4C. Transit

This subchapter describes the effects of implementing the CBD Tolling Alternative on transit. Analyses of potential effects on traffic conditions, parking, pedestrians, and bicycle usage are presented in other subchapters of **Chapter 4, "Transportation."** A summary of the affected environment and No Action Alternative conditions and assessment of the environmental consequences of the Project based on the incremental changes in transit ridership between the No Action Alternative and CBD Tolling Alternative is provided below.

4C.1 INTRODUCTION

New York City is home to 8.4 million residents and 4.6 million jobs.[1, 2] The Manhattan CBD is a destination for millions of daily trips and as established in **Subchapter 4A, "Transportation: Regional Transportation Effects and Modeling,"** the vast majority of these trips are made by public transportation. The high-density economic center of Manhattan is connected to the region by transit with a range of modes and service providers, all of which transport millions of workers, residents, and visitors daily to and from the Manhattan CBD. These transit services include local and express subways, commuter and intercity rail, local and express buses, Select Bus Service, intercity buses, ferries, an aerial tramway at Roosevelt Island, and paratransit. **Table 4C-1** lists the 10 busiest subway stations, and **Table 4C-2** lists the 10 busiest lines by ridership entering the Manhattan CBD. (**Figure 4C-1** highlights MTA's service within New York City, and **Section 4C.3** provides an overview of regional transit service and operators.)

Transit is the primary mode of travel to the Manhattan CBD; therefore, the continued investment in transit is critical to mobility and accessibility of the Manhattan CBD and the region.[3] Existing funding sources are insufficient to pay for the transit improvement and modernization projects identified in the MTA 2020-2024 Capital Program and subsequent capital programs that are needed for subway, bus, and commuter rail services. The New York State Legislature adopted the MTA Reform and Traffic Mobility Act to provide stable and reliable funding to repair and revitalize the transit system.

To assess the transit system for potential adverse effects as a result of the Project, future conditions with the No Action Alternative and CBD Tolling Alternative were projected using the Best Practice Model (BPM), a regional travel demand model developed and managed by the New York Metropolitan Transportation Council (NYMTC). As described in more detail in **Subchapter 4A, "Transportation: Regional Transportation Effects and Modeling,"** the BPM provides regional transportation demand (including transit ridership) for the AM peak period defined as between 6:00 a.m. and 10:00 a.m. The modeled change or increment between the No Action Alternative and the CBD Tolling Alternative for projected inbound trips toward the Manhattan CBD provide the primary basis for the analysis presented in this subchapter. **Section 4C.4.2.2** presents a summary of effects across all tolling scenarios and a determination of the representative tolling

1 U.S. Census Bureau. American Community Survey, 2015-2019.
2 U.S. Census Bureau, 2012–2016 Census Transportation Planning Package.
3 **Chapter 1, "Introduction,"** provides additional context on the importance of transit to the Manhattan CBD and the region and the need for transit funding, which the Project provides.

scenario with the highest incremental increases in ridership. Section 4C.2 presents a description of the methodologies used for the assessment of potential adverse effects.

Table 4C-1. Busiest Subway Stations (Annual Total Ridership, 2019)

RANK	STATION/COMPLEX	LINES SERVED	RIDERSHIP
1	Times Sq/42 St/PABT	N, Q, R, W, S; Nos. 1, 2, 3, 7; A, C, E	65,020,294
2	Grand Central – 42 St	S; Nos. 4, 5, 6, 7	45,745,700
3	34 St – Herald Sq	B, D, F, M, N, Q, R, W	39,385,436
4	14 St – Union Sq	L, N, Q, R, W; Nos. 4, 5, 6	32,385,260
5	Fulton St	A, C, J, Z; Nos. 2, 3, 4, 5	27,715,365
6	34 St – Penn Station	Nos. 1, 2, 3	25,967,676
7	34 St – Penn Station	A, C, E	25,631,364
8	59 St – Columbus Circle	A, B, C, D; No. 1	23,040,650
9	Chambers St, WTC/Park Pl/Cortlandt	A, C, E; Nos. 2, 3; R, W	20,820,549
10	Lexington Av-53 St/51 St	E, M; No. 6	18,957,465

