,502	1,589	101	1,815	1,916	131	1,590	1,720	160	1,310	1,471	162	1,259	1,421	172	3,661	3,833						
3018 Wyandanch	87	1,323	1,410	101	1,375	1,476	63	1,339	1,402	75	1,898	1,972	77	1,880	1,956	97	1,585	1,681						
3017 Pine Lawn	0	0	0	0	0	0	31	0	31	17	0	17	17	0	17	28	0	28						
3016 Farmingdale	114	881	995	111	987	1,098	277	1,157	1,435	300	1,415	1,715	307	1,417	1,723	315	1,502	1,817						
3015 Bethpage	62	1,171	1,233	41	1,093	1,134	208	864	1,071	264	1,067	1,330	267	1,120	1,387	295	1,582	1,877						
Total	775	12,308	13,083	771	13,420	14,191	1,112	12,957	14,069	1,299	17,389	18,688	1,318	17,395	18,713	1,417	19,416	20,834						

TABLE A-10 YEAR 2010 WEEKDAY AM PEAK 4 HOUR COMMUTER RAIL RIDERSHIP BY BRANCH

Note: For determining Branch-level impacts only. Station-level data should be used with caution.

Node Station	AM Peak 4 Hours Counts						1995 BASE			YEAR 2010 ALTERNATIVES											
	1990 Counts			1995 Counts			1995 BASE NETWORK(NB55)			2010 NO-BUILD (NB13)				2010 TSM (T310)				2010 LIRR-GCT BUILD(G310)			
	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total
WEST HEMPSTEAD																					
3132 West Hempstead	6	189	195	6	226	232	13	209	223	18	198	216	13	198	211	18	224	242			
3131 Hempstead Gardens	5	204	209	4	139	143	81	193	274	72	201	274	73	201	275	67	239	306			
3130 Lakeview	4	297	301	4	302	306	5	267	273	6	288	294	6	289	296	6	316	322			
3129 Malverne	11	565	576	10	524	534	8	523	531	8	561	569	9	582	590	9	658	667			
3128 Westwood	3	347	350	2	345	347	21	438	459	22	450	472	22	452	474	22	507	529			
3035 St Albans	0	40	40	0	39	39	20	79	99	27	46	73	28	46	73	33	218	251			
Total	29	1,642	1,671	26	1,575	1,601	150	1,709	1,859	154	1,765	1,919	151	1,768	1,919	156	2,162	2,318			
LIRR TOTALS																					
LIRR Total W/O Terminal Zone	8,344	106,416	114,760	8,133	106,102	114,235	8,591	107,886	116,476	9,643	128,905	138,549	10,456	130,880	141,336	10,134	140,556	150,690			
LIRR Total With Terminal Zone	113,231	113,776	227,007	112,843	113,574	226,417	113,043	113,715	226,758	134,195	134,979	269,175	135,875	137,228	273,103	147,975	148,780	296,754			

TABLE A-10 YEAR 2010 WEEKDAY AM PEAK 4 HOUR COMMUTER RAIL RIDERSHIP BY BRANCH

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Node Station	AM Peak 4 Hours Counts						1995 BASE						YEAR 2010 ALTERNATIVES					
	1990 Counts			1995 Counts			1995 BASE NETWORK(NB95)			2010 NO-BUILD (NB13)			2010 TSM (T310)			2010 LIRR-GCT BUILD(G310)		
	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total
METRO NORTH																		
HUDSON LINE																		
3227 Poughkeepsie	0	661	661	0	661	661	127	784	911	216	890	1,106	216	890	1,106	217	890	1,107
3226 New Hamburg	0	619	619	0	619	619	12	787	799	23	878	901	23	878	901	23	880	902
3225 Beacon	5	921	926	5	921	926	44	872	916	89	1,143	1,232	89	1,143	1,232	89	1,141	1,230
3224 Cold Spring	2	307	309	2	307	309	7	374	381	8	434	442	8	434	442	8	434	442
3223 Garrison	0	203	203	0	203	203	2	251	253	2	299	301	2	299	301	2	299	301
3222 Peekskill	35	888	923	35	888	923	81	926	1,007	113	1,521	1,634	113	1,521	1,634	113	1,519	1,632
3221 Montrose	1	223	224	1	223	224	40	140	179	0	0	0	0	0	0	0	0	0
3220 Crogers	23	118	141	23	118	141	36	139	175	0	0	0	0	0	0	0	0	0
3219 Croton-Harmon	368	2,935	3,303	368	2,935	3,303	90	3,093	3,093	92	2,789	2,881	92	2,789	2,881	92	2,787	2,879
3218 Ossining	15	816	831	15	816	831	231	794	1,024	257	885	1,142	257	885	1,143	257	885	1,143
3217 Scarborough	1	716	717	1	716	717	43	912	955	46	1,087	1,132	46	1,087	1,132	46	1,087	1,133
3216 Philipse Manor	1	311	312	1	311	312	72	153	225	82	178	260	82	178	259	83	178	261
3215 Tarrytown	65	1,652	1,717	65	1,652	1,717	127	1,801	1,928	101	1,099	1,201	102	1,101	1,203	102	1,100	1,202
3214 Irvington	32	602	634	32	602	634	23	729	751	23	855	878	23	855	878	23	855	878
3213 Ardsley	13	142	155	13	142	155	0	436	436	0	31	31	0	31	31	0	31	31
3212 Dobbs Ferry	20	870	890	20	870	890	132	711	842	130	842	972	130	841	972	131	842	972
3211 Hastings	15	869	884	15	869	884	171	819	990	173	950	1,123	173	949	1,122	174	950	1,123
3210 Greystone	0	518	518	0	518	518	66	622	687	63	169	232	63	169	232	63	169	232
3209 Glenwood	1	249	250	1	249	250	40	291	330	37	682	720	37	682	720	38	682	720
3208 Yonkers	68	440	508	68	440	508	218	805	1,023	202	531	734	202	531	734	203	531	734
3207 Ludlow	3	190	193	3	190	193	75	533	608	74	431	505	74	431	505	74	431	506
3206 Riverdale	5	480	485	5	480	485	51	776	827	45	563	608	46	563	609	48	563	611
3205 Spuyten Duyvil	6	628	634	6	628	634	37	397	433	38	415	452	38	414	452	40	415	455
3204 Marble Hill	134	56	190	134	56	190	1,343	698	2,041	984	704	1,688	984	704	1,688	1,000	706	1,706
3203 University Heights	15	10	25	15	10	25	91	65	155	75	110	184	75	110	184	80	110	190
3202 Morris Heights	14	66	80	14	66	80	28	44	72	15	97	112	15	97	112	16	97	114
Total	842	15,490	16,332	842	15,490	16,332	3,184	17,859	21,043	2,888	17,583	20,470	2,888	17,583	20,471	2,920	17,581	20,501

