

Ridership Report

APPENDIX B

MTA Metro-North Railroad Penn Station Access Project

2025 Travel Demand Forecast Summary Report

Revised March 12, 2021

Review Draft

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Executive Summary

In support of the Penn Station Access Study (PSA), Metro-North Railroad (MNR) developed ridership forecasts for the Proposed Project / Action Alternative for a study target year of 2025. These ridership forecasts were compared to forecasts for the No Action Alternative (2025) to understand the ridership changes anticipated with the implementation of a new MNR service connecting New Haven Line (NHL) customers in Connecticut and New York to four new stations in the Eastern Bronx and Penn Station New York (PSNY). Today, MNR NHL service terminates at Grand Central Terminal (GCT). PSA provides new service for NHL customers to PSNY and adds four New Bronx Stations.

This report includes a description of the travel demand forecasting methodology as well as the results of the ridership analysis.

The MTA's Regional Transit Forecasting Model was used to conduct the study. NYMTC socio-economic forecasts were input into the model. In addition, new riders induced by the new service to the Bronx Stations was also estimated

Key findings of the Proposed Project ridership analysis include:

- Total average daily ridership on the NHL is forecast to grow by 9% with PSA adding **13,500 average weekday daily riders**.
- The Proposed Project / Action Alternative is forecast to shift **13% (4,990 riders) of AM Peak Period (6-10AM) inbound NHL riders to PSNY from GCT/125th Street**.
- The proposed New Bronx Stations would attract nearly 13,750 daily trips (ons and offs / boardings and alightings) including **5,730 new trips from induced demand** due to the presence of the new Bronx Stations and access to new development and jobs in Manhattan and along the NHL (section 2.3).
- Of riders boarding the new Bronx Stations in the AM Peak Period, **over 70% are traveling outbound in the reverse peak direction** to destinations in New York and Connecticut.

PSA PROPOSED PROJECT RIDERSHIP GROWTH

The Proposed Project / Action Alternative is forecast to generate 30,550 daily one-way person trips. Approximately 57% (17,530) of those trips are diverted from Metro-North Railroad (MNR) NHL GCT service and 43% (13,020) are new trips (Table ES-1). New trips include those that are diverted or shifted from auto or other transit modes, as well as new trips from induced demand. Induced demand is the additional ridership generated by the increased accessibility created by the four New Bronx Stations. These are riders that would not have made the trip, or traveled using the rail mode, except for the presence of the new rail station and service (see section 2.3).

Table ES-1: Proposed Project - 2025 Daily One-Way Person Trips - Total

Description	2025 Daily One-Way Person Trips
Trips Diverted from NHL GCT Service	17,530
New PSA Trips	13,020
TOTAL	30,550

Source: MTA

Of the 13,020 new daily one-way person trips, 22% (2,850 trips) are diverted from auto and 44% (5,730 trips) are induced trips and the balance are diverted from other transit (e.g., NYCT bus or subway) or other MNR lines (Table ES-2).

Table ES-2: Proposed Project - 2025 Daily One-Way Person Trips – New Trips

Description	2025 Daily One-Way Person Trips
Trips diverted from auto	2,850
Trips diverted from other transit mode	3,700
Induced trips	5,730
Trips diverted from other Metro-North lines	740
TOTAL	13,020

Source: MTA

DIVERSION OF TRIPS FROM GCT TO PSNY

The Proposed Project / Action Alternative forecasts 5,010 trips would be diverted from GCT to PSNY and 6,040 inbound trips would be added into PSNY in the AM Peak Period. Connecticut riders account for approximately 57% (3,420 trips) of the AM Peak Period inbound trips to PSNY, while 43% (2,620 trips) are trips from Westchester and the Bronx. Table ES-3 shows the change in 2025 AM Peak Period inbound trips to GCT and PSNY under the Action Alternative and the No Action Alternative (see section 3.3).

Table ES-3: Proposed Project - 2025 AM Peak Period Inbound PSNY vs. GCT

NHL Stations	2025 AM Peak Period Inbound Offs				
	No Action Alternative	Proposed Project/ Action Alternative		Change vs. No Action	
	GCT	GCT	PSNY	GCT	PSNY
CT Stations	25,000	21,560	3,420	-3,440	+3,420
NY and Bronx Stations	13,380	11,830	2,620	-1,550	+2,620
TOTAL	38,380	33,390	6,040	-4,990	+6,040

Source: MTA

RIDERSHIP AT NEW BRONX STATIONS

The four New Bronx Stations are forecast to serve 13,750 daily trips. As shown on Table ES-4, the proposed Morris Park station is expected to have the highest daily trips with 29% (3,960 trips) of all new Bronx stations. As noted previously, 42% (5,730 trips) of the 13,750 Bronx station daily trips are induced (see Section 3.5).

Table ES-4: Proposed Project - 2025 Daily Ons and Offs at New Bronx Stations*

New Bronx Station	2025 Daily Ons and Offs
Co-Op City	3,460
Morris Park	3,960
Parkchester	3,410
Hunts Point	2,920
TOTAL	13,750

Source: MTA

Note: *Ons are defined/same as Boardings. Offs are defined/same as Alightings.

Improved accessibility for reverse commuting in the Proposed Project / Action Alternative is evidenced by the 2,660 AM Peak Period trips originating at the Bronx stations and traveling outbound to Westchester and Connecticut. As shown in Table ES-5A, Parkchester has the highest AM Peak Period outbound trips (840 trips) and Co-op City has the highest AM Peak Period inbound trips to PSNY (580 trips). Table 5A shows 2025 AM Peak Period (6-10AM) trips inbound (to PSNY) and outbound (towards Westchester/CT) at the New Bronx Stations for the Proposed Project.

Table ES-5A: Proposed Project – 2025 AM Peak Period Ons and Offs at New Bronx Stations (Inbound and Outbound)

New Bronx Stations	2025 AM Peak Period Inbound (to PSNY)			2025 AM Peak Period Outbound (towards Westchester/CT)		
	Ons	Offs	Total	Ons	Offs	Total
Co-Op City	580	120	700	500	40	540
Morris Park	140	530	670	610	150	760
Parkchester	210	160	370	840	20	860
Hunts Point	10	330	340	710	<10	710
TOTAL	940	1,140	2,080	2,660	210	2,870

Source: MTA

Table ES-5B shows the Proposed Project / Action Alternative - 2025 AM Peak Hour Ons and Offs at New Bronx Stations (Inbound and Outbound) and Total Passenger Movements. As shown in Table ES-5B, Parkchester has the highest AM Peak Hour outbound trips (360 trips) and Co-op City has the highest AM Peak Hour inbound trips to PSNY (260 trips).

Table ES-5B: Proposed Project - 2025 AM Peak Hour Ons and Offs at New Bronx Stations (Inbound and Outbound)

New Bronx Stations	2025 AM Peak Hour Inbound (to PSNY)			2025 AM Peak Hour Outbound (towards Westchester/CT)			TOTAL Trips
	Ons	Offs	Total	Ons	Offs	Total	
Co-Op City	260	50	310	220	10	230	540
Morris Park	60	230	290	260	60	320	610
Parkchester	80	70	150	360	10	370	520
Hunts Point	10	140	150	300	10	310	460
TOTAL	410	490	900	1,140	90	1,230	2,130

Source: MTA

1 Introduction

This report outlines the methods used to forecast ridership for the Metro-North Penn Station Access Project (PSA). The ridership forecasts include estimates for new commuter rail stations in the Bronx, along with increased ridership along the New Haven Line (NHL). Shifts in ridership are also forecast from the existing Grand Central Terminal (GCT). NHL service to New York Penn Station (PSNY) NHL service and net change in total commuter rail and transit ridership. The forecasts also include estimates of “induced demand” which quantifies additional ridership generated by the four new rail stations and the increased accessibility that occurs with building new rail stations.

The report also outlines forecasting models used for this project, service assumptions, demographic forecasts and other factors that were used to generate the ridership forecasts.

The report is organized as follows:

- Methodology
- Key Assumptions
- Year 2025 Forecast Summaries
- Diversions and Mode Shifts
- Reduction in Vehicles Miles Traveled (VMT)
- Induced Demand
- Summary Findings

2 Model Description and Assumptions

2.1 METHODOLOGY

The MTA Regional Transit Forecasting Model (RTFM) is a travel demand forecasting model that is generally consistent with the four-step demand forecasting process used throughout the United States. The RTFM is the primary tool used to forecast ridership for this project. This model estimates transit ridership for different infrastructure and policy scenarios using the following methodology:

- Start with a representation of today's travel patterns in terms of trip origin, trip destination, and trip purpose;
- Estimate the effect that changes to population, employment, and the transportation system will have on future travel patterns;
- Use characteristics such as travel time and cost of each of the available modes of travel (e.g., automobile, commuter rail, subway and bus) to determine the share of trips using each mode; and
- Determine the path (e.g., particular highways, trains, stations, etc.) that will be used to make each trip.