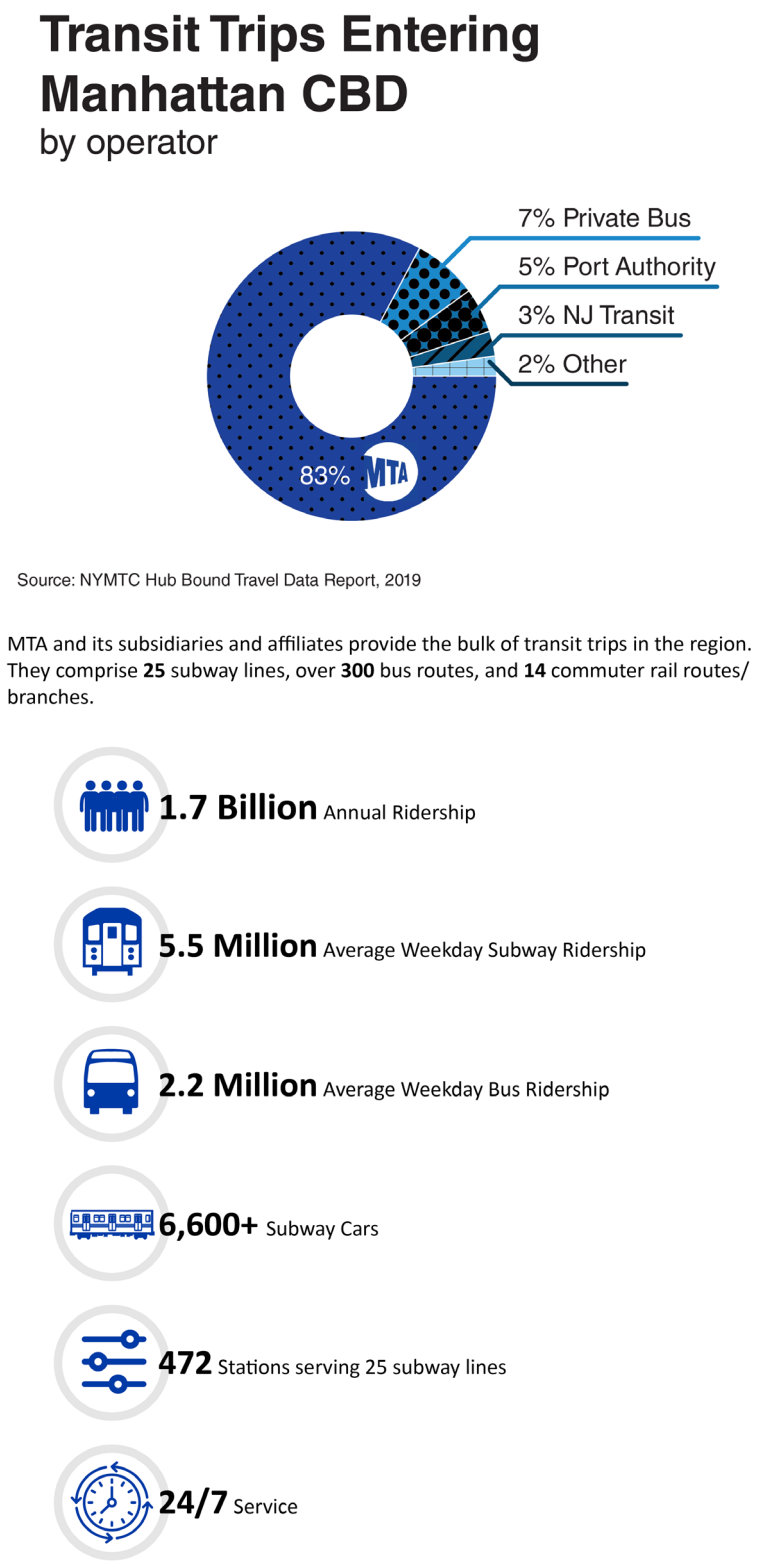
Source: MTA
Note: Data is from 2019, the last full year since the onset of the COVID-19 pandemic. Station ridership is the annual total ridership for 2019; PABT = Port Authority Bus Terminal.

Table 4C-2. Busiest Subway Lines at the Entrance to the Manhattan CBD (2019, AM Peak Period)

RANK	SUBWAY LINE	RIDERSHIP	NO. PEAK-PERIOD SUBWAY TRAINS
1	B, D, N, Q Local	119,435	162
2	Broadway/Seventh Av Express	89,330	125
3	E/M (Queens)	87,258	139
4	Eighth Av Express	84,317	130
5	No. 7 (Queens)	81,066	176
6	N, Q, R (Queens)	67,047	78
7	L	66,760	62
8	Lexington Av Express	63,486	80
9	A, C Local	62,937	65
10	F	48,069	86

Source: WSP, Best Practice Model 2021
Note: Data is from 2019, the last full year since the onset of the COVID-19 pandemic. Ten busiest subway lines are listed based on cordon ridership total per subway line in the AM peak period (6:00 a.m. to 10:00 a.m.).