TABLE A-10 YEAR 2010 WEEKDAY AM PEAK 4 HOUR COMMUTER RAIL RIDERSHIP BY BRANCH

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Node Station	AM Peak 4 Hours Counts						1995 BASE			YEAR 2010 ALTERNATIVES					
	1990 Counts			1995 Counts			1995 BASE NETWORK(NB55)			2010 NO-BUILD (NB13)			2010 TSM (T310)		
	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total
HARLEM LINE															
3259 Dover Plains	0	50	50	0	50	50	1	115	116	1	198	199	1	198	199
3258 Harlem Valley-Wingda	1	18	19	1	18	19	1	74	75	2	173	175	2	173	175
3257 Pawling	0	78	78	0	78	78	10	175	185	48	349	396	48	348	396
3256 Patterson	1	45	46	1	45	46	8	10	18	11	23	33	11	23	33
3255 Brewster North	27	568	595	27	568	595	2	598	600	3	835	838	3	835	838
3254 Brewster	1	774	775	1	774	775	69	354	423	94	493	587	94	493	587
3253 Croton Falls	9	322	331	9	322	331	3	715	718	9	943	952	9	943	952
3252 Purdy's	1	280	281	1	280	281	47	295	342	62	404	466	62	404	466
3251 Golden's Bridge	4	754	758	4	754	758	1	984	985	1	1,214	1,215	1	1,214	1,215
3250 Katonah	11	791	802	11	791	802	8	457	465	9	509	518	9	509	518
3249 Bedford Hills	10	496	506	10	496	506	112	528	640	139	589	729	140	589	730
3248 Mount Kisco	33	900	933	33	900	933	183	833	1,016	210	932	1,142	210	931	1,142
3247 Chappaqua	13	1,645	1,658	13	1,645	1,658	9	1,334	1,344	11	2,125	2,136	11	2,125	2,136
3246 Pleasantville	18	522	540	18	522	540	88	660	767	90	854	944	90	854	944
3245 Hawthorne	11	404	415	11	404	415	116	257	372	116	319	435	116	319	435
3244 Valhalla	5	185	190	5	185	190	63	208	271	70	254	324	70	254	324
3243 North White Plains	15	1,429	1,444	15	1,429	1,444	51	1,215	1,267	47	1,497	1,544	47	1,496	1,544
3242 White Plains	162	2,552	2,714	162	2,552	2,714	1,080	2,842	3,923	1,305	3,660	4,965	1,305	3,660	4,974
3241 Hartsdale	9	2,246	2,255	9	2,246	2,255	31	2,684	2,715	53	1,985	2,038	53	1,985	2,038
3240 Scarsdale	22	3,019	3,041	22	3,019	3,041	144	2,537	2,681	173	5,170	5,343	174	5,170	5,344
3239 Crestwood	3	1,363	1,366	3	1,363	1,366	85	2,059	2,145	111	2,678	2,788	111	2,678	2,788
3238 Tuckahoe	7	1,007	1,014	7	1,007	1,014	15	1,473	1,488	26	2,094	2,120	26	2,094	2,123
3237 Bronxville	17	2,011	2,028	17	2,011	2,028	97	1,863	1,980	121	2,574	2,696	122	2,573	2,695
3236 Fleetwood	5	1,880	1,885	5	1,880	1,885	45	1,587	1,631	58	2,375	2,433	58	2,374	2,432
3235 Mount Vernon West	115	833	948	115	833	948	167	1,006	1,173	184	390	574	185	390	574
3234 Wakefield	1	218	219	1	218	219	42	395	437	67	531	598	67	531	599
3233 Woodlawn	15	633	648	15	633	648	57	1,342	1,399	89	1,447	1,536	89	1,446	1,537
3232 Williams Bridge	26	92	118	26	92	118	147	593	740	253	907	1,161	253	907	1,168
3231 Botanical Garden	118	241	359	118	241	359	73	184	257	105	464	570	105	465	573
3230 Fordham	147	122	269	147	122	269	512	310	822	663	653	1,316	663	652	1,315
3229 Tremont	5	1	6	5	1	6	41	139	181	240	257	497	240	257	497
3228 Melrose	5	4	9	5	4	9	317	206	524	743	407	1,150	743	407	1,150
Total	817	25,483	26,300	817	25,483	26,300	3,629	28,071	31,700	5,114	37,303	42,417	5,115	37,300	42,415

TABLE A-10 YEAR 2010 WEEKDAY AM PEAK 4 HOUR COMMUTER RAIL RIDERSHIP BY BRANCH

Note: For determining Branch-level impacts only. Station-level data should be used with caution.

Node Station	1990 Counts			AM Peak 4 Hours Counts			1995 Counts			1995 BASE			YEAR 2010 ALTERNATIVES						2010 LIRR-GCT BUILD(G310)		
	1990 Counts			AM Peak 4 Hours Counts			1995 Counts			1995 BASE NETWORK(NB95)			2010 NO-BUILD (NB13)			2010 TSM (T310)			2010 LIRR-GCT BUILD(G310)		
	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total
NEW HAVEN LINE																					
3297 Danbury	0	95	95	0	95	95	0	95	95	184	53	237	209	47	256	209	47	256	209	47	256
3296 Bethel	0	112	112	0	112	112	0	112	112	61	415	477	58	454	511	58	454	511	58	454	511
3295 Redding	1	60	61	1	60	61	1	60	61	2	238	240	2	286	288	2	286	288	2	286	288
3294 Branchville	5	175	180	5	175	180	5	175	180	11	99	110	10	112	122	10	112	122	10	112	122
3293 Cannondale	0	105	105	0	105	105	0	105	105	21	433	454	25	504	528	25	504	528	25	504	528
3291 Wilton (Kent Rd)	23	220	243	23	220	243	23	220	243	17	6	23	0	0	0	0	0	0	0	0	0
3290 Merritt 7	12	108	120	12	108	120	12	108	120	125	134	259	145	158	303	145	158	303	145	158	303
3289 New Canaan	0	984	984	0	984	984	0	984	984	44	944	988	71	839	910	71	839	910	71	839	910
3288 Talmadge Hill	1	334	335	1	334	335	1	334	335	7	782	789	12	1,394	1,406	12	1,394	1,406	12	1,394	1,406
3287 Springdale	0	318	318	0	318	318	0	318	318	59	194	253	94	264	358	94	264	358	94	264	358
3286 Glenbrook	1	348	349	1	348	349	1	348	349	114	543	657	179	762	941	179	762	941	179	762	942
3285 NewHaven	0	990	990	0	990	990	0	990	990	31	1,439	1,470	44	1,974	2,018	44	1,974	2,018	44	1,974	2,018
3284 Milford	17	618	635	17	618	635	17	618	635	5	17	23	6	19	24	6	19	24	6	19	24
3283 Stratford	11	546	557	11	546	557	11	546	557	232	522	755	256	697	953	256	697	953	256	697	953
3282 Bridgeport	121	388	509	121	388	509	121	388	509	530	607	1,137	585	1,145	1,730	585	1,145	1,730	585	1,145	1,730
3281 Fairfield	87	1,989	2,076	87	1,989	2,076	87	1,989	2,076	68	1,776	1,844	84	2,819	2,903	84	2,818	2,903	84	2,818	2,903
3280 Southport	9	151	160	9	151	160	9	151	160	88	310	398	103	3	106	103	3	106	103	3	106
3279 Green's Farms	13	551	564	13	551	564	13	551	564	10	602	612	12	742	754	12	742	754	12	742	754
3278 Westport	90	1,822	1,912	90	1,822	1,912	90	1,822	1,912	141	1,771	1,912	195	2,269	2,465	195	2,269	2,465	195	2,269	2,465
3277 East Norwalk	47	486	533	47	486	533	47	486	533	135	598	733	211	798	1,009	211	798	1,009	211	798	1,009
3276 South Norwalk	182	763	945	182	763	945	182	763	945	184	742	925	261	1,018	1,279	261	1,018	1,279	261	1,018	1,279
3275 Rowayton	5	525	530	5	525	530	5	525	530	29	65	94	32	89	121	32	89	121	32	89	121
3274 Darien	27	1,169	1,196	27	1,169	1,196	27	1,169	1,196	35	1,643	1,677	46	2,274	2,320	46	2,274	2,320	46	2,274	2,320
3273 Noroton Heights	2	965	967	2	965	967	2	965	967	148	940	1,088	175	1,315	1,491	175	1,315	1,491	175	1,315	1,491
3272 Stamford	976	2,572	3,548	976	2,572	3,548	976	2,572	3,548	2,212	2,658	4,869	3,661	3,347	7,007	3,661	3,347	7,007	3,662	3,347	7,008
3271 Old Greenwich	12	830	842	12	830	842	12	830	842	219	629	848	300	843	1,148	300	848	1,148	300	848	1,148
3270 Riverside	5	528	533	5	528	533	5	528	533	38	492	530	52	637	689	52	637	689	52	637	689
3269 Cos Cob	29	707	736	29	707	736	29	707	736	18	1,257	1,275	23	1,558	1,581	23	1,558	1,581	23	1,557	1,581
3268 Greenwich	214	1,838	2,052	214	1,838	2,052	214	1,838	2,052	403	896	1,299	682	1,096	1,758	682	1,096	1,758	682	1,096	1,758
3267 Port Chester	54	1,065	1,119	54	1,065	1,119	54	1,065	1,119	129	1,908	2,037	243	2,346	2,589	243	2,346	2,589	247	2,346	2,592
3266 Rye	26	1,643	1,669	26	1,643	1,669	26	1,643	1,669	132	1,713	1,845	162	2,048	2,211	162	2,048	2,211	163	2,048	2,211
3265 Harrison	30	1,409	1,439	30	1,409	1,439	30	1,409	1,439	55	1,597	1,642	78	1,853	1,931	78	1,853	1,931	78	1,853	1,932
3264 Mamaroneck	36	1,329	1,365	36	1,329	1,365	36	1,329	1,365	86	969	1,055	118	1,051	1,169	118	1,051	1,169	119	1,051	1,170
3263 Larchmont	28	2,641	2,669	28	2,641	2,669	28	2,641	2,669	81	2,291	2,372	102	2,567	2,669	102	2,567	2,669	102	2,567	2,669
3262 New Rochelle	86	1,653	1,739	86	1,653	1,739	86	1,653	1,739	171	1,968	2,139	214	2,052	2,266	214	2,052	2,266	215	2,052	2,266
3261 Pelham	14	1,769	1,783	14	1,769	1,783	14	1,769	1,783	65	1,761	1,826	75	1,929	2,004	75	1,929	2,004	76	1,929	2,004
3260 Mount Vernon	80	901	981	80	901	981	80	901	981	101	1,418	1,519	112	1,459	1,571	112	1,459	1,571	113	1,459	1,571
3505 Fordham	232	2	234	232	2	234	232	2	234	209	249	458	410	296	706	410	296	707	416	297	713
Total	2,476	32,709	35,185	2,476	32,709	35,185	2,476	32,709	35,185	6,199	34,668	40,867	9,028	43,068	52,097	9,028	43,068	52,096	9,043	43,067	52,110

TABLE A-10 YEAR 2010 WEEKDAY AM PEAK 4 HOUR COMMUTER RAIL RIDERSHIP BY BRANCH

Note: For determining Branch-level impacts only. Station-level data should be used with caution.