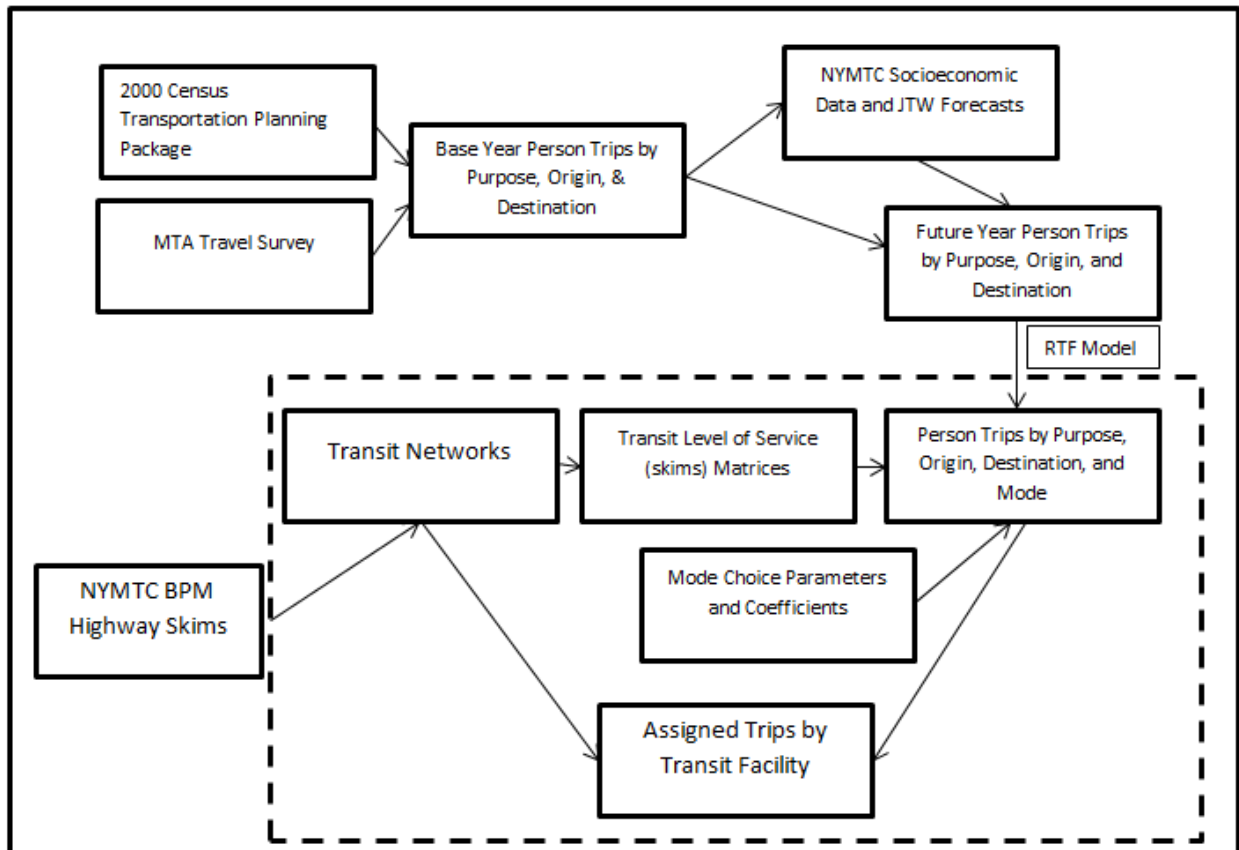
Although this process is generally similar to the four-step process used throughout the United States, the MTA RTFM departs from the traditional approach by replacing the trip generation and distribution components of the four-step approach with a survey/census-derived trip table representing current conditions and a trip table factoring procedure designed to represent the impact of population and employment growth on future travel.

The RTFM process is diagrammed in Figure 1. As shown in Figure 1, the transit network development, mode choice, and assignment procedures are included in the main implementation of the RTFM. Base trip table development and the representation of highway levels of service are exogenous inputs to the RTFM that have been prepared either by NYMTC (the MPO for the region) or by AECOM. As part of the development of the model but are created using one-time procedures to create the data sets for input to the various transit scenarios to be studied. Results in this report are rounded to the nearest ten for ridership related results consistent with the order of magnitude level of detail of the forecasts.

2.1.1 Relation to Previous Efforts

The RTFM is designed to support the MTA's Long Range Planning Framework process which identifies long term capital transportation needs and solutions to address those needs. The RTFM is explicitly designed for future network expansion planning and analysis as well as analysis of other critical MTA planning initiatives.

Figure 1: Overview of RTFM Model



Source: AECOM,

2.1.2 Induced Demand

In addition to the RTFM based forecasts, induced demand from the four new Bronx stations was estimated for 2025. The induced demand at the new Bronx stations is estimated as 5,730 trips daily. Appendix B describes the process of estimating Induced demand for the Bronx stations using data from other examples in New Jersey, Boston, and exiting Metro North reverse commuter patterns. "Induced" ridership demand has been found to account for 5% to 35% of the ridership at new rail stations. This is based on surveys of riders typically conducted within one to three years after the opening of new rail service. This "induced" ridership typically consists of riders that would not have made the trip, or traveled using the rail mode, except for the presence of the new rail station or service.

A new rail station can also result in changes in the distribution of travel, such as the origin of workers traveling to a nearby employment center, or the location of destinations or mode used by nearby residents of a station. A new rail station or service can shift these existing trip distribution patterns by making travel faster and more convenient due to the increased accessibility from the new train station. These riders are not diversions of previous rail users or other travel modes in the vicinity of the station. Typically, the changes in commuting patterns resulting from the improved accessibility of a new rail station are not accounted for in the ridership forecasts for a project. The changes in travel times to/from the new Bronx stations, including access/egress from stations can

range up to a savings of 45 minutes of travel time. For PSA, Induced Bronx station ridership was estimated outside of the modeling process as an add-on to base ridership

Induced demand for the Bronx stations is indicated in Table 2 under Section 2.3. More detail is provided in Appendix B.

2.2 KEY ASSUMPTIONS

This section lists the key assumptions used in forecasting the Proposed Project / Action Alternative and the No Action Alternative. Key assumptions include the forecast year, demographics used to generate trip tables for average weekday travel, and the NHL service plan for the AM Peak Period.

The forecasts were updated by modifying the service plans used for the Proposed Project / Action Alternative and the No Action Alternative, to reflect more recent train service levels and patterns. The model reporting methodology was also modified to be able to separate trips bound for GCT and to PSNY.

2.2.1 Forecast Year

Forecasts presented in this report were prepared for an average weekday in 2025.

2.2.2 Demographics

The primary project forecasts are for the year 2025 based on the 2005 Best Practices Model (BPM) and using NYTMC's demographic forecasts prepared in 2013. A Fratar process was applied to the base year trip table to grow them to 2025.

2.2.3 Service Plan

Train schedules for the 4-hour AM Peak Period were used to develop service plan inputs to the ridership forecasting model. The service plan used to model results reflects train patterns and times on the NHL and Branch Lines from 6 AM to 10 AM in both directions.

Table 1 summarizes inbound train starts by service territory for the base year (Fall 2018), Year 2025 No Action Alternative, and the Proposed Project / Action Alternative. The NHL consists of a main line that provides service between New Haven and GCT, and three branch lines that provide service to Waterbury, Danbury, and New Canaan and connect to the main line with either direct service or transfer opportunities to the main line. The Branches service territory includes trains that start at stations along the New Canaan, Danbury, or Waterbury branches.

The Outer NHL service territory includes stations between New Haven and Noroton Heights. The Inner NHL service territory includes stations between Stamford and Mt. Vernon East, NY.

Table 1: Train Starts by Service Territory (AM Peak Period)

Service Territory	Current Fall 2018*		No Action Alternative 2025		Proposed Project / Action Alternative 2025		
	GCT	TOTAL	GCT	TOTAL	GCT	PSNY	TOTAL
Branches	9	13	9	13	8	1	13
Outer NHL	21	24	21	24	17	4	24
Inner NHL (CT)	13	13	13	13	12	5	17
Inner NHL (NY)	10	10	10	10	10	2	12
TOTAL	53	60	53	60	47	12	66

Source: Metro-North

Note: 2018 train service starts have not changed substantially by 2020.

The service levels for the Proposed Project / Action Alternative reflects initial service planning efforts (a “proof of concept”). These service levels and related NHL station stops are expected to be refined. As the project planning evolves, nevertheless, these refinements are not expected to have a significant impact on the travel demand forecasts.

2.3 INDUCED DEMAND

This section outlines the “induced” ridership demand potential of the four Bronx commuter rail stations that are part of the PSA project. “Induced” ridership typically consists of riders that would not have made the trip or traveled using the rail mode except for the presence of the new rail station or service. Induced ridership demand has been found to account for up to 5% to 35% of the ridership at new rail stations and rail lines. This is based on surveys of riders typically within one to three years after the opening of new rail service.

The new station(s) can also result in changes in the distribution of travel, such as the origin of workers traveling to a nearby employment center, or the location of destinations or mode used by nearby residents of a station. A new rail station or service can shift these existing trip distribution patterns by making travel faster and more convenient due to the increased accessibility from the new train station. These riders are not diversions of previous rail users or other travel modes in the vicinity of the station. Typically, the changes in commuting patterns resulting from the improved accessibility of a new rail station are not accounted for in the travel demand forecasting models. This is the case with the new Bronx stations, as existing ridership forecasts do not take into account these changes in trip distribution and induced ridership demand.

Elements used in projecting induced demand include examples from other relevant experiences, such as Secaucus Junction station in New Jersey and Yawkey and Ruggles Stations in the Boston area, and census employment data for residents and workers within 1 mile of New Bronx Stations. Together these references helped to identify potential travel markets to and from the new stations. A detailed analysis of how the induced demand was determined can be seen in the Induced Ridership Demand for Bronx Penn Access Stations Tech Memo (Appendix B).

Longitudinal Employer-Household Dynamics (LEHD) data indicate that there is a significant commuter market to and from Bronx areas within the one-mile radius of the proposed new PSA stations. Approximately 15,000 residents in the study area of 1 mile radius around each of the four Bronx stations commute to work places within a half mile of PSNY. Additionally, approximately 1,800 Bronx residents within a one-mile radius of the four Bronx PSA station areas commuted in 2014 to areas in Connecticut and Westchester County near the NHL.

The study area also attracts approximately 1,500 daily workers from these suburban areas that have jobs within one mile of each Bronx station area. Combined, these numbers indicate that potential boardings at the proposed Bronx PSA stations not related to commuting to Manhattan could be equal to 20% of Bronx PSNY area residential commuting workers. This number is significant and has the potential of being even higher after the PSA project is complete. (1,800 reverse commuters plus 1,500 destination commuters compared to these plus 15,000 Bronx commuters to area near PSNY).

Overall 1.92% of Bronx PSA station jobs located within one mile of the stations have commuter origins in Westchester, Fairfield, and New Haven counties along the NHL. Morris Park has the highest orientation, with 2.33% of its jobs originating in suburban NHL station areas. This reflects the type of higher income jobs located in this station area at the educational/medical centers near this station. Over half of the higher income jobs near Bronx PSA stations are located in the Morris Park station area. The number of resident workers and workers commuting to the Bronx stations establish

the baseline of potential ridership that will change as a result of “induced” ridership demand related to the new Bronx stations. Table 2 shows the total induced demand to and from the four New Bronx Stations for 2025 for the AM Peak Period and Average Weekday. This includes both inbound and outbound riders. The variation in ons and offs (i.e., boardings and alightings) reflects service differences and as a result the values are not expected to be equal.