Figure 4C-1. New York City Transit System Highlights



While the BPM provides a regionwide basis to estimate demand by all modes of travel over time and from changes to the transportation network, Section 4C.3 describes existing transit service as documented in NYMTC's *Hub Bound Travel Data Report 2019*, which is the most comprehensive and route-specific data source to describe travel to the Manhattan CBD. Like the BPM used for this EA, the *Hub Bound Travel Data Report 2019* baseline was developed prior to the COVID-19 pandemic, so it represents a reasonable estimate of the No Action Alternative in 2023 as travel demand returns to pre-COVID-19 pandemic levels. However, because the *Hub Bound Travel Data Report 2019* is not directly comparable to the BPM results for the No Action Alternative, this subchapter's analyses of potential effects are based on the BPM results for the Action Alternative compared with BPM results for the No Action Alternative.

Section 4C.4 assesses the incremental change between the No Action Alternative and the CBD Tolling Alternative in 2023.[4] The BPM results for the No Action Alternative were used as the baseline for this analysis because they reflect transit ridership prior to the COVID-19 pandemic that is now beginning to rebuild but is anticipated to remain below the levels modeled in the BPM.

4C.1.1 Traveling To and Within the Manhattan CBD

Nearly 3.9 million commuters enter the Manhattan CBD each day, across a variety of modes including numerous transit operators that are described in Section 4C.3.[4] With a long development history that pre-dates the automobile, a multitude of transit options are available. Transit accounts for 75.8 percent of daily trips into the Manhattan CBD (not including walk or bike trips); subway alone accounts for 58 percent of trips.[5] Except for one census tract in Breezy Point, Queens, every other census tract in New York City is within a half mile of at least one transit service. The transit system serving the region and the Manhattan CBD is described in detail in Chapter 4, Section 4.2 (Transit Access to the Manhattan CBD), and it includes subways (MTA), Port Authority Trans-Hudson (PATH), commuter rail, buses, ferries, and tram.

For travel within the Manhattan CBD, there are numerous options other than private automobiles. Indeed, 80 percent of Manhattan CBD residents do not own or have ready access to a vehicle.[6] As noted above, numerous subway and bus routes serve the Manhattan CBD. There is a network of bicycle lanes and a widely available bike-share program, and the Manhattan CBD is very walkable.

Most businesses do not offer on-site, free parking, and curbside parking is limited. Driving from place to place within the Manhattan CBD is not typical except for commercial deliveries. Taxis and for-hire vehicles (FHVs, a category that includes app-based services) provide point-to-point service within the Manhattan CBD and are convenient for trips that would otherwise involve multiple transit routes and modes or a long walk (i.e., crosstown trips between the east and west sides of Manhattan). However, even short taxi or FHVs trips may be costly. Therefore, many people make their longer local trips within the

4 The BPM's long-range 2045 analysis year assessment includes MTA Capital Program projects and projects programmed in the NYMTC Transportation Improvement Program. In light of the scale of those projects relative to line-haul capacity and station configurations, detailed analysis is not provided for the 2045 analysis year. Instead, an overview of incremental change (systemwide boardings) at the 2045 horizon year is provided.

5 New York Metropolitan Transportation Council, *Hub Bound Travel Data Report 2019.*

6 This data is from the CTPP data product based on the 2012–2016 ACS. The CTPP provides custom tables describing residence, workplace, and trips from home to work. The U.S. Census Bureau has not updated the CTPP to reflect more recent American Community Survey data.

Manhattan CBD by subway or bus, and many others travel by bicycle. Walking is the typical choice for shorter trips or even longer trips that involve multiple transit modes or transfers.

4C.2 METHODOLOGY AND ASSUMPTIONS

Information presented in the NYMTC *Hub Bound Travel Data Report 2019*, which summarizes weekday trips entering and exiting the Manhattan CBD by all modes, was used to describe the affected environment. Data for that report was collected in fall 2019 and include full-day and hourly trips. This year is assessed as the final full year before the onset of the COVID-19 pandemic.[7]

The analysis presented compares the forecast difference (or "incremental change") in transit ridership that would occur between the CBD Tolling Alternative and the No Action Alternative. Information on projected ridership for the No Action Alternative and CBD Tolling Alternative was based on the results of the regional transportation modeling conducted for the Project using the BPM.[8] **Subchapter 4A, "Transportation: Regional Transportation Effects and Modeling,"** provides more information on the modeling process and corresponding model results. The analysis in this subchapter considers effects on transit line-haul capacity, which is the capacity of a transit mode at its peak ridership point, and on specific transit stations. These assessments are consistent with the methodologies outlined in the *City Environmental Quality Review* (*CEQR) Technical Manual*. The *CEQR Technical Manual* recommends a tiered approach in evaluating a project's effects on transit ridership.