Node Station	1995 BASE						YEAR 2010 ALTERNATIVES											
	1990 Counts			1995 Counts			1995 BASE NETWORK(NB95)			2010 NO-BUILD (NB13)			2010 TSM (T310)			2010 LIRR-GCT BUILD(G310)		
	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total
MANHATTAN																		
3500 125th St	864	0	864	864	0	864	2,454	774	3,228	2,724	883	3,606	2,725	815	3,540	2,724	779	3,503
3201 125th St			0			0	250	151	401	200	86	287	200	155	356	200	193	394
3200 NYC-Grand Central	66,455	0	66,455	66,455	0	66,455	68,014	2,340	70,354	82,423	3,083	85,506	82,419	3,084	85,503	82,239	3,007	85,245
Total	67,319	0	67,319	67,319	0	67,319	70,717	3,266	73,983	85,347	4,052	89,399	85,345	4,054	89,399	85,163	3,979	89,142
Total MNCRR W/O Manhattan	4,135	73,682	77,817	4,135	73,682	77,817	13,012	80,598	93,610	17,030	97,954	114,983	17,031	97,951	114,982	17,134	97,948	115,083
Total MNCRR With Manhattan	71,454	73,682	145,136	71,454	73,682	145,136	83,729	83,864	167,592	102,376	102,006	204,382	102,376	102,005	204,380	102,297	101,927	204,225

TABLE A-11 YEAR 2020 WEEKDAY AM PEAK 4 HOUR COMMUTER RAIL RIDERSHIP BY BRANCH

Note: For determining Branch-level impacts only. Station-level data should be used with caution.

Node Station	AM Peak 4 Hours Counts						1995 BASE						YEAR 2020 ALTERNATIVES					
	1990 Counts			1995 Counts			1995 BASE NETWORK(NB95)			2020 NO-BUILD (NB23)			2020 TSM (TSM3)			2020 LIRR-GCT BUILD(GCT3)		
	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total
FAR ROCKAWAY BRANCH																		
3127 Far Rockaway	16	113	129	22	58	80	5	70	75	17	442	459	17	444	461	18	442	460
3126 Inwood	9	225	234	9	232	241	30	466	496	59	467	526	59	468	527	59	488	547
3125 Lawrence	17	253	270	17	263	280	4	519	524	9	560	569	9	562	571	9	599	607
3124 Cedarhurst	80	556	636	78	519	597	45	335	380	61	370	431	61	370	431	62	379	442
3123 Woodmere	48	597	645	56	630	686	30	617	647	43	714	757	43	713	756	42	719	761
3122 Hewlett	85	704	789	78	642	720	6	885	891	8	1030	1038	8	1031	1039	8	1,038	1,046
3121 Gibson	40	637	677	33	501	534	37	49	86	50	52	101	50	52	101	50	52	101
3097 Valley Stream	151	2,156	2,307	137	2,254	2,391	211	2,241	2,452	206	2,622	2,827	208	2,627	2,835	230	2,761	2,991
3096 Rosedale	21	1,276	1,297	21	1,058	1,079	155	741	896	228	998	1,226	235	1,000	1,235	242	1,150	1,392
3095 Laurelton	19	489	508	24	471	495	15	700	715	29	756	785	30	755	785	31	855	886
3094 Locust Manor	28	492	520	24	452	476	41	427	469	38	287	325	39	287	326	39	276	315
Total	514	7,498	8,012	499	7,080	7,579	578	7,052	7,630	748	8,298	9,045	759	8,308	9,067	790	8,758	9,549
HEMPSTEAD BRANCH																		
3120 Hempstead	235	1,029	1,264	264	800	1,064	62	973	1,034	88	1,098	1,186	88	1,099	1,187	97	1,233	1,330
3119 Country Life Press	11	347	358	11	298	309	4	335	340	3	381	384	3	382	385	3	425	429
3118 Garden City	118	577	695	115	581	696	65	242	307	96	314	410	96	314	410	101	333	434
3117 Nassau Blvd	76	655	731	73	677	750	68	384	462	90	469	559	90	469	559	91	800	891
3116 Stewart Manor	15	834	849	18	771	789	44	1,031	1,076	73	1,161	1,234	73	1,162	1,235	99	1,702	1,802
3115 Floral Park	60	1,270	1,330	63	1,231	1,294	71	1,262	1,333	94	1,274	1,368	94	1,275	1,370	82	743	824
3114 Bellerose	10	444	454	8	516	524	92	726	818	121	637	758	121	637	758	119	775	893
3008 Queens Village	32	579	611	33	474	507	24	640	664	39	730	769	41	740	781	49	1,132	1,181
3007 Hollis	6	56	62	7	53	60	17	78	95	40	74	114	41	74	115	45	165	210
Total	563	5,791	6,354	592	5,401	5,993	448	5,682	6,129	644	6,138	6,782	647	6,154	6,800	686	7,307	7,993

TABLE A-11 YEAR 2020 WEEKDAY AM PEAK 4 HOUR COMMUTER RAIL RIDERSHIP BY BRANCH

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Node Station	AM Peak 4 Hours Counts						1995 BASE						YEAR 2020 ALTERNATIVES					
	1990 Counts			1995 Counts			1995 BASE NETWORK(NB95)			2020 NO-BUILD (NB23)			2020 TSM (TSM3)			2020 LIRR-GCT BUILD(GCT3)		
	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total
OYSTER BAY																		
3108 Oyster Bay	22	51	73	22	57	79	20	8	29	21	10	31	22	14	36	22	9	31
3107 Mill Neck	1	2	3	1	2	3	2	139	141	3	207	210	3	226	229	3	213	216
3106 Locust Valley	30	186	216	28	180	208	21	202	223	24	284	308	26	310	336	24	294	318
3105 Glen Cove	7	146	153	11	147	158	27	74	101	29	108	137	32	115	147	30	110	140
3104 Glen St	10	153	163	18	149	167	1	244	245	1	349	350	2	388	390	1	358	359
3103 Sea Cliff	13	199	212	11	188	199	52	182	234	50	256	306	69	289	357	54	262	316
3102 Glen Head	9	196	205	13	264	277	5	252	257	6	380	386	7	453	460	7	387	393
3101 Greenvale	14	93	107	12	82	94	9	165	173	7	260	267	11	282	293	7	265	272
3100 Roslyn	51	205	256	52	234	286	36	244	279	28	327	355	32	379	411	31	347	378
3099 Albertson	29	167	196	32	170	202	45	191	236	32	257	289	34	321	355	32	272	304
3098 East Williston	21	492	513	16	459	475	11	489	500	5	707	713	8	802	810	6	612	618
Total	207	1,890	2,097	216	1,932	2,148	230	2,189	2,419	207	3,145	3,352	244	3,579	3,823	217	3,130	3,347
PORT JEFFERSON																		
3078 Port Jefferson	62	434	496	62	358	420	11	454	465	17	965	982	17	1,023	1,040	17	960	977
3077 Stony Brook	110	336	446	110	332	442	63	583	646	85	566	650	85	633	718	86	572	658
3076 St James	18	201	219	20	214	234	22	209	231	28	270	298	28	298	327	29	272	301
3075 Smithtown	39	485	524	42	490	532	53	575	628	70	867	937	70	920	990	70	870	940
3074 Kings Park	26	893	919	19	861	880	31	875	906	43	1,326	1,370	44	1,427	1,471	44	1,330	1,374
3073 Northport	65	1,133	1,198	75	1,041	1,116	50	1,125	1,175	70	1,347	1,417	71	1,468	1,539	71	1,334	1,405
3072 Greenlawn	13	388	401	10	424	434	39	590	630	56	33	89	56	89	146	57	24	81
3071 Huntington	394	4,485	4,879	273	4,664	4,937	109	3,910	4,019	141	7,929	8,070	143	8,532	8,675	149	7,501	7,650
3070 Cold Spring Harbor	36	1,010	1,046	37	1,036	1,073	20	780	800	27	968	995	27	764	791	29	1,292	1,321
3069 Syosset	217	2,009	2,226	206	2,352	2,558	173	2,533	2,707	223	3,252	3,475	226	3,237	3,463	242	3,629	3,871
3014 Hicksville	665	6,285	6,950	604	6,336	6,940	462	6,220	6,682	662	8,413	9,075	687	8,443	9,130	721	7,862	8,582
3013 Westbury	227	1,359	1,586	244	1,510	1,754	179	1,559	1,738	225	1,476	1,701	230	1,468	1,698	254	2,330	2,585
3012 Carle Place	29	297	326	33	296	329	477	211	688	559	261	820	567	261	828	537	23	559
3011 Mineola	810	2,509	3,319	641	2,287	2,928	376	1,852	2,227	423	2,464	2,887	437	2,497	2,935	515	2,298	2,812
3010 Merriln Ave	14	547	561	20	593	613	184	1,486	1,670	247	1,846	2,093	252	1,835	2,086	273	2,253	2,525
3009 New Hyde Park	65	1,152	1,217	81	1,187	1,268	193	1,770	1,963	201	2,443	2,644	205	2,446	2,651	251	3,269	3,520
Total	2,790	23,523	26,313	2,477	23,981	26,458	2,443	24,732	27,176	3,077	34,425	37,502	3,146	35,342	38,488	3,344	35,818	39,163