Table 2: 2025 Induced Demand to and from New Bronx Stations (AM Peak Period and Daily)

New Bronx Stations	AM Peak Induced Demand		Daily Induced Demand	
	ONS	OFFS	ONS	OFFS
Co-op City	215	50	369	369
Morris Park	425	400	1,147	1,147
Parkchester/Van Nest	525	80	842	842
Hunts Point	245	120	507	507
TOTAL	1,410	650	2,865	2,865

Source: Metro-North

The total induced ridership demand of 1,410 AM Peak boarding riders represents 49% of the New Bronx stations AM Peak Period outbound boarding riders. The 660 AM Peak Station Deboarding or OFF riders represents 58% of the New Bronx Stations AM Peak Period inbound exiting riders. Overall, the total of 5,730 induced Bronx station riders represents 42% of the Total Daily New Station Bronx riders. For the entire Penn Station Access project, induced ridership represents 19% of total daily ridership.

The induced demand ridership figures and how they were derived are shown in more detail in Appendix B. The induced ridership figures represent ridership that will occur over a 3 to 5 year period as a result of reduced travel time and increase accessibility of the Bronx station to the larger New Haven Line. They represent an “average” assesment of the potential additional ridership that may occur as result of these new stations. The rideship figures do not account for any impact of changes in existing fare policy that may occur between 2020 and the time of project opening. This includes any consideration of options such as Freedom Fare or any other policies that may occur in the future.

3 Travel Demand Forecasts

This section presents the forecast results for the No Action Alternative and the Proposed Project / Action Alternative. For the forecast year of 2025, passenger origin and destinations along the NHL were first projected for future conditions without and then with the proposed project (section 3.1). Inbound and outbound ridership was next calculated for ridership in the year 2025 by groups of stations (station segments) to reflect the level of accuracy of the model in predicting station-specific values (section 3.2).

Expected shifts in mode and terminal station between the No Action Alternative and the Proposed Project / Action Alternative were applied to trains going to PSNY and additional overall Manhattan bound trains on the NHL (section 3.3). It is also expected that a proportion of current riders are forecast to shift from GCT to PSNY as a result of the PSA project, and new riders would also switch to the NHL and commuter rail from other modes (e.g., diversions from auto, subway, and bus). From these changes reductions of vehicle miles traveled was also calculated (Section 3.4).

Lastly, applying elements used from other relevant example experiences, expected induced demand from the project and the new passenger stations in the Bronx was formulated, consisting of riders that would not have made the trip or traveled using the rail mode except for the presence of the new service (section 3.5).

3.1 2025 NHL TRIPS WITH MANHATTAN DESTINATIONS

This sub-section discusses the geographic distribution of PSA trips with Manhattan destinations.

Figure 1 provides a baseline 2025 No Action Alternative for destinations by segmented zones in Manhattan of those NHL riders traveling to GCT. Under this scenario, passengers would not have a direct one-seat ride on the NHL to PSNY. Approximately 25% of riders have destinations on the east side of Manhattan between 42nd to 59th Streets, with nearly another 13% having destinations south of 42nd Street to 23rd Street (east of Fifth Avenue). West of Fifth Avenue, approximately 23% of riders have destinations between 42nd and 59th Streets, while 15% have destinations south of 42nd Street to approximately 23rd Street. Approximately 12% of riders to GCT have destinations in Downtown Manhattan under the 2025 No Action Alternative.

Figure 2 shows the 2025 Manhattan destinations of NHL riders who use either GCT or PSNY under conditions with the Proposed Project. Figure 2 thus shows the combined impact of PSA with GCT on the NHL. This figure can be compared to Figure 1, which represents the No Action Alternative with only GCT available. Overall the comparison shows a minor shift in the percentage of riders with destinations on the East side of Fifth Avenue in Midtown changing by -1.6% and destinations west of Fifth Avenue in Midtown (21st to 59th Street) changing by +1.8%. Locations in the Valley remain constant with the Proposed Project / Action Alternative.

Figure 3 shows GCT Manhattan destinations for all NHL riders under the Proposed Project / Action Alternative. The biggest change is on the West Side of Manhattan in Midtown west of Fifth Avenue. The percentage of GCT riders going between 42nd and 21st Streets on the west side declines by 7.3% with the Proposed Project / Action Alternative. There also is a small decline in the Upper

Valley, with GCT destinations at -1.0% in this area with the Proposed Project / Action Alternative vs. the No Action Alternative. Destinations on the East Side of Fifth Avenue in the Build Case increase by +3.4% on the east side north of 42nd Street, where GCT is located. The Upper West Side north of 42nd Street also has an increase in GCT destination percentage with the Build Case of +2.9%. Other locations show minimal change in GCT destinations.

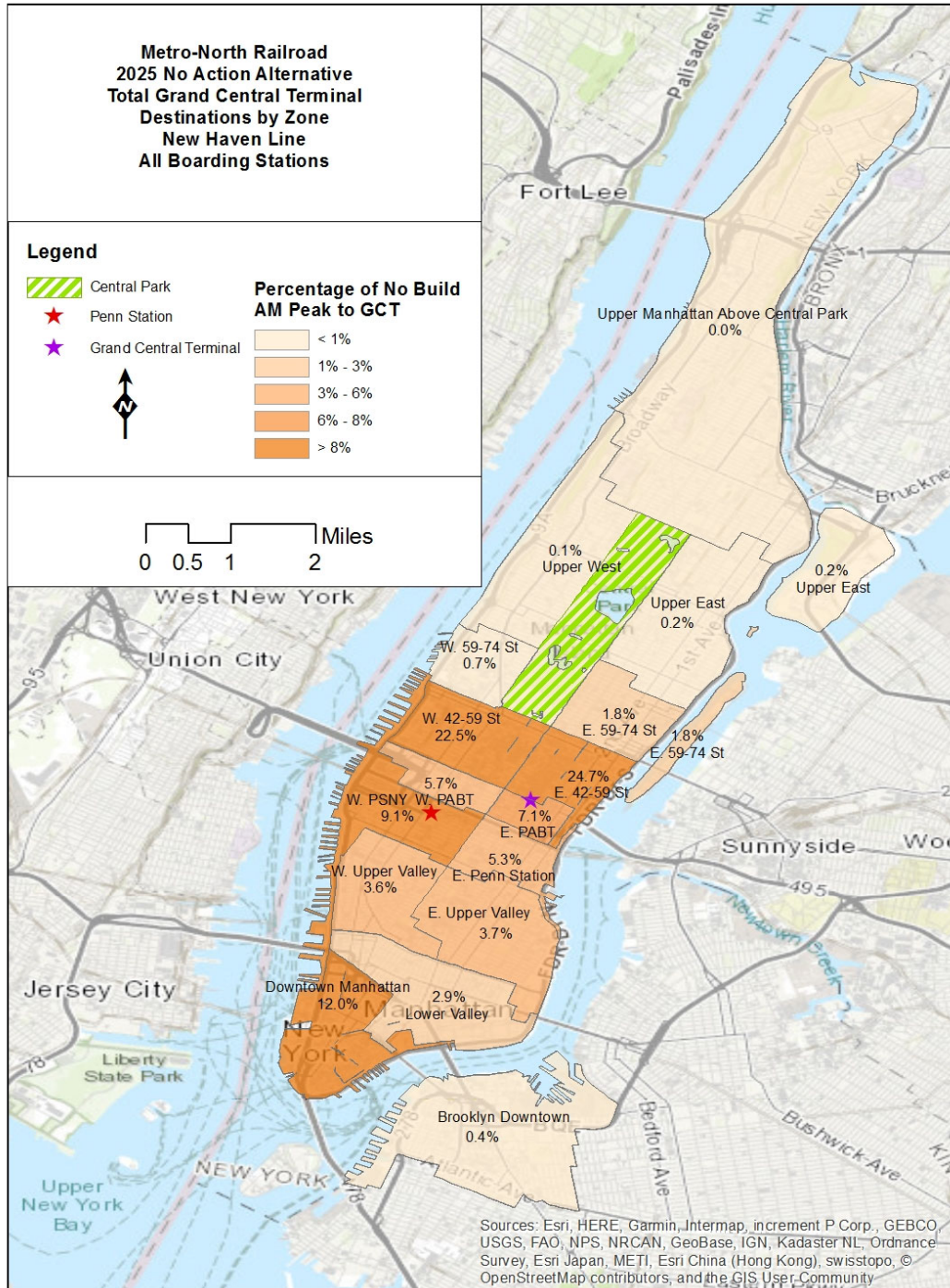
Figure 4 shows the PSA Manhattan destinations for NHL Riders who exit at PSNY in the AM Peak Period. The project exhibits the shift of customers with West Side destinations from GCT to PSNY. The majority (69.6%) of the PSA Manhattan destinations are located between 21st and 42nd Streets west of Fifth Avenue. Another 11% are on the west side of the Upper Valley. In total, 83% of PSA Manhattan Destinations are on the west side of Manhattan in Midtown and the Valley. These riders either walk or take west side subway lines to the final destinations. The west side also includes the Hudson Yards development project. Only 6% of PSNY destinations are on the East Side of Midtown Manhattan. Similar to GCT, PSNY has about 10.3% of its riders with destinations in Lower Manhattan. Overall, the Proposed Project / Action Alternative shows that service to PSNY is more attractive to riders going to destinations west and south of 42nd Street while service to GCT continues to attract riders traveling to destinations north of 42nd Street and on the east side of Manhattan.

Figure 5 shows that a majority of Connecticut (CT) NHL riders have destinations on the west side of Manhattan (west of 5th Avenue). The zone where PSNY is located is the destination of 58% of CT NHL riders. Including the adjacent zone up to the Port Authority Bus Terminal (PABT) which also includes all of the West Side Yards development, about 73% of CT NHL riders have destinations in this location. The West Upper Valley, south to 14th Street adds another 11% of CT NHL riders as a Manhattan destination. Overall, about 86% of CT NHL riders using PSNY have destinations on the west side with walk or short subway access. Another 6% have destinations downtown, using the 1/2/3 or A/C/E trains which are immediately accessible from PSNY. Finally, another 3% of CT NHL riders have destinations on the east side immediately adjacent to PSNY (34th to 23rd streets).

Figure 6 shows that riders that use New York (NY) NHL boarding stations have a similar pattern to those from CT, with 66% of these riders using PSNY having destinations in the zone where PSNY is located or the adjacent area on the west side up to the PABT. Unlike CT, another 4% have destinations on the west side north of 42nd Street to 59th Street. Overall 81% of NY NHL boarding riders using PSNY have destinations on the west side with walk or short subway access. NY originating riders using PSNY have a difference in destinations compared to CT riders. with a greater percentage of NY riders have destinations downtown in Lower Manhattan (12% vs. 6%).