4C.2.1 Application of the New York City Environmental Quality Review for Assessment of Transit Effects

New York City agencies use the CEQR process to determine what effect, if any, a discretionary action they approve may have on the environment. The first version of the *CEQR Technical Manual* was published in 1993 and has undergone numerous updates over the years, with the latest edition released at the end of 2021. The *CEQR Technical Manual* discusses methodologies that may be used to analyze specific impact categories. The methodologies have been developed by the expert staffs of various city agencies, working with consultants. CEQR is New York City's process for implementing New York State's Environmental Quality Review Act. It considers the unique characteristics of New York City and establishes evaluation criteria that are suitable for assessing environmental effects in New York City. Most New York City-based NEPA reviews use the available state and local guidance appropriate to evaluate the potential for adverse effects. Since SEQRA has no impact determination criteria for transit, the guidance provided in the *CEQR Technical Manual* provides a means of appropriately examining and disclosing these effects in a dense urban setting.

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7 The study of transportation conditions for purposes of environmental review is normally conducted using stabilized baselines of typical ridership and usage conditions. Although normalcy is slowly being restored, COVID-19 effects on the regional transit system still persist and are expected to remain for some time, likely well into 2024, after the planned implementation of the Project (based on McKinsey analysis for MTA). As such, only the pre-COVID-19 environment can now be considered a valid baseline for study. MTA 2021 Budget and 2021–2024 Financial Plan Adoption Materials. MTA Finance Committee/MTA Board. December 16, 2020. https://new.mta.info/document/25291.

8 BPM assumes public transit fares remain consistent with consumer price index. Due to the importance of transit in the region, ridership is relatively inelastic to fare increases. MTA historical data show real fares (adjusted for inflation) have decreased over time.

4C.2.1.1 USE OF CEQR THRESHOLDS TO TARGET TRANSIT ANALYSES

Based on operating experience from various New York City agencies and the results of extensive numbers of impact assessments conducted on transit facilities, CEQR guidance establishes assessment thresholds whereby detailed analyses are recommended for locations or transit lines where incremental trip generation thresholds are exceeded; if the applicable threshold is not exceeded, no adverse effects are anticipated. The methodologies stipulated in the 2020 *CEQR Technical Manual* are described below.

The methodologies to evaluate line-haul capacity include the following:

- For subways and commuter rail:
  - An increase in ridership on a single subway line that is fewer than 200 new passengers at the maximum load point in the peak hour in a single direction of travel does not have the potential to result in adverse effects.
  - A quantitative analysis of effects on line-haul capacity was performed for any transit services for which the BPM results indicated that the CBD Tolling Alternative would add more new passengers than those thresholds.
  - The next step is to evaluate the number of incremental passengers per train and per train car.
  - If a line remains under its guideline capacity in the future with the CBD Tolling Alternative implemented, the corresponding CBD Tolling Alternative-induced ridership increases would not be considered an adverse effect.
  - If a line is forecasted to operate above guideline capacity and the CBD Tolling Alternative is expected to yield five or more incremental passengers per car, then the ridership increase would constitute an adverse effect.
- For buses:
  - An increase in ridership that is fewer than 50 passengers per hour in a single direction of travel for a bus route does not have the potential to result in adverse effects because such an increase would not be considered perceptible with the level of bus service provided.
  - If the threshold is exceeded, the next step is to evaluate the number of incremental passengers per trip and the volume-to-capacity (v/c) ratio for that bus route.
  - A v/c ratio under 1.00 would not be considered an adverse effect.

The methodologies to evaluate capacity of stations include the following:

- An increase in ridership at a subway station or station complex that is fewer than 200 new passengers in the peak hour does not have the potential to result in adverse effects.
- If a project would result in the addition of 200 or more new passengers at a station in the peak hour (excluding cross-platform transfers), then further analyses could be warranted to assess the potential for adverse effects on station elements such as stairs, escalators, fare collection areas, etc.
- If a station would experience an increase of fewer than 200 peak-hour passengers, further analysis is typically not warranted.

Due to operating characteristics similar to the subway, including hours of operation, headways, boardings, standing capacity, and for consistency, PATH capacity and stations were both evaluated using CEQR criteria. In coordination with Metro-North Railroad (Metro-North) and the LIRR, CEQR methodologies were used to assess ridership of commuter rail lines and stations. This analysis recognizes that five additional passengers within a train car in its most crowded point would be noticeable. Similarly, analyses of stations for the New Jersey Transit Corporation (NJ TRANSIT) and PATH were performed using CEQR guidelines for consistency and because NJ TRANSIT and the Port Authority of New York and New Jersey (PANYNJ) do not have an alternative guideline. The CEQR analysis guidelines were also evaluated for NJ TRANSIT and other suburban buses that enter the Manhattan CBD.

The line haul and station analysis primarily considers the AM peak period based on concentration of ridership. For station element analyses