TABLE A-11 YEAR 2020 WEEKDAY AM PEAK 4 HOUR COMMUTER RAIL RIDERSHIP BY BRANCH

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Node Station	AM Peak 4 Hours Counts						1995 BASE						YEAR 2020 ALTERNATIVES											
	1990 Counts			1995 Counts			1995 BASE NETWORK(NB95)			2020 NO-BUILD (NB23)			2020 TSM (TSM3)			2020 LIRR-GCT BUILD(GCT3)								
	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total
WEST HEMPSTEAD																								
3132 West Hempstead	6	189	195	6	226	232	13	209	223	13	206	219	13	207	220	13	233	246						
3131 Hempstead Gardens	5	204	209	4	139	143	81	193	274	78	211	288	78	211	288	72	249	322						
3130 Lakeview	4	297	301	4	302	306	5	267	273	7	303	309	7	304	310	7	332	338						
3129 Malverne	11	565	576	10	524	534	8	523	531	9	612	621	9	613	622	10	692	701						
3128 Westwood	3	347	350	2	345	347	21	438	459	23	469	492	24	470	493	24	526	550						
3035 St Albans	0	40	40	0	39	39	20	79	99	29	49	78	29	48	77	35	224	260						
Total	29	1,642	1,671	26	1,575	1,601	150	1,709	1,859	158	1,849	2,007	160	1,852	2,012	161	2,257	2,418						
LIRR TOTALS																								
LIRR Total W/O Terminal Zone	8,344	106,416	114,760	8,133	106,102	114,235	8,591	107,886	116,476	11,069	138,232	149,301	11,254	139,967	151,221	12,026	150,630	162,656						
LIRR Total With Terminal Zone	113,231	113,776	227,007	112,843	113,574	226,417	113,043	113,715	226,758	143,978	144,814	288,792	145,120	146,576	291,696	158,817	159,670	318,488						

TABLE A-11 YEAR 2020 WEEKDAY AM PEAK 4 HOUR COMMUTER RAIL RIDERSHIP BY BRANCH

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Node Station	1990 Counts			1995 Counts			1995 BASE NETWORK(NB95)			YEAR 2020 ALTERNATIVES					
	AM Peak 4 Hours Counts									2020 NO-BUILD (NB23)			2020 TSM (TSM3)		
	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total
METRO NORTH															
HUDSON LINE															
3227 Poughkeepsie	0	661	661	0	661	661	127	784	911	194	1,100	1,294	193	1,100	1,293
3226 New Hamburg	0	619	619	0	619	619	12	787	799	22	1,080	1,102	22	1,080	1,102
3225 Beacon	5	921	926	5	921	926	44	872	916	94	1,305	1,399	94	1,305	1,399
3224 Cold Spring	2	307	309	2	307	309	7	374	381	10	455	464	10	455	464
3223 Garrison	0	203	203	0	203	203	2	251	253	2	315	317	2	315	317
3222 Peekskill	35	888	923	35	888	923	81	926	1,007	127	1,583	1,710	127	1,581	1,708
3221 Montrose	1	223	224	1	223	224	40	140	179	0	0	0	0	0	0
3220 Crogers	23	118	141	23	118	141	36	139	175	0	0	0	0	0	0
3219 Croton-Harmon	368	2,935	3,303	368	2,935	3,303	90	3,003	3,093	93	2,921	3,014	93	2,920	3,013
3218 Ossining	15	816	831	15	816	831	231	794	1,024	268	925	1,193	269	926	1,194
3217 Scarborough	1	716	717	1	716	717	43	912	955	47	1,138	1,185	47	1,139	1,186
3216 Philipse Manor	1	311	312	1	311	312	72	153	225	88	188	275	88	189	277
3215 Tarrytown	65	1,652	1,717	65	1,652	1,717	127	1,801	1,928	108	1,137	1,245	108	1,137	1,245
3214 Irvington	32	602	634	32	602	634	23	729	751	24	890	914	24	890	914
3213 Ardsley	13	142	155	13	142	155	0	436	436	0	32	32	0	32	32
3212 Dobbs Ferry	20	870	890	20	870	890	132	711	842	133	873	1,006	133	874	1,007
3211 Hastings	15	869	884	15	869	884	171	819	990	176	981	1,157	176	982	1,159
3210 Greystone	0	518	518	0	518	518	66	622	687	65	175	241	65	175	241
3209 Glenwood	1	249	250	1	249	250	40	291	330	39	707	747	39	707	747
3208 Yonkers	68	440	508	68	440	508	218	805	1,023	207	546	753	207	546	753
3207 Ludlow	3	190	193	3	190	193	75	533	608	80	446	526	80	446	527
3206 Riverdale	5	480	485	5	480	485	51	776	827	48	602	650	48	603	654
3205 Spuyten Duyvil	6	628	634	6	628	634	37	397	433	40	442	482	40	442	486
3204 Marble Hill	134	56	190	134	56	190	1,343	698	2,041	1,014	883	1,698	1,014	883	1,697
3203 University Heights	15	10	25	15	10	25	91	65	155	80	118	199	80	118	199
3202 Morris Heights	14	66	80	14	66	80	28	44	72	16	105	121	16	104	121
Total	842	15,490	16,332	842	15,490	16,332	3,184	17,859	21,043	2,975	18,747	21,723	2,975	18,744	21,720
													3,008	18,760	21,768

TABLE A-11 YEAR 2020 WEEKDAY AM PEAK 4 HOUR COMMUTER RAIL RIDERSHIP BY BRANCH

Note: For determining Branch-level impacts only. Station-level data should be used with caution.