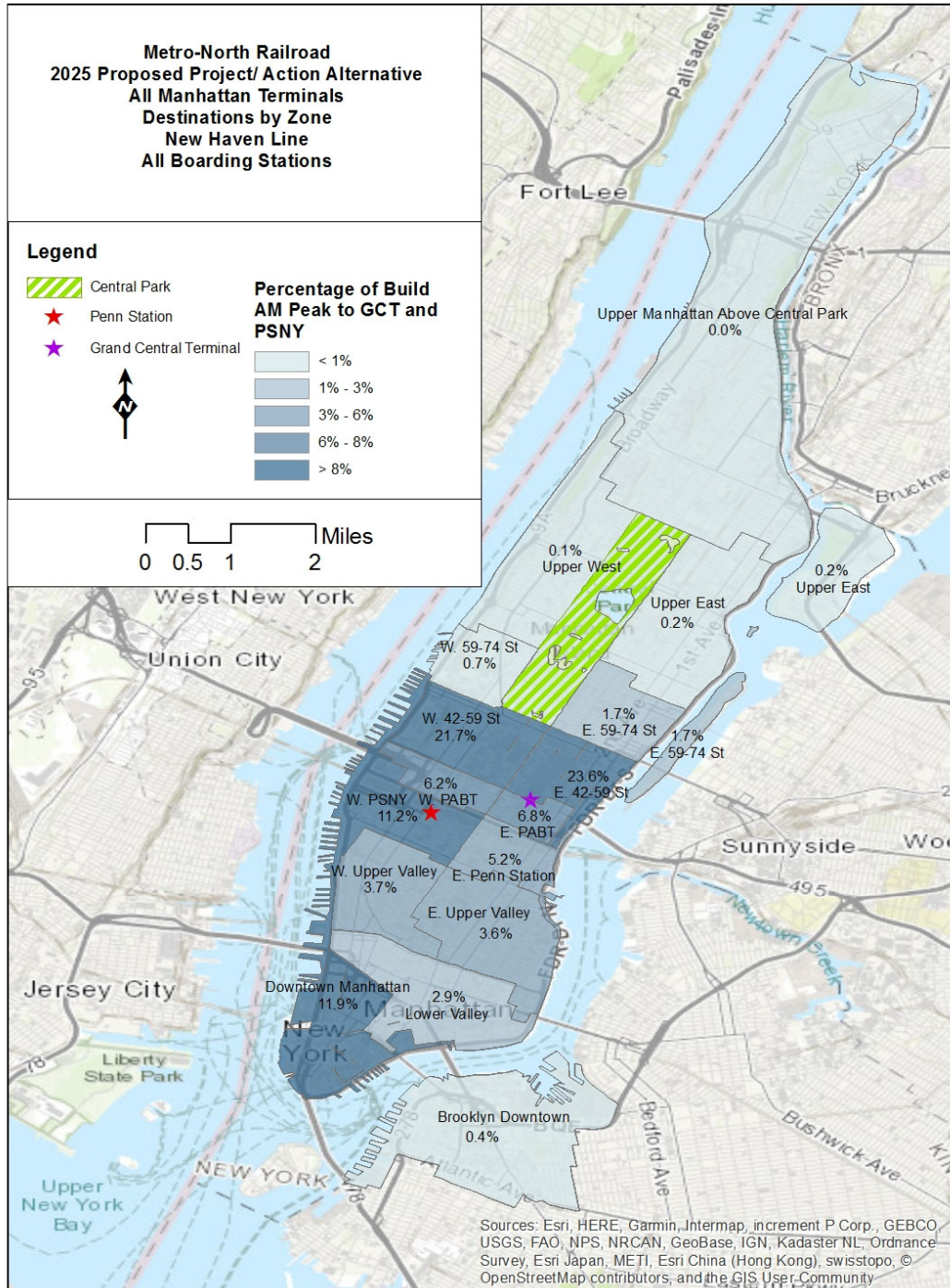
The common destinations all NHL riders using PSNY from both states is the high percentage of riders going to the west side and Lower Manhattan. In addition there are significant riders with destinations adjacent to PSNY, including the new West Side Yard development.

Figure 1: Proposed Project - 2025 No-Build Grand Central Terminal Destinations by Zone – New Haven Line – All Boarding Stations



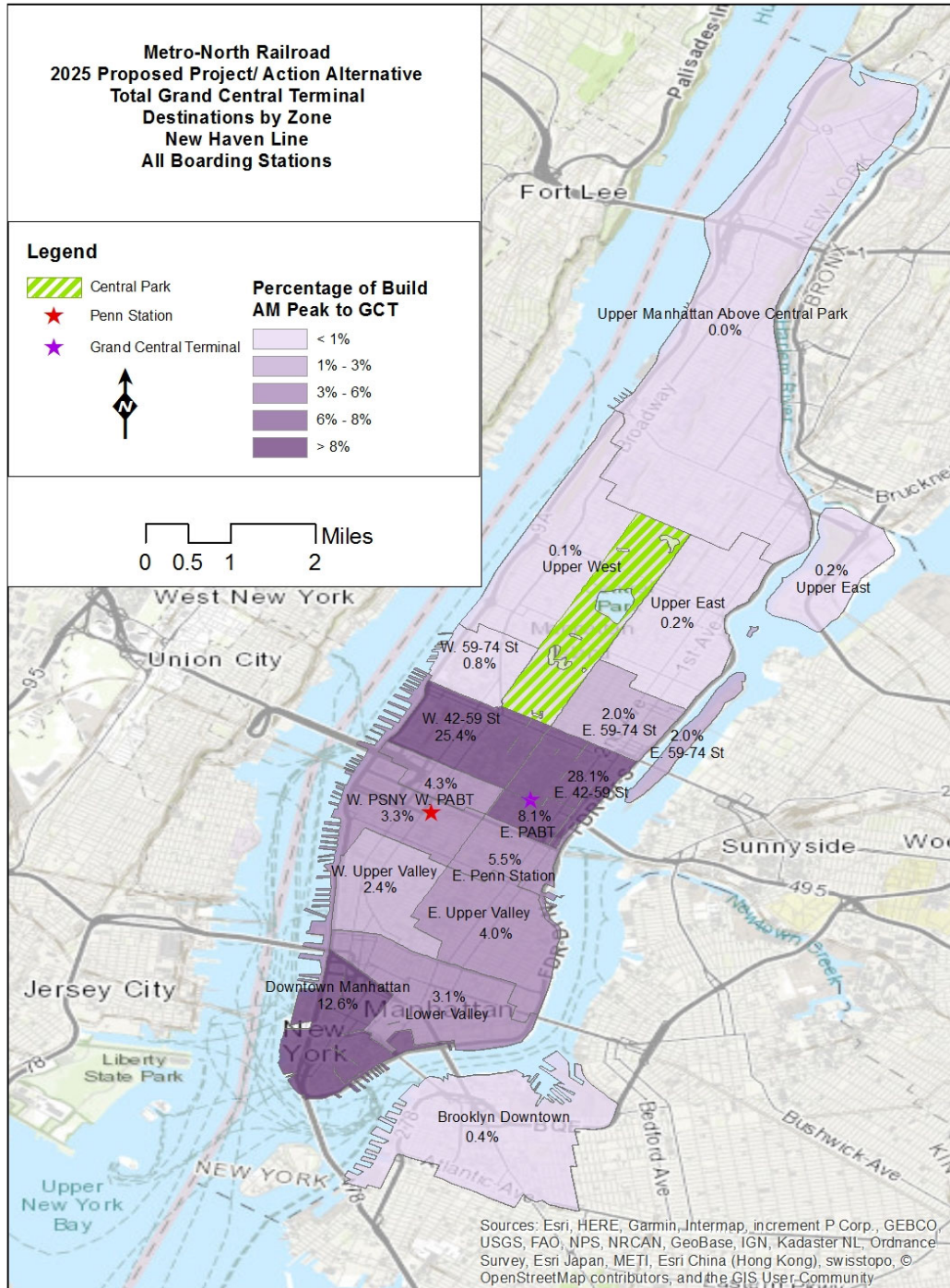
Source: AECOM

Figure 2: Proposed Project – 2025 Build All Manhattan Terminals Destinations by Zone– New Haven Line – All Boarding Stations



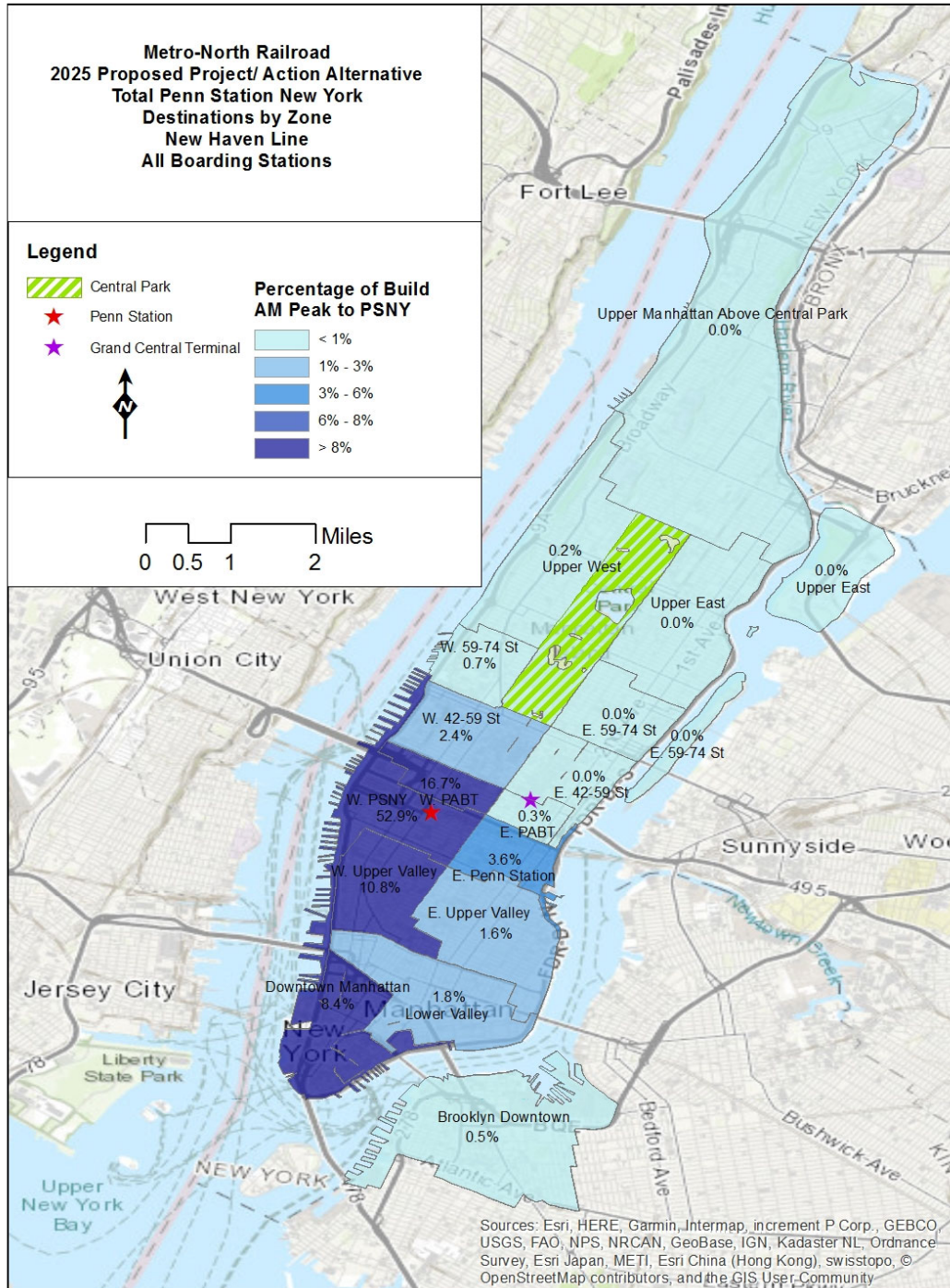
Source: AECOM

Figure 3: Proposed Project - 2025 Build Grand Central Terminal Destinations by Zone – New Haven Line - All Boarding Stations



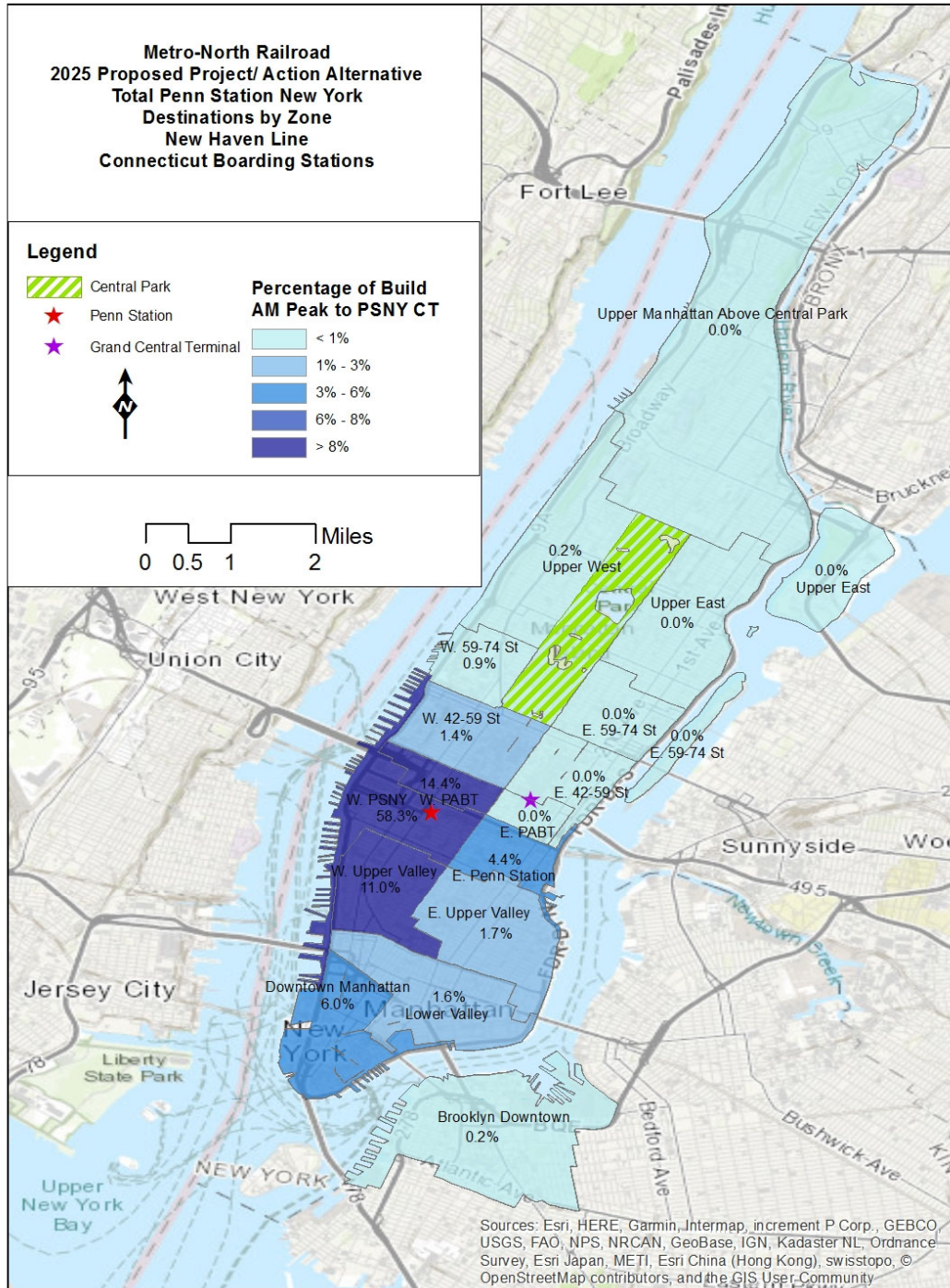
Source: AECOM

Figure 4: Proposed Project - 2025 Penn Station New York Destinations by Zone – New Haven Line – All Boarding Stations



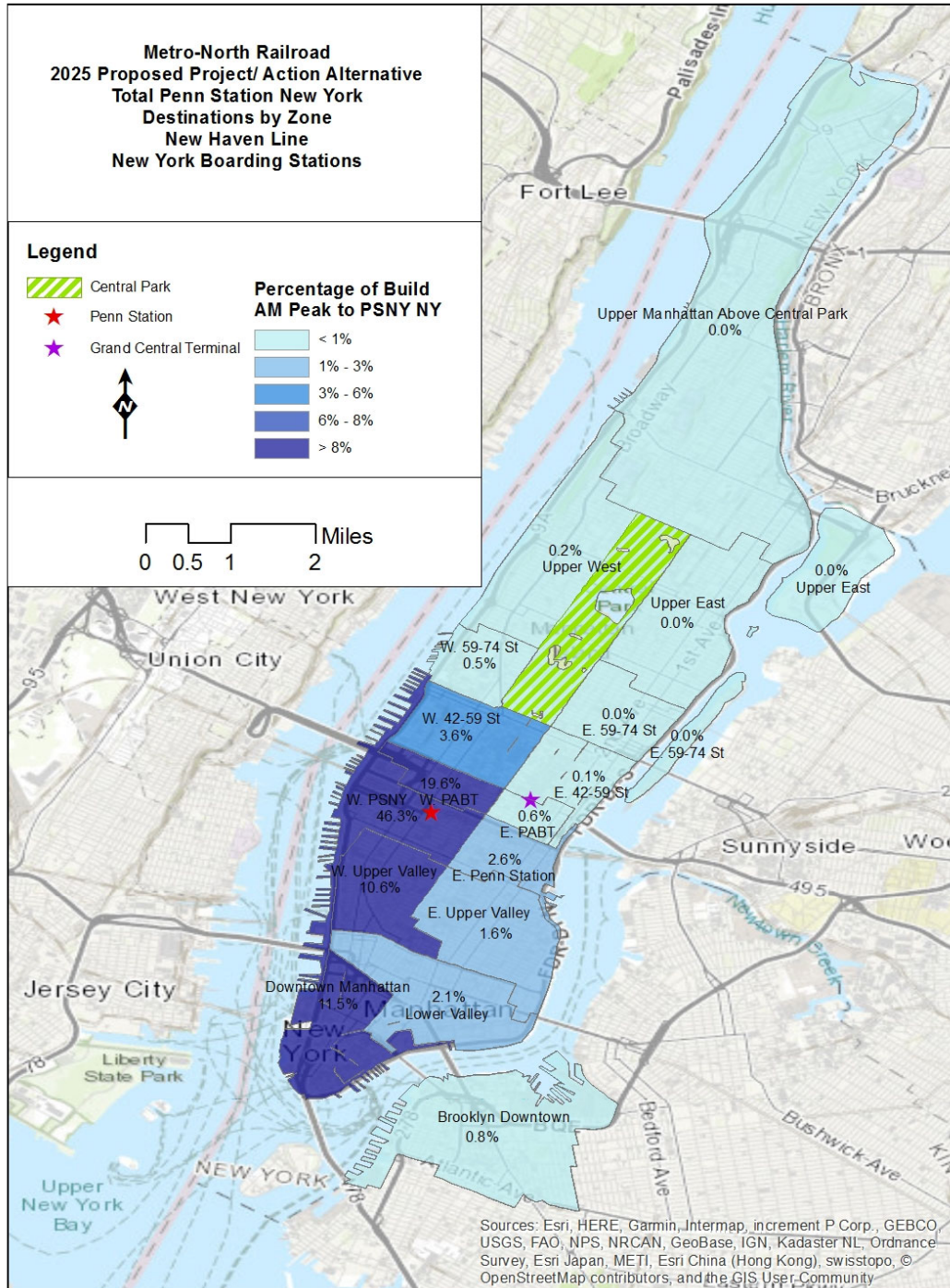
Source: AECOM

Figure 5: Proposed Project – 2025 Penn Station Destinations by Zone – New Haven Line – Connecticut Boarding Stations



Source: AECOM

Figure 6: Proposed Project - 2025 Penn Station Destinations by Zone – New Haven Line – New York Boarding Stations