Node Station	AM Peak 4 Hours Counts						1995 BASE						YEAR 2020 ALTERNATIVES					
	1990 Counts			1995 Counts			1995 BASE NETWORK(NB95)			2020 NO-BUILD (NB23)			2020 TSM (TSM3)			2020 LIRR-GCT BUILD(GCT3)		
	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total
HARLEM LINE																		
3259 Dover Plains	0	50	50	0	50	50	1	115	116	2	251	253	2	251	253	2	251	253
3258 Harlem Valley-Wingda	1	18	19	1	18	19	1	74	75	3	209	212	3	209	212	3	209	212
3257 Pawling	0	78	78	0	78	78	10	175	185	53	425	479	53	425	479	54	428	482
3256 Patterson	1	45	46	1	45	46	8	10	18	12	25	37	12	25	37	12	25	36
3255 Brewster North	27	568	595	27	568	595	2	598	600	4	913	916	4	913	916	4	914	918
3254 Brewster	1	774	775	1	774	775	69	354	423	105	538	643	105	538	643	105	538	643
3253 Croton Falls	9	322	331	9	322	331	3	715	718	10	1,027	1,037	10	1,027	1,037	10	1,028	1,038
3252 Purdy's	1	280	281	1	280	281	47	295	342	66	428	494	66	428	494	66	429	495
3251 Golden's Bridge	4	754	758	4	754	758	1	984	985	1	1,282	1,283	1	1,282	1,283	1	1,283	1,284
3250 Katonah	11	791	802	11	791	802	8	457	465	10	540	549	10	540	549	10	540	550
3249 Bedford Hills	10	496	506	10	496	506	112	528	640	147	625	771	147	625	771	148	625	772
3248 Mount Kisco	33	900	933	33	900	933	183	833	1,016	225	987	1,211	225	987	1,211	225	987	1,212
3247 Chappaqua	13	1,645	1,658	13	1,645	1,658	9	1,334	1,344	11	2,196	2,208	11	2,196	2,208	11	2,197	2,208
3246 Pleasantville	18	522	540	18	522	540	88	680	767	94	879	973	94	879	973	94	879	974
3245 Hawthorne	11	404	415	11	404	415	116	257	372	120	327	447	120	327	447	120	326	447
3244 Valhalla	5	185	190	5	185	190	63	208	271	73	262	335	73	262	335	73	262	335
3243 North White Plains	15	1,429	1,444	15	1,429	1,444	51	1,215	1,267	50	1,563	1,613	50	1,563	1,613	50	1,564	1,615
3242 White Plains	162	2,552	2,714	162	2,552	2,714	1,080	2,842	3,923	1,383	3,835	5,218	1,383	3,835	5,218	1,393	3,836	5,229
3241 Hartsdale	9	2,246	2,255	9	2,246	2,255	31	2,684	2,715	55	2,046	2,101	55	2,045	2,101	55	2,047	2,102
3240 Scarsdale	22	3,019	3,041	22	3,019	3,041	144	2,537	2,681	181	5,292	5,473	181	5,292	5,473	182	5,293	5,475
3239 Crestwood	3	1,363	1,366	3	1,363	1,366	85	2,059	2,145	116	2,744	2,859	118	2,744	2,862	119	2,744	2,862
3238 Tuckahoe	7	1,007	1,014	7	1,007	1,014	15	1,473	1,488	30	2,147	2,177	28	2,147	2,175	28	2,148	2,176
3237 Bronxville	17	2,011	2,028	17	2,011	2,028	97	1,883	1,980	129	2,655	2,783	129	2,655	2,783	129	2,655	2,784
3236 Fleetwood	5	1,880	1,885	5	1,880	1,885	45	1,587	1,631	62	2,433	2,494	62	2,433	2,494	62	2,433	2,495
3235 Mount Vernon West	115	833	948	115	833	948	167	1,006	1,173	194	401	596	194	401	596	195	401	596
3234 Wakefield	1	218	219	1	218	219	42	395	437	71	570	641	71	570	641	71	572	643
3233 Woodlawn	15	633	648	15	633	648	57	1,342	1,399	96	1,534	1,630	96	1,534	1,630	98	1,535	1,633
3232 Williams Bridge	26	92	118	26	92	118	147	593	740	270	978	1,248	270	978	1,248	280	983	1,263
3231 Botanical Garden	118	241	359	118	241	359	73	184	257	112	499	612	112	500	612	117	502	619
3230 Fordham	147	122	269	147	122	269	512	310	822	703	699	1,402	704	699	1,403	713	703	1,416
3229 Tremont	5	1	6	5	1	6	41	139	181	254	275	530	254	274	529	266	281	547
3228 Melrose	5	4	9	5	4	9	317	206	524	779	437	1,216	779	437	1,217	790	446	1,236
Total	817	25,483	26,300	817	25,483	26,300	3,629	28,071	31,700	5,419	39,023	44,442	5,421	39,022	44,443	5,484	39,063	44,547

TABLE A-11 YEAR 2020 WEEKDAY AM PEAK 4 HOUR COMMUTER RAIL RIDERSHIP BY BRANCH

Note: For determining Branch-level impacts only. Station-level data should be used with caution.

Node Station	AM Peak 4 Hours Counts						1995 BASE						YEAR 2020 ALTERNATIVES					
	1990 Counts			1995 Counts			1995 BASE NETWORK(NB95)			2020 NO-BUILD (NB23)			2020 TSM (TSM3)			2020 LIRR-GCT BUILD(GCT3)		
	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total
NEW HAVEN LINE																		
3297 Danbury	0	95	95	0	95	95	184	53	237	224	51	275	224	51	275	224	51	275
3296 Bethel	0	112	112	0	112	112	61	415	477	62	491	552	62	491	552	62	491	552
3295 Redding	1	60	61	1	60	61	2	238	240	2	310	312	2	310	312	2	311	313
3294 Branchville	5	175	180	5	175	180	11	99	110	11	121	133	11	121	133	11	121	132
3293 Cannondale	0	105	105	0	105	105	21	433	454	26	540	566	26	540	566	26	540	566
3291 Wilton (Kent Rd)	23	220	243	23	220	243	17	6	23	0	0	0	0	0	0	0	0	0
3290 Merritt 7	12	108	120	12	108	120	125	134	259	155	170	325	155	170	325	155	170	325
3289 New Canaan	0	984	984	0	984	984	44	944	988	75	899	975	75	894	969	75	900	975
3288 Talmadge Hill	1	334	335	1	334	335	7	782	789	13	1,492	1,505	13	1,497	1,510	13	1,492	1,505
3287 Springdale	0	318	318	0	318	318	59	184	253	99	295	393	99	287	385	99	295	393
3286 Glenbrook	1	348	349	1	348	349	114	543	657	189	816	1,005	189	825	1,013	189	817	1,005
3285 NewHaven	0	990	990	0	990	990	31	1,439	1,470	50	2,021	2,072	50	2,021	2,072	50	2,024	2,074
3284 Milford	17	618	635	17	618	635	5	17	23	6	20	26	6	20	26	6	20	26
3283 Stratford	11	546	557	11	546	557	232	522	755	263	748	1,011	263	748	1,011	263	748	1,012
3282 Bridgeport	121	388	509	121	388	509	530	607	1,137	614	1,235	1,848	614	1,235	1,848	614	1,236	1,850
3281 Fairfield	87	1,989	2,076	87	1,989	2,076	68	1,776	1,844	89	3,044	3,133	89	3,044	3,133	89	3,045	3,134
3280 Southport	9	151	160	9	151	160	88	310	398	107	3	110	107	3	110	107	3	110
3279 Green's Farms	13	551	564	13	551	564	10	602	612	13	799	812	13	799	812	13	799	812
3278 Westport	90	1,822	1,912	90	1,822	1,912	141	1,771	1,912	206	2,440	2,647	206	2,440	2,647	206	2,441	2,647
3277 East Norwalk	47	486	533	47	486	533	135	598	733	223	856	1,080	223	856	1,080	223	857	1,080
3276 South Norwalk	182	763	945	182	763	945	184	742	925	277	1,095	1,372	277	1,095	1,372	277	1,095	1,372
3275 Rowayton	5	525	530	5	525	530	29	65	94	34	96	129	34	96	129	34	96	129
3274 Darien	27	1,169	1,196	27	1,169	1,196	35	1,643	1,677	49	2,464	2,512	49	2,464	2,512	49	2,464	2,513
3273 Noroton Heights	2	965	967	2	965	967	148	940	1,088	180	1,428	1,608	180	1,428	1,608	180	1,428	1,608
3272 Stamford	976	2,572	3,548	976	2,572	3,548	2,212	2,658	4,869	3,880	3,621	7,502	3,881	3,621	7,502	3,881	3,622	7,503
3271 Old Greenwich	12	830	842	12	830	842	219	629	848	314	915	1,228	314	915	1,228	314	915	1,228
3270 Riverside	5	528	533	5	528	533	38	492	530	54	682	736	54	682	736	54	682	736
3269 Cos Cob	29	707	736	29	707	736	18	1,257	1,275	25	1,664	1,689	25	1,664	1,689	25	1,664	1,689
3268 Greenwich	214	1,838	2,052	214	1,838	2,052	403	896	1,299	697	1,169	1,865	697	1,169	1,865	697	1,169	1,866
3267 Port Chester	54	1,065	1,119	54	1,065	1,119	129	1,908	2,037	260	2,435	2,696	260	2,435	2,696	265	2,435	2,700
3266 Rye	26	1,643	1,669	26	1,643	1,669	132	1,713	1,845	167	2,121	2,288	167	2,121	2,288	167	2,121	2,288
3265 Harrison	30	1,409	1,439	30	1,409	1,439	55	1,587	1,642	81	1,918	1,999	81	1,918	1,999	82	1,918	1,999
3264 Mamaroneck	36	1,329	1,365	36	1,329	1,365	86	969	1,055	123	1,085	1,208	123	1,085	1,208	124	1,085	1,208
3263 Larchmont	28	2,641	2,669	28	2,641	2,669	81	2,291	2,372	105	2,661	2,766	105	2,661	2,766	105	2,661	2,766
3262 New Rochelle	86	1,653	1,739	86	1,653	1,739	171	1,968	2,139	226	2,129	2,355	226	2,129	2,355	226	2,129	2,355
3261 Pelham	14	1,769	1,783	14	1,769	1,783	65	1,761	1,826	77	1,994	2,070	77	1,994	2,070	77	1,994	2,071
3260 Mount Vernon	80	901	981	80	901	981	101	1,418	1,519	117	1,501	1,618	117	1,501	1,618	117	1,502	1,619
3505 Fordham	232	2	234	232	2	234	209	249	458	421	313	734	421	312	733	429	313	742
Total	2,476	32,709	35,185	2,476	32,709	35,185	6,199	34,668	40,867	9,512	45,641	55,153	9,512	45,640	55,152	9,528	45,651	55,179

TABLE A-11 YEAR 2020 WEEKDAY AM PEAK 4 HOUR COMMUTER RAIL RIDERSHIP BY BRANCH

Note: For determining Branch-level impacts only, Station-level data should be used with caution.