Source: AECOM

3.2 2025 INBOUND AND OUTBOUND RIDERSHIP

Ridership results for 2025 are summarized by groups of stations (station segments) rather than by individual stations to better reflect the level of accuracy of the model in predicting station-specific values. Key major stations are presented separately, such as Stamford and PSNY, to better highlight their significance. GCT is grouped with 125th Street in order to give a clear understanding of the current Manhattan service on the New Haven Line to be used as a source of comparison with new PSA service to the New Bronx Stations and PSNY. The following station segments are used to present ridership results throughout this document:

- CT Branches (Waterbury, Danbury, and New Canaan): All stations on the branch lines
- New Haven to Stratford: New Haven State Street, New Haven, West Haven, Milford, and Stratford
- Bridgeport to Green's Farm: Bridgeport, Fairfield Metro, Fairfield, Southport, and Green's Farm
- Westport to South Norwalk: Westport, East Norwalk, and South Norwalk
- Rowayton to Noroton Heights: Rowayton, Darien, and Noroton Heights
- Stamford
- Old Greenwich to Greenwich: Old Greenwich, Riverside, Cos Cob, and Greenwich
- Port Chester to New Rochelle: Port Chester, Rye, Harrison, Mamaroneck, Larchmont, and New Rochelle
- South of New Rochelle: Pelham, Mount Vernon East, and Fordham
- New Bronx Stations: Co-Op City, Morris Park, Parkchester-Van Nest, and Hunts Point
- PSNY
- GCT/125th Street: Grand Central Terminal and 125th Street

These segments are further summarized to highlight subtotals for Connecticut (NHL and Branches), New York NHL, New Bronx Stations, New York Terminals¹ (PSNY and GCT/125th Street) and New York. These subtotals are highlighted in bold on the following tables.

Table 3 shows the 2025 AM Peak Period inbound ons (boardings) from NHL station segments by total trips for the No Action Alternative and the Proposed Project / Action Alternative. With the implementation of Penn Station Access, AM Peak inbound ons increase by 2,270 trips or 5% from the No Action. The South of New Rochelle segment shows a decrease in AM Peak Period inbound ons (- 200 trips) where service splits to serve PSNY and GCT in the Proposed Project / Action Alternative.

¹ New York Terminal results are not shown on inbound summaries as there are no inbound boardings.

Table 3: Proposed Project - 2025 Inbound Ons from NHL Station Segments (AM Peak Period)

Station Segments	AM Peak Period Inbound Ons		
	No Action Alternative	Proposed Project/ Action Alternative *	Action Alternative vs. No Action Change
CT Branches (Waterbury, Danbury, New Canaan)	4,700	4,990	290
New Haven to Stratford	3,960	4,000	40
Bridgeport to Green's Farm	6,430	6,380	-50
Westport to So. Norwalk	4,310	4,110	-200
Rowayton to Noroton Heights	2,110	2,200	90
Stamford	5,760	5,540	-220
Old Greenwich to Greenwich	4,040	4,430	390
Connecticut Subtotal	31,310	31,650	340
Port Chester to New Rochelle	11,460	12,650	1,190
South of New Rochelle (Pelham, Mt. Vernon East, Fordham)	2,870	2,670	-200
TOTAL NY New Haven Line	14,330	15,320	990
Co-Op City	0	580	580
Morris Park	0	140	140
Parkchester	0	210	210
Hunts Point	0	10	10
New Bronx Stations	0	940	940
New York State Subtotal	14,330	16,260	1,930
TOTAL New Haven Line	45,640	47,910	+2,270 (+5%)

Source: AECOM

Note: Table displays inbound ons with Fordham and the New York Manhattan Terminals having values of 0

* Represents boarding's of trains to GCT and PSNY

Table 4 shows the Proposed Project / Action Alternative and the No Action Alternative reverse (outbound) AM Peak outbound ons from NHL station segments. With the implementation of PSA, outbound ons in the AM Peak increase by 26% or 2,450, largely attributed to 2,660 AM Peak outbound ons boarding at the New Bronx Stations. The decrease in ridership at GCT/125th Street and in the South of New Rochelle segments reflects a ridership shift of existing riders to PSNY and the New Bronx Stations as well as service changes in this segment.

Table 4: Proposed Project - 2025 Outbound (Reverse) Ons from NHL Station Segments (AM Peak Period)

Station Segments	AM Peak Period Outbound (Reverse) Ons		
	No Action Alternative	Proposed Project / Action Alternative *	Action Alternative vs. No Action Change
CT Branch Lines (Waterbury, Danbury, New Canaan) Subtotal	80	80	0
New Haven to Stratford	530	560	30
Bridgeport to Green's Farm	360	380	20
Westport to South Norwalk	430	450	20
Rowayton to Noroton Heights	140	120	-20
Stamford	330	640	310
Old Greenwich to Greenwich	210	190	-20
Connecticut Subtotal	2,080	2,420	340
Port Chester to New Rochelle	690	860	170
South of New Rochelle (Pelham, Mt. Vernon East, Fordham)	2,150	1,880	-270
TOTAL NY New Haven Line	2,840	2,740	-100
Co Op City	0	500	500
Morris Park	0	610	610
Park Chester/Van Nest	0	840	840
Hunts Point	0	710	710
New Bronx Stations	0	2,660	2,660
New York State Subtotal	2,840	5,400	2,560
New York Manhattan Terminals	4,660	4,210	-450
GCT/125th Street	4,660	3,400	-1,260
Penn Station NY	0	810	810
TOTAL New Haven Line	9,580	12,030	+2,450 (+26%)

Source: AECOM

* Represents boarding's of trains to GCT and PSNY

Table 5 shows the Proposed Project / Action Alternative and the No Action Alternative reverse AM Peak outbound Offs from NHL station segments. This is similar to Table 4, but shows the stations riders use to exit the NHL and indicates the final destinations of reverse riders. This Table 5 is a complement to Table 4. The majority of NHL Off or Destination riders are going to CT. This is shown by the increase of 1,370 AM Peak Off riders in CT. This amounts to a 20% increase of reverse commuters in CT. CT accounts for 56% of the increase in destination AM Reverse Peak Trips from the PSA project. Most of the increase in reverse direction ridership is at Stamford (+1,140) and the Greenwich line segment (+310 riders). Other reverse ridership increases occur in the Port Chester to New Rochelle line segment (+850). The majority of the NY State NHL segment ridership increase is at New Rochelle (about +550 riders).

Table 5: Proposed Project - 2025 Outbound (Reverse) Offs from NHL Station Segments (AM Peak Period)

Station Segments	AM Peak Period Outbound (Reverse) Offs		
	No Action Alternative	Proposed Project / Action Alternative *	Action Alternative vs. No Action Change
CT Branch Lines (Waterbury, Danbury, New Canaan) Subtotal	490	480	-10
New Haven to Stratford	1,450	1,450	0
Bridgeport to Green's Farm	1,050	1,010	-40
Westport to South Norwalk	680	670	-10
Rowayton to Noroton Heights	240	220	-20
Stamford	1,750	2,890	1,140
Old Greenwich to Greenwich	1,130	1,440	310
Connecticut Subtotal	6,790	8,160	1,370
Port Chester to New Rochelle	2,260	3,110	850
South of New Rochelle (Pelham, Mt. Vernon East, Fordham)	530	550	20
TOTAL NY New Haven Line	2,790	3,660	870
Co Op City	0	40	40
Morris Park	0	150	150
Park Chester/Van Nest	0	20	20
Hunts Point	0	<10	<10
New Bronx Stations	0	210	210
New York State Subtotal	2,790	3,870	1,080
New York Manhattan Terminals	0	0	0
GCT/125th Street	0	0	0
Penn Station NY	0	0	0
TOTAL New Haven Line	9,580	12,030	+2,450 (+26%)

Source: AECOM

* Represents induced boarding's of trains to GCT and PSNY

Table 6 shows both inbound and outbound direction AM Peak Period ridership for the No Action Alternative and Proposed Project / Action Alternative. Inbound and outbound ridership is summarized for NHL Connecticut stations, NHL New York stations, New Bronx Stations, and Manhattan Terminals. The outbound ridership has both a greater magnitude of increased ridership with 2,450 more riders compared to inbound increase of 2,270 riders in the Proposed Project / Action Alternative, as well as a higher proportional increase of ridership with 26% compared to 5% inbound increase. The outbound increase in ridership is primarily driven by riders getting on at the New Bronx Stations and reverse commuting to Westchester County and Connecticut, while inbound ridership increases across stations in Connecticut and New York.

Table 6: Proposed Project - 2025 Inbound and Outbound Ons by NHL Segment (AM Peak Period)

NHL Segment	AM Peak Period					
	Inbound Ons			Outbound Ons		
	No Action Alternative	Proposed Project / Action Alternative	Action Alternative vs. No Action Change	No Action Alternative	Proposed Project / Action Alternative	Action Alternative vs. No Action Change
NHL - CT	31,310	31,650	340	2,080	2,420	340
NHL - NY	14,330	15,320	990	2,840	2,740	-100
New Bronx Stations	0	940	940	0	2,660	2,660
Manhattan Terminals	0	0	0	4,660	4,210	-450
NHL - NY+ New Bronx Stations + Manhattan Terminals	14,330	16,260	1,930	7,500	9,610	2,110
TOTAL NHL	45,640	47,910	+2,270 (+5%)	9,580	12,030	+2,450 (+26%)

Source: AECOM

Table 7 shows the 2025 average weekday ridership for the No Action Alternative and the Proposed Project/Action Alternative. Ridership is separated into trips that go to/come from Manhattan and New Bronx stations, and intermediate ridership. The intermediate ridership includes both the South of New Rochelle segment stations (Pelham, Mt. Vernon East, and Fordham) that do not have direct access to PSNY in the Action Alternative and the rest of the line (all segments except the Manhattan Terminals) which have access to PSNY.

Table 7: 2025 Inbound and Outbound Average Weekday Ridership for the Proposed Project and the No Action Alternative

	Average Weekday Ridership			
	No Action Alternative		Proposed Project / Action Alternative	
	GCT/125th		GCT/125 th	PSNY + Bronx
Average Weekday - GCT/PSNY/125th/Bronx	119,540		102,720	29,550
	S. of New Rochelle	Rest of Line	S. of New Rochelle	Rest of Line
Average Weekday - Intermediate	7,640	25,880	6,930	26,880
Average Weekday Total	153,060		166,080	
Average Weekday - PSA	—		30,550	

Source: AECOM

Total Average Weekday PSA ridership includes PSNY and New Bronx Stations (PSNY + Bronx) ridership (29,550) and the incremental intermediate ridership on the Rest of Line (26,880 – 25,880) segment. Daily GCT/125th Street ridership decreases by 16,820, or 14% in the Proposed Project / Action Alternative, with diversions to PSNY and the New Bronx Stations. The South of New Rochelle segment also shows a decrease of 710 daily trips as a result of diversions to new stations (mostly from Fordham) as well as service changes.

3.3 DIVERSIONS AND MODE SHIFTS

This section discusses the shifts in mode and terminal station between the No Action Alternative and the Proposed Project / Action Alternative. With trains going to PSNY and additional overall Manhattan bound trains on the NHL, daily new riders are forecast to switch to commuter rail from the No Action Alternative. Additionally, a proportion of existing riders are forecast to shift from GCT to PSNY in the Action Alternative. New riders are forecast to switch to the NHL and commuter rail from other modes. A majority of new riders are diversions from auto, while there is also a shift from other transit (subway, bus) modes.

Table 8 shows the diversions to PSA service by mode or other service in the No Action Alternative. The average weekday person travel has about 2,850 daily auto person trips switching to commuter rail in the Proposed Project. Non-commuter rail transit has about 3,700 daily person trips diverted to commuter rail in the Proposed Project / Action Alternative. About 5,730 trips are forecast to be induced by the New Bronx Stations in the Proposed Project / Action Alternative and 740 trips are forecast to switch from Harlem or Hudson Line services to new PSA service. The remaining forecast PSA trips are diversions from existing GCT NHL services.

Table 8: Proposed Project – 2025 Added and Diverted Daily Person Trips (Total)

	Daily Person Trips
Daily NHL Person Trips <u>Diverted</u> from NHL GCT Service to PSNY service	17,530
Manhattan Diversions (GCT/125th Street)	16,820
South of New Rochelle (Including Fordham) Diversions	710
Daily <u>Added</u> NHL Person Trips (one-way) (Includes items 1, 2, 3, and 4 below)	13,020
Auto Person Trips diverted to PSNY service ¹	2,850
Other Transit Mode Person Trips diverted to PSNY service ²	3,700
Induced Person Trips ³	5,730
Other MNR Line Person Trips diverted to PSNY service ⁴	740

Source: AECOM

Table 9 shows the 2025 AM Peak Period inbound diversions from GCT/125th Street to PSNY between the Proposed Project / Action Alternative and the No Action Alternative. Approximately 4,990 inbound riders in the AM Peak Period are diversions from GCT/125th Street.

Table 9: Proposed Project - 2025 Inbound Ridership to PSNY and GCT Diversions for NHL Station Segments (AM Peak Period)

Station Segments	AM Peak Period Inbound		
	PSNY	Percent Boarding Riders to PSNY	Diversions from GCT/125 th Street
CT Branches (Waterbury, Danbury, New Canaan)	100	2%	230
New Haven to Stratford	310	8%	-270
Bridgeport to Green's Farm	680	11%	-1,070
Westport to So. Norwalk	530	13%	-580
Rowayton to Noroton Heights	90	4%	10
Stamford	1,060	19%	-1,370
Old Greenwich to Greenwich	650	15%	-380
Connecticut Subtotal	3,420	11%	-3,430
Port Chester to New Rochelle	1,700	13%	-1,360
South of New Rochelle (Pelham, Mt. Vern. East, Fordham)	0	0%	-200
TOTAL NY New Haven Line	1,700	11%	-1,560
Co Op City	580	100%	0
Morris Park	140	100%	0
Park Chester/Van Nest	210	100%	0
Hunts Point	10	100%	0
New Bronx Stations	940	100%	0
New York State Subtotal	2,640	16%	-1,560
TOTAL New Haven Line	6,060	13%	-4,990

Source: AECOM

Table 10 shows the 2025 AM Peak Period outbound diversions from GCT/125th Street to PSNY between the Proposed Project / Action Alternative and the No Action Alternative. Approximately 1,060 reverse/outbound riders in the AM Peak Period are diversions from GCT/125th Street. In addition to the PSNY outbound riders the New Bronx stations have significant outbound ridership with 2,660 AM Peak Period ons seen in Table 4.

Table 10: Proposed Project - 2025 Outbound Ridership from PSNY and Diversions from GCT/125th Street for NHL Station Segments (AM Peak Period)

Station Segments	AM Peak Period		
	PSNY	Percent Alighting Riders from PSNY	Diversion from GCT/125 th St
CT Branch Lines (Waterbury, Danbury, New Canaan) Subtotal	0	0%	-20
New Haven to Stratford	10	1%	-230
Bridgeport to Green's Farm	10	1%	-220
Westport to South Norwalk	10	1%	-100
Rowayton to Noroton Heights	0	0%	-40
Stamford	100	3%	60
Old Greenwich to Greenwich	90	6%	-120
Connecticut Subtotal	220	3%	-670
Port Chester to New Rochelle	390	13%	-340
South of New Rochelle (Pelham, Mt. Vernon East, Fordham)	0	0%	-50
TOTAL NY New Haven Line	390	11%	-390
Co Op City	30	75%	0
Morris Park	150	100%	0
Park Chester/Van Nest	20	100%	0
Hunts Point	<10	100%	0
New Bronx Stations	200	95%	0
New York State Subtotal	590	15%	-390
TOTAL New Haven Line	810	7%	-1,060

Source: AECOM

Table 11: Proposed Project - 2025 Outbound Ridership from New Bronx Stations and Diversions from Fordham for NHL Station Segments (AM Peak Period)

Station Segments	AM Peak Period		
	4 New Bronx Stations	Percent Alighting Riders from New Bronx Stations	Diversion from Fordham
CT Branch Lines (Waterbury, Danbury, New Canaan) Subtotal	0	0%	0
New Haven to Stratford	130	9%	-10
Bridgeport to Green's Farm	80	8%	10
Westport to South Norwalk	40	6%	10
Rowayton to Noroton Heights	10	5%	-10
Stamford	1,070	37%	-90
Old Greenwich to Greenwich	420	29%	-90
Connecticut Subtotal	1,750	21%	-180
Port Chester to New Rochelle	900	29%	-90
South of New Rochelle (Pelham, Mt. Vernon East, Fordham)	0	0%	0
TOTAL NY New Haven Line	900	25%	-90
Co Op City	10	25%	0
Morris Park	0	0%	0
Park Chester/Van Nest	0	0%	0
Hunts Point	0	0%	0
New Bronx Stations	10	5%	0
New York State Subtotal	910	24%	-90
TOTAL New Haven Line	2,660	22%	-270 (-13%)

Source: AECOM

There are 12,030 reverse AM Peak Period MNR riders in the Proposed Project / Action Alternative, of which 2,660 board at the four new Bronx stations, with 270 of these riders being diversions from South of New Rochelle, 13% of the total. South of New Rochelle numbers in Table 11 show net change in the Proposed Project / Action Alternative vs the No Action Alternative South of New Rochelle ridership, which is -270 riders. There are 1,880 South of New Rochelle boarding AM Peak Period NHL reverse riders in the Proposed Project / Action Alternative case compared to No Action Alternative South of New Rochelle riders of 2,150, thus the net change of -270 riders.

For reverse commuters on the New Haven Line in the Proposed Project / Action Alternative, 22% are boarding from new Bronx Stations, 7% from Penn Station, 16% are South of New Rochelle, 28% are from GCT/125 stations, and the balance (27%) are Intermediate.

Table 12 shows the 2025 Daily diversions from GCT/125th to PSNY between the Proposed Project / Action Alternative and the No Action Alternative. The AM Peak ridership for inbound ons to PSNY and GCT/125th and added to the outbound offs from those stations and multiplied by a peak to daily factor of 2.78 to calculate average daily ridership. Of the 30,550 daily PSNY + Bronx riders from Table 7, 18,990 daily trips, or 62%, are to and from PSNY. Daily ridership to and from GCT/125th Street is forecast to decrease by 16,820 in the Proposed Project / Action Alternative.

Table 12: Proposed Project - 2025 Ridership to PSNY and GCT Diversions for New Haven Line Station Segment (Daily)

Station Segment	PSNY	Diversion from GCT/125th
CT Branches (Waterbury, Danbury, New Canaan)	280	-580
New Haven to Stratford	890	1,390
Bridgeport to Green's Farm	1,920	3,590
Westport to South Norwalk	1,500	1,890
Rowayton to Noroton Heights	250	80
Stamford	3,220	3,640
Old Greenwich to Greenwich	2,060	1,390
Connecticut Subtotal	10,120	11,400
Port Chester to New Rochelle	5,810	4,720
South of New Rochelle (Pelham, Mt. Vernon East)	0	700
TOTAL NY New Haven Line	5,810	5,420
Co Op City	1,630	0
Morris Park	780	0
Park Chester/Van Nest	630	0
Hunts Point	20	0
New Bronx Stations	3,060	0
New York State Subtotal	8,870	5,420
TOTAL New Haven Line	18,990	16,820

Source: AECOM

3.4 VMT REDUCTION

The reduction in Vehicle Trips, Vehicle Miles Traveled (VMT), and Vehicle Hours Traveled (VHT) were estimated by taking the Person Trips for Drive Alone (SOV) and Shared Ride (HOV) and drive portion of drive to Commuter Rail and Other Transit, and converting to vehicle trips by dividing by the average vehicle occupancy of 1.1 passengers per vehicle for Drive to Commuter Rail/Transit and for SOV/HOV trips traveling from Connecticut, New Jersey, and non-New York City origins to Connecticut, New Jersey, and non-New York City destinations. An average vehicle occupancy of 1.4 was assumed for SOV/HOV trips with one trip end in New York City and the other trip end in Connecticut, New Jersey, and non-New York City locations. An average vehicle occupancy of 1.8 was assumed for SOV/HOV trips with both trip ends in New York City locations.

The Vehicle Miles Traveled savings were calculated by multiplying the change in vehicle trips between the No Action Alternative and the Proposed Project / Action Alternative and multiplying by the skimmed highway distance for SOV/HOV trips and distance to Park and Rides (PNR) for drive to commuter rail/transit trips. The Vehicle Hours Traveled savings were calculated by multiplying the change in vehicle trips between the No Action Alternative and the Proposed Project / Action Alternative and multiplying by the skimmed highway time for SOV/HOV trips and time to PNR for drive to commuter rail/transit trips.