Node Station	AM Peak 4 Hours Counts						1995 BASE			YEAR 2020 ALTERNATIVES					
	1990 Counts			1995 Counts			1995 BASE NETWORK(NB95)			2020 NO-BUILD (NB23)			2020 TSM (TSM3)		
	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total	Offs	Ons	Total
MANHATTAN															
3500 125th St	864	0	864	864	0	864	2,454	774	3,228	2,850	824	3,674	2,846	822	3,667
3201 125th St			0			0	250	151	401	205	158	364	205	158	363
3200 NYC-Grand Central	66,455	0	66,455	66,455	0	66,455	68,014	2,340	70,354	86,989	3,145	90,134	86,989	3,151	90,140
Total	67,319	0	67,319	67,319	0	67,319	70,717	3,266	73,983	90,045	4,127	94,172	90,041	4,131	94,172
Total MNCRR W/O Manhattan	4,135	73,682	77,817	4,135	73,682	77,817	13,012	80,598	93,610	17,906	103,411	121,318	17,908	103,406	121,314
Total MNCRR With Manhattan	71,454	73,682	145,136	71,454	73,682	145,136	83,729	83,864	167,592	107,951	107,538	215,489	107,950	107,537	215,487

TABLE A-12 WEEKDAY AM PEAK 4 HOUR DRIVE-TO-COMMUTER RAIL VEHICLE TRIPS, VEHICLE MILES OF TRAVEL AND PARKED CARS BY BRANCH

Note: For determining Branch-level impacts only. Station-level data should be used with caution.

Node	Station	1995 BASE						YEAR 2010 ALTERNATIVES												YEAR 2020 ALTERNATIVES																							
		1995 BASE NETWORK(NB95)						2010 NO-BUILD (NB13)						2010 TSM (T310)						2010 LIRR-GCT BUILD(G310)						2020 NO-BUILD (NB23)						2020 TSM (TSM3)						2020 LIRR-GCT BUILD(GCT3)					
		Veh	Trips	MT	Parked	Veh.		Veh.	Trips	MT	Parked	Veh.		Veh.	Trips	MT	Parked	Veh.		Veh.	Trips	MT	Parked	Veh.		Veh.	Trips	MT	Parked	Veh.		Veh.	Trips	MT	Parked	Veh.		Veh.	Trips	MT	Parked		
FAR ROCKAWAY BRANCH	3127 Far Rockaway	32	2	17		106	138	201	138	107		202	139	107		212	146	112		213	146	113		212	146	113		212	146	113		212	146	113		212	146	113		212	146	113	
	3126 Inwood	332	614	176		595	178	336	596	178		349	622	185		352	626	187		353	627	187		366	653	194		366	653	194		366	653	194		366	653	194		366	653	194	
	3125 Lawrence	403	513	214		423	540	424	541	225		452	577	240		440	560	233		440	561	233		469	598	249		469	598	249		469	598	249		469	598	249		469	598	249	
	3124 Cedarhurst	302	88	160		327	95	173	326	95		334	97	177		342	99	181		342	99	181		351	102	186		351	102	186		351	102	186		351	102	186		351	102	186	
	3123 Woodmere	478	309	253		537	346	284	536	346		540	347	286		558	359	296		558	359	296		562	359	298		562	359	298		562	359	298		562	359	298		562	359	298	
	3122 Hewlett	874	690	463		977	771	518	978	772		986	778	522		1,018	803	539		1,019	804	540		1,026	810	544		1,026	810	544		1,026	810	544		1,026	810	544		1,026	810	544	
	3121 Gibson	61	35	32		68	39	68	39	36		68	39	36		72	41	38		72	41	38		72	41	38		72	41	38		72	41	38		72	41	38		72	41	38	
	3097 Valley Stream	1,988	2,088	1,054		2,191	2,266	1,161	2,198	2,274		2,309	2,402	1,224		2,293	2,385	1,215		2,299	2,392	1,218		2,425	2,534	1,285		2,425	2,534	1,285		2,425	2,534	1,285		2,425	2,534	1,285		2,425	2,534	1,285	
	3096 Rosedale	621	535	329		807	834	428	814	839		916	960	485		856	883	453		862	887	457		971	1,015	514		971	1,015	514		971	1,015	514		971	1,015	514		971	1,015	514	
	3095 Laurelton	506	248	268		522	299	277	523	299		590	339	313		556	320	295		556	320	295		628	363	333		628	363	333		628	363	333		628	363	333		628	363	333	
	3094 Locust Manor	386	204	205		259	133	137	259	133		252	115	133		270	139	143		271	139	144		262	120	139		262	120	139		262	120	139		262	120	139		262	120	139	
	Total	5,983	5,325	3,171		6,646	6,056	3,522	6,664	6,073		6,999	6,415	3,709		6,969	6,362	3,693		6,985	6,376	3,702		7,344	6,740	3,892		7,344	6,740	3,892		7,344	6,740	3,892		7,344	6,740	3,892		7,344	6,740	3,892	
HEMPSTEAD BRANCH	3120 Hempstead	791	1,508	435		842	1,618	463	854	1,627		952	1,812	524		901	1,709	495		901	1,710	496		1,010	1,906	555		1,010	1,906	555		1,010	1,906	555		1,010	1,906	555		1,010	1,906	555	
	3119 Country Life Press	289	594	159		309	655	170	310	657		345	718	190		327	689	180		328	690	180		365	755	201		365	755	201		365	755	201		365	755	201		365	755	201	
	3118 Garden City	242	51	133		284	60	156	304	64		304	64	167		323	69	178		323	69	178		342	72	188		342	72	188		342	72	188		342	72	188		342	72	188	
	3117 Nassau Blvd	283	207	156		315	230	173	320	233		509	370	280		342	249	188		342	249	188		545	396	300		545	396	300		545	396	300		545	396	300		545	396	300	
	3116 Stewart Manor	449	602	247		470	633	258	483	639		714	796	393		514	680	283		515	680	283		752	843	414		752	843	414		752	843	414		752	843	414		752	843	414	
	3115 Floral Park	1,054	1,303	580		1,000	1,243	550	1,020	1,253		559	832	308		1,080	1,326	594		1,082	1,327	595		652	937	359		652	937	359		652	937	359		652	937	359		652	937	359	
	3114 Bellerose	356	354	196		273	250	150	312	279		348	278	191		330	297	182		330	297	182		389	311	214		389	311	214		389	311	214		389	311	214		389	311	214	
	3008 Queens Village	441	445	243		474	502	261	489	517		735	831	404		512	542	282		520	550	286		788	889	434		788	889	434		788	889	434		788	889	434		788	889	434	
3007 Hollis	0	0	0		0	0	0	0	0		0	0	0		0	0	0		0	0	0		0	0	0		0	0	0		0	0	0		0	0	0		0	0	0		
Total	3,905	5,064	2,148		3,966	5,192	2,182	4,092	5,269		4,466	5,700	2,456		4,329	5,560	2,381		4,341	5,572	2,388		4,843	6,110	2,664		4,843	6,110	2,664		4,843	6,110	2,664		4,843	6,110	2,664		4,843	6,110	2,664		

TABLE A-12 WEEKDAY AM PEAK 4 HOUR DRIVE-TO-COMMUTER RAIL VEHICLE TRIPS, VEHICLE MILES OF TRAVEL AND PARKED CARS BY BRANCH

Note: For determining Branch-level impacts only. Station-level data should be used with caution.