Table 13 shows the daily change in vehicle trips, VMT, and VHT for 2025. In the Proposed Project / Action Alternative, SOV/HOV vehicle trips decrease by approximately 4,890 trips per day saving an average of 19 miles per trip for 92,680 VMT savings and 0.5 hours per trip for 2,680 VHT savings. Drive to Commuter Rail/ Transit vehicle trips increase by 5,990 trips per day with an average of 1.9 miles per trip for 11,470 VMT increase and average 0.1 hours per trip for a 610 VHT increase. Overall there is a net increase of 1,100 vehicle trips per day for 81,210 VMT savings and 2,070 VHT savings on an average weekday in the Proposed Project / Action Alternative.

These average weekday figures were multiplied by the 298.5 ridership annualization factor to estimate annual reduction in VMT. This totals 24,241,000 of VMT reduction for 2025.

Table 13: Proposed Project - 2025 VMT Reductions - Average Daily Weekday

Trip Purpose	No Action Alternative	Proposed Project / Action Alternative	Change
Vehicle Trips	39,067,190	39,068,290	1,100
SOV/HOV	38,167,670	38,162,780	-4,890
Drive to Commuter Rail/ Transit	899,520	905,510	5,990
Vehicle Miles Traveled	457,996,720	457,915,510	-81,210
SOV/HOV	456,135,140	456,042,460	-92,680
Drive to Commuter Rail/ Transit	1,861,580	1,873,050	11,470
Vehicle Hours Traveled	15,670,320	15,668,250	-2,070
SOV/HOV	15,558,520	15,555,840	-2,680
Drive to Commuter Rail/ Transit	111,800	112,410	610

Source: AECOM

Table 14: Proposed Project - 2025 VMT Change - Average Daily Weekday

Origin/Destination	Manhattan	Bronx	Remainder of NYC	Suburban Westchester	Suburban CT	Other NY	TOTAL
Suburban CT	-7,630	-3,920	-4,310	-1,570	-9,390	-10	-26,830
Suburban Westchester	-15,680	-2,100	-1,760	-770	-1,080	-30	-21,420
Bronx	-3,630	2,380	-1,170	-4,730	-16,150	-60	-23,360
Manhattan	0	-80	0	-700	-500	0	-1,280
Remainder of NYC	0	-850	0	-460	-650	0	-1,960
Other NY	0	-120	0	-10	-50	0	-180
NJ	0	-5,080	0	-1,100	0	0	-6,180
TOTAL	-26,940	-9,770	-7,240	-9,340	-27,820	-100	-81,210

Source: AECOM

Table 14 shows the location of the VMT change from the Proposed Project / Action Alternative by sub-region. Origin subareas are in the leftmost column, destinations of VMT changes are across the top in columns. Thus 15,680 of the PSA Daily VMT reductions are from trips originating in suburban Westchester with a Manhattan destination. These are traditional suburb to city commute trips. Overall, 21,420 of VMT reductions originate in Westchester. 9,340 of the destination of VMT reductions are Suburban Westchester. 9,770 of VMT reductions are based on destinations in the Bronx. Overall 23,360 of VMT reductions are a result of Bronx Originating trips. The other locations shown in the table are Connecticut (Sub CT), Queens, Brooklyn, and Staten Island (Other NYC), and other suburban NY counties such as Putnam, Nassau, Suffolk, and Dutchess (Other NY). NJ is shown because of VMT reductions from reverse trips connecting at Penn Station to the Bronx and Westchester.

4 Summary Findings

Ridership forecast findings and conclusions for the Metro-North PSA Project are summarized below for forecast year 2025:

- Total AM Peak Period Inbound Ridership of 6,060 trips to PSNY and a total of 18,990 Daily trips to/from PSNY in the Proposed Project / Action Alternative. (Table 9 and Table 12).
- The Proposed Project / Action Alternative is forecast to serve 940 inbound and 2,660 outbound AM Peak Period ons from the New Bronx Stations for a total of 3,600 ons. (Table ES-5A).
- With the Proposed Project / Action Alternative, proposed service changes would generate 2,270 new NHL trips in the AM Peak Period inbound direction and a total of 13,020 new NHL trips daily. About 44% of the daily new NHL trips are induced riders. (Table 3, Table 7, and Table 8).
- The Proposed Project / Action Alternative is forecast to shift 4,990 AM Peak Period inbound riders, or 13% of GCT/125th Street riders, to PSNY. On a daily basis, there would be a shift of 16,820 trips (14%) from GCT/125th Street to PSNY and the New Bronx Stations. (Table 9 and Table 12).
- The Proposed Project / Action Alternative is forecast to serve 29,950 new PSNY + Bronx Station daily trips, including 5,730 induced trips. (Table 7 and Table 8)
- The Proposed Project / Action Alternative is forecast to generate 30,550 daily one-way person trips. Approximately 57% (17,530) of those trips are diverted from Metro-North Railroad (MNR) NHL GCT service and 43% (13,020) are new trips (Table 12).

Table 15: Proposed Project - 2025 Daily One-Way Person Trips - Total

Description	2025 Daily One-Way Person Trips
Trips Diverted from NHL GCT Service	17,530
New PSA Trips	13,020
TOTAL	30,550

Source: MTA

- Of the 13,020 new daily one-way person trips, 22% (2,850) are diverted from auto and 44% (5,730) are induced trips and the balance are diverted from other transit (e.g., NYCT bus or subway) or other MNR lines (Table 16).

Table 16: Proposed Project - 2025 Daily One-Way Person Trips – New Trips

Description	2025 Daily One-Way Person Trips
Trips diverted from auto	2,850
Trips diverted from other transit mode	3,700
Induced trips	5,730
Trips diverted from other Metro-North lines	740
TOTAL	13,020

Source: MTA

- The four New Bronx Stations are forecast to add 13,750 daily trips as shown on Table 17.

Table 17: Proposed Project - 2025 Daily Ons and Offs at New Bronx Stations

New Bronx Station	2025 Daily Ons and Offs
Co-Op City	3,460
Morris Park	3,960
Parkchester	3,410
Hunts Point	2,920
TOTAL	13,750

Source: MTA

Appendix A Metro-North Customer Satisfaction Survey

The Metro-North Customer Satisfaction Survey was used to establish trip origins and destinations in Manhattan for riders on the NHL. Questions were added to the 2016 MNR Customer Satisfaction Survey by CTDOT to provide information for PSA travel demand forecasting information. These questions aimed to establish the propensity of the rider to transfer from a direct one-seat train ride. It also established what the minimum time savings would have to be to consider transferring on their trip. Riders who indicated an interest in transferring were also asked how much time would have to be saved to consider shifting from a direct train to one with a transfer. The survey had 2,078 valid responses from NHL riders on this transfer question.

A.1 NEW HAVEN LINE TRIP PATTERNS

Figure A-1 shows the rider destinations for trips to GCT using the NHL from the 2016 Metro-North Customer Satisfaction Survey.

A.2 SURVEY RESULTS – WILLINGNESS TO TRANSFER

From the Customer Satisfaction Survey, 57% of Connecticut riders indicated they prefer a one-seat ride rather than a transfer regardless of time savings, while 31% of Connecticut respondents indicated they would consider transferring for a travel time savings of 15 minutes or greater. For New York riders, 66% said they would prefer a one-seat ride regardless of time saved with a transfer, while 26% of NHL New York respondents indicated they would consider a transfer with a savings of 13 minutes or more.

Appendix B Induced Ridership Demand for Bronx Penn Access Stations Tech Memo

Elements used in projecting induced demand include two recent examples of new stations or enhanced service at existing stations. In the New York metropolitan area, NJ Transit constructed a new Secaucus Junction commuter rail station in 2003. The station is within 5 miles of Penn Station and had a major impact on travel to the station site documented in Census and survey data. It showed an increase in rail trips to employment in the area near the station such that by 2010 there was a 4.4 percent rail share and an increase of 500 daily rail commuters to local employment near this station. The total change in rail share was an increase from 2.7% before Secaucus to 4.4% with Secaucus, with almost 500 reverse rail commuters from NYC.

In the Boston area, Yawkey and Ruggles stations, on the MBTA commuter rail system had a major service enhancements in an area located like the Bronx close to the CBD terminal station. This area was a mixed educational/health care center like Morris Park. These service enhancements had the effect of essentially opening a new station at Yawkey station in 2011. Changes in local destination ridership of an increase of 60 percent was documented at these stations and applied to the Bronx stations. Overall rail share went from 2.4% to 4.9% of total workers in the corridor served by this station, an increase of 255 riders.

Finally, the third example was the experience of reverse commuting on the Harlem Line from the Bronx to White Plains. Existing Metro North data showed a major difference between the amount of Bronx commuting on the Harlem Line with seven Bronx stations having access to rail service to White Plains, compared to only one station on the New Haven Line (Fordham) having access to employment sites such as Stamford and Greenwich. The percent of the White Plains employment that originates in the Bronx was 9.5% in White Plains, compared to only 2% in Greenwich and 0.8% in Stamford. The increased accessibility from the four new Bronx Stations would save between 15 and 45 minutes in travel time to the New Haven Line suburban employment centers. This time savings was estimated to increase the percent of Bronx residents commuting to New Rochelle, Greenwich, and Stamford by a factor of 10% (New Rochelle) to 50% (Greenwich) to 225% (Stamford). This amounts to an increase in the percentage of Bronx commuters to each location by about 1% of the total workers in each of these three cities. Thus Greenwich would have 3% of its workers from the Bronx, and Stamford would have 1.8% with smaller increases to other locations. Overall, the number of Bronx residents commuting to Stamford for example would increase by 750 workers daily as induced demand, 350 to Greenwich, and 230 to New Rochelle. A total of 1,410 new induced workers in the AM Peak Period would commute from the new Bronx Stations.

A similar process was followed for the number of induced riders traveling to the Bronx stations as destinations or job locations. Approximately 810 additional induced riders have Bronx destinations based on a small percentage increase in orientation of Bronx jobs to the NHL origin areas. Morris Park with 450 induced destination riders is the location for the majority (56%) of the induced Bronx destination riders in the AM Peak period. Factors based on peak to daily employment patterns from the US Census were applied to account for induced ridership for the rest of the day. Overall as shown in Table 11, there are a total of 6,660 induced riders, or about 14% of the PSA project ridership.