Node	Station	1995 BASE						YEAR 2010 ALTERNATIVES						YEAR 2020 ALTERNATIVES								
		1995 BASE NETWORK(NB95)			2010 NO-BUILD (NB23)			2010 TSM (T310)			2010 LIRR-GCT BUILD(G310)			2020 NO-BUILD (NB23)			2020 TSM (TSM3)			2020 LIRR-GCT BUILD(GCT3)		
		Veh Trips	VMT	Parked	Veh Trips	VMT	Parked	Veh Trips	VMT	Parked	Veh Trips	VMT	Parked	Veh Trips	VMT	Parked	Veh Trips	VMT	Parked	Veh Trips	VMT	Parked
OYSTER BAY																						
3108	Oyster Bay	22	19	12	22	17	12	25	20	14	22	17	13	24	18	13	27	22	15	24	18	13
3107	Mill Neck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3106	Locust Valley	187	211	105	247	281	138	269	306	151	255	292	143	259	294	145	282	320	158	268	306	150
3105	Glen Cove	88	28	49	113	32	63	121	35	68	115	33	65	119	34	67	128	37	72	122	35	68
3104	Glen St	200	268	112	273	363	153	304	404	170	280	375	157	287	381	161	319	425	179	294	394	165
3103	Sea Cliff	192	145	107	239	186	134	279	211	156	247	192	138	250	195	140	292	221	164	259	202	145
3102	Glen Head	241	309	135	333	433	186	397	555	222	339	438	190	361	472	202	430	604	241	368	477	206
3101	Greenvale	173	229	97	245	329	137	268	359	150	249	334	140	267	362	150	293	394	164	272	368	153
3100	Roslyn	240	260	134	297	328	166	343	379	192	316	349	177	310	342	173	358	395	200	330	364	185
3099	Albertson	203	227	114	238	288	133	292	364	164	250	299	140	249	301	139	305	380	171	261	313	146
3098	East Williston	378	363	212	515	512	289	586	596	328	446	429	250	539	535	302	613	622	343	467	449	262
	Total	1,925	2,060	1,078	2,521	2,769	1,412	2,885	3,228	1,616	2,520	2,759	1,411	2,665	2,934	1,492	3,048	3,419	1,707	2,665	2,924	1,493
PORT JEFFERSON																						
3078	Port Jefferson	338	1,413	223	628	2,428	415	679	2,611	448	651	2,491	429	716	2,747	473	759	2,914	501	714	2,745	472
3077	Stony Brook	559	2,499	369	516	1,660	340	553	1,766	365	494	1,513	326	563	1,750	372	622	1,982	410	570	1,790	376
3076	St James	203	425	134	234	454	155	257	502	169	236	460	156	262	509	173	287	563	189	264	515	175
3075	Smithtown	552	1,038	364	746	1,410	492	788	1,490	520	749	1,415	494	827	1,567	546	874	1,656	577	830	1,572	548
3074	Kings Park	854	1,697	563	1,162	2,309	767	1,247	2,486	823	1,166	2,315	770	1,291	2,564	852	1,386	2,765	915	1,294	2,570	854
3073	Northport	1,090	2,977	719	1,190	3,691	786	1,278	3,871	844	1,184	3,701	782	1,314	4,060	867	1,427	4,277	942	1,304	4,067	860
3072	Greenlawn	539	983	356	66	90	44	111	153	73	62	79	41	76	104	50	125	173	82	69	88	46
3071	Huntington	3,723	12,043	2,457	6,771	23,147	4,469	7,297	24,941	4,816	6,410	21,098	4,231	7,485	25,601	4,940	8,048	27,502	5,312	7,093	23,355	4,681
3070	Cold Spring Harbor	753	1,370	497	855	1,381	564	677	1,087	447	1,132	1,956	747	936	1,512	618	744	1,195	491	1,243	2,146	820
3069	Syosset	2,518	5,147	1,662	3,066	6,346	2,024	3,060	6,301	2,020	3,401	6,982	2,245	3,232	6,702	2,133	3,221	6,652	2,126	3,601	7,386	2,376
3014	Hicksville	5,761	10,540	3,803	7,437	13,832	4,908	7,474	13,886	4,933	7,020	12,888	4,633	7,799	14,512	5,147	7,838	14,571	5,173	7,346	13,501	4,849
3013	Westbury	1,493	2,094	985	1,387	1,665	915	1,393	1,666	920	2,068	2,774	1,365	1,461	1,754	964	1,459	1,741	963	2,221	3,018	1,466
3012	Carle Place	440	435	290	481	456	318	505	484	333	317	343	210	524	500	346	529	505	349	358	387	236
3011	Mineola	1,603	1,520	1,058	1,984	1,889	1,309	2,018	1,919	1,332	1,892	1,771	1,249	2,082	1,981	1,374	2,116	2,011	1,396	1,994	1,860	1,316
3010	Merrion Ave	1,444	1,051	953	1,696	1,199	1,119	1,695	1,188	1,119	2,033	1,507	1,342	1,810	1,278	1,195	1,804	1,264	1,191	1,284	1,615	1,441
3009	New Hyde Park	1,508	1,026	995	1,902	1,253	1,255	1,907	1,254	1,258	2,478	1,889	1,636	2,035	1,340	1,343	2,038	1,341	1,345	2,713	2,043	1,790
	Total	23,378	46,258	15,430	30,122	63,211	19,880	30,940	65,605	20,420	31,293	63,181	20,653	32,413	68,482	21,392	33,278	71,112	21,964	33,797	68,658	22,306

TABLE A-12 WEEKDAY AM PEAK 4 HOUR DRIVE-TO-COMMUTER RAIL VEHICLE TRIPS, VEHICLE MILES OF TRAVEL AND PARKED CARS BY BRANCH

Note: For determining Branch-level impacts only, Station-level data should be used with caution.

Node	Station	1995 BASE						YEAR 2010 ALTERNATIVES						YEAR 2020 ALTERNATIVES					
		1995 BASE NETWORK(NB95)			2010 NO-BUILD (NB13)			2010 TSM (T310)			2010 LIRR-GCT BUILD(G310)			2020 NO-BUILD (NB23)			2020 TSM (TSM3)		
		Veh Trips	VTM	Parked Veh.	Veh Trips	VTM	Parked Veh.	Veh Trips	VTM	Parked Veh.	Veh Trips	VTM	Parked Veh.	Veh Trips	VTM	Parked Veh.	Veh Trips	VTM	Parked Veh.
METRO NORTH																			
HUDSON LINE																			
	3227 Poughkeepsie	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3226 New Hamburg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3225 Beacon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3224 Cold Spring	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3223 Garrison	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3222 Peekskill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3221 Montrose	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3220 Crugers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3219 Croton-Harmon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3218 Ossining	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3217 Scarborough	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3216 Philipse Manor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3215 Tarrytown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3214 Irvington	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3213 Ardsley	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3212 Dobbs Ferry	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3211 Hastings	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3210 Greystone	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3209 Glenwood	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3208 Yonkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3207 Ludlow	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3206 Riverdale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3205 Spuyten Duyvil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3204 Marble Hill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3203 University Heights	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3202 Morris Heights	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE A-12 WEEKDAY AM PEAK 4 HOUR DRIVE-TO-COMMUTER RAIL VEHICLE TRIPS. VEHICLE MILES OF TRAVEL AND PARKED CARS BY BRANCH

Note: For determining Branch-level impacts only. Station-level data should be used with caution.

Node	Station	1995 BASE						YEAR 2010 ALTERNATIVES						YEAR 2020 ALTERNATIVES					
		1995 BASE NETWORK(NB95)			2010 NO-BUILD (NB13)			2010 TSM (T310)			2010 LIRR-GCT BUILD(G310)			2020 NO-BUILD (NB23)			2020 TSM (TSM3)		
		Veh	Trips	Parked	Veh	Trips	Parked	Veh	Trips	Parked	Veh	Trips	Parked	Veh	Trips	Parked	Veh	Trips	Parked
HARLEM LINE																			
	3259 Dover Plains	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3258 Harlem Valley-Wingda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3257 Pawling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3256 Patterson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3255 Brewster North	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3254 Brewster	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3253 Croton Falls	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3252 Purdy's	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3251 Golden's Bridge	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3250 Katonah	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3249 Bedford Hills	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3248 Mount Kisco	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3247 Chappaqua	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3246 Pleasantville	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3245 Hawthorne	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3244 Valhalla	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3243 North White Plains	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3242 White Plains	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3241 Hartsdale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3240 Scarsdale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3239 Crestwood	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3238 Tuckahoe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3237 Bronxville	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3236 Fleetwood	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3235 Mount Vernon West	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3234 Wakefield	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3233 Woodlawn	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3232 Williams Bridge	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3231 Botanical Garden	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3230 Fordham	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3229 Tremont	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3228 Melrose	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE A-12 WEEKDAY AM PEAK 4 HOUR DRIVE-TO-COMMUTER RAIL VEHICLE TRIPS, VEHICLE MILES OF TRAVEL AND PARKED CARS BY BRANCH

Note: For determining Branch-level impacts only. Station-level data should be used with caution.

Node	Station	1995 BASE						YEAR 2010 ALTERNATIVES						YEAR 2020 ALTERNATIVES					
		1995 BASE NETWORK(NB95)			2010 NO-BUILD (NB13)			2010 TSM (T310)			2010 LIRR-GCT BUILD(G310)			2020 NO-BUILD (NB23)			2020 TSM (TSM3)		
		Veh Trips	VMt	Parked Veh.	Veh Trips	VMt	Parked Veh.	Veh Trips	VMt	Parked Veh.	Veh Trips	VMt	Parked Veh.	Veh Trips	VMt	Parked Veh.	Veh Trips	VMt	Parked Veh.
NEW HAVEN LINE																			
3297	Danbury	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3296	Bethel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3295	Redding	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3294	Branchville	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3293	Cannondale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3291	Wilton (Kent Rd)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3290	Merritt 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3289	New Canaan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3288	Talmadge Hill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3287	Springdale	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3286	Glenbrook	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3285	NewHaven	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3284	Milford	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3283	Strafford	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3282	Bridgeport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3281	Fairfield	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3280	Southport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3279	Green's Farms	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3278	Westport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3277	East Norwalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3276	South Norwalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3275	Rowayton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3274	Darien	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3273	Noroton Heights	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3272	Stamford	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3271	Old Greenwich	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3270	Riverside	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3269	Cos Cob	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3268	Greenwich	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3267	Port Chester	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3266	Rye	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3265	Harrison	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3264	Mamaroneck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3263	Larchmont	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3262	New Rochelle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3261	Pelham	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3260	Mount Vernon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3505	Fordham	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE A-12 WEEKDAY AM PEAK 4 HOUR DRIVE-TO-COMMUTER RAIL VEHICLE TRIPS, VEHICLE MILES OF TRAVEL AND PARKED CARS BY BRANCH

Note: For determining Branch-level impacts only. Station-level data should be used with caution.

Node Station	1995 BASE						YEAR 2010 ALTERNATIVES						YEAR 2020 ALTERNATIVES					
	1995 BASE NETWORK(NB95)			2010 NO-BUILD (NB13)			2010 TSM (T310)			2010 LIRR-GCT BUILD(G310)			2020 NO-BUILD (NB23)			2020 TSM (TSM3)		
	Veh Trips	VMT	Parked Veh.	Veh Trips	VMT	Parked Veh.	Veh Trips	VMT	Parked Veh.	Veh Trips	VMT	Parked Veh.	Veh Trips	VMT	Parked Veh.	Veh Trips	VMT	Parked Veh.
MANHATTAN																		
3500 125th St	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3201 125th St	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3200 NYC-Grand Central	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total MNCRR W/O Manhattan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total MNCRR With Manhattan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table A-13

Weekday AM Peak 1-Hour Subway Passengers On-Board East Side Subways by Location

				BASE		YEAR 2010 ALTERNATIVES				YEAR 2020 ALTERNATIVES				
MNR: LIRR:		0.355 0.355	1995 Capacity	1995 Count 1 Hour	1995 Actual V/C	(NB95)	(NB13)		(T310)	(G310)	(NB23)	(TSM3)	(GCT3)	
						1995 BASE NETWORK	2010 NO-BUILD	2010 TSM	2010 LIRR- GCT BUILD	2020 NO-BUILD	2020 TSM	2020 LIRR- GCT BUILD		
Lexington Avenue														
4/5	149th St/138th Street		31,900	18,455	0.58	22,033	22,203	22,349	22,233	23,631	23,692		23,553	
	125th Street		31,900	24,270	0.76	27,453	28,914	28,968	28,928	30,705	30,775		30,748	
	86th Street		29,700	32,060	1.08	29,775	32,200	32,302	32,203	33,765	33,853		33,667	
	59th Street		28,600	24,980	0.87	28,592	27,783	27,937	27,898	28,950	29,054		28,973	
	Grand Central		25,300	29,390	1.16	29,137	29,657	29,673	31,137	30,603	30,745		32,497	
	14th Street		25,300	23,380	0.92	25,619	25,224	25,238	26,456	25,931	26,037		27,498	
	Brooklyn Bridge		25,300	20,860	0.82	22,880	23,466	23,487	24,386	24,103	24,252		25,279	
	Total			173,395		185,488	189,447	189,953	193,241	197,688	198,409		202,215	
	6	3rd Avenue		26,400	14,245	0.54	14,966	17,049	17,060	17,046	18,328	18,371		18,361
		125th Street		26,400	9,940	0.38	5,469	6,585	6,673	6,588	7,192	7,232		7,136
86th Street			26,400	17,720	0.67	12,808	13,613	13,658	13,656	14,295	14,348		14,477	
68th Street			26,400	19,890	0.75	17,789	17,901	17,952	17,969	18,564	18,611		18,725	
59th Street			26,400	17,960	0.68	19,764	19,453	19,560	19,454	20,129	20,214		20,225	
Grand Central			26,400	15,050	0.57	15,983	16,253	16,282	16,615	16,811	16,831		17,025	
14th Street			26,400	7,550	0.29	7,023	6,513	6,581	6,804	6,786	6,851		7,031	
Total				102,355		93,802	97,367	97,766	98,131	102,105	102,457		102,980	
Total				275,750		279,290	286,814	287,720	291,372	299,794	300,866		305,196	
East Side Totals														
Lexington Ave														
4/5/6	125th Street			34,210		32,922	35,498	35,641	35,516	37,897	38,007		37,884	
4/5/6	86th Street			49,780		42,583	45,813	45,960	45,858	48,060	48,201		48,144	
4/5/6	59th Street			42,940		48,356	47,235	47,496	47,352	49,079	49,269		49,198	
4/5/6	Grand Central			44,440		45,120	45,911	45,954	47,752	47,414	47,576		49,522	
4/5/6	14th Street			30,930		32,641	31,736	31,820	33,259	32,717	32,887		34,529	
4/5	Brooklyn Bridge			20,860		22,880	23,466	23,487	24,386	24,103	24,252		25,279	
Total	Total			223,160		224,502	229,660	230,358	234,124	239,270	240,193		244,557	

Table A-14

Weekday AM Peak 1-Hour Subway Passengers On-Board Line at Maximum Load Point

YEAR 2010 ALTERNATIVES												YEAR 2020 ALTERNATIVES			
				BASE											
				(NB95) 1995 BASE NETWORK	(NB13) 2010 NO-BUILD	(T310) 2010 TSM	(G310) 2010 LIRR- GCT BUILD	(NB23) 2020 NO-BUILD	(TSM3) 2020 TSM	(GCT3) 2020 LIRR- GCT BUILD					
				Est. 1 Hr.	Est. 1 Hr.	Est. 1 Hr.	Est. 1 Hr.	Est. 1 Hr.	Est. 1 Hr.	Est. 1 Hr.					
												Est. 1 Hr.	Est. 1 Hr.	Est. 1 Hr.	
North of 60th Street												18,191	18,707	18,682	18,692
1/9	103rd Street	17,600	14,970	0.85	15,043	18,153	18,196	18,191	18,707	18,682	18,692				
2/3	72nd Street	24,090	20,560	0.85	20,009	23,894	23,741	23,975	24,954	24,800	24,902				
A/D	125th Street	28,180	16,420	0.58	16,746	18,521	18,498	18,524	19,591	19,627	19,581				
B/C	72nd Street	15,660	9,620	0.61	10,605	12,112	12,111	12,047	12,586	12,519	12,476				
Q	Roosevelt Island	12,600	1,441	0.11	1,095	16,495	16,515	16,048	17,419	17,319	16,888				
4/5	86th Street	29,700	32,060	1.08	29,775	32,200	32,302	32,203	33,765	33,853	33,667				
6	68th Street	26,400	19,890	0.75	17,789	17,901	17,952	17,969	18,564	18,611	18,725				
Total			114,961		111,061	139,275	139,316	138,956	145,585	145,411	144,932				
Queens															
N	Queensboro Plaza	15,587	13,620	0.87	14,472	17,865	17,880	17,823	18,714	18,816	18,521				
R/T	Queens Plz	15,455	12,680	0.82	11,921	8,901	8,864	8,941	9,402	9,379	9,475				
E/F	23rd Street	42,600	48,190	1.13	46,384	39,027	38,875	38,299	40,727	40,679	40,092				
7	33rd Street	30,250	24,320	0.80	23,336	25,901	25,708	24,578	27,014	26,829	25,690				
Total			98,810		96,113	91,695	91,328	89,640	95,858	95,703	93,778				
North Brooklyn															
L	Bedford Avenue	15,080	12,420	0.82	11,641	14,435	14,435	14,428	15,051	15,092	15,106				
J/M/Z	Marcy Avenue	22,040	13,000	0.59	14,041	17,155	17,008	17,189	17,976	17,847	17,953				
Total			25,420		25,682	31,590	31,444	31,617	33,026	32,939	33,059				
South Brooklyn															
F	Bergen Street	21,000	16,510	0.79	19,643	20,119	20,051	20,111	21,035	20,981	21,021				
B/N	36th Street	22,936	18,890	0.82	18,648	20,251	20,255	20,184	21,037	21,067	21,240				
D/Q	7th Avenue	30,800	20,320	0.66	22,681	26,660	26,677	26,653	27,919	27,954	27,926				
A/C	High Street	34,804	26,640	0.77	28,442	27,945	28,001	27,862	29,302	29,316	29,208				
2/3	Atlantic Avenue	20,900	15,470	0.74	14,313	15,528	15,537	15,473	16,377	16,321	16,268				
M/R	DeKalb Avenue	20,520	9,010	0.44	6,665	6,009	5,969	5,982	6,297	6,322	6,308				
4/5	Atlantic Avenue	29,700	26,680	0.90	26,477	29,687	29,936	29,356	31,025	31,228	30,492				
G	Clinton-Washington	6,300	4,280	0.68	3,395	3,116	3,114	3,115	3,318	3,316	3,316				
S	Botanic Gardens	2,450	0	0.00	1,031	960	960	960	1,022	1,022	1,022				
Total			137,800		141,295	150,275	150,501	149,696	157,333	157,527	156,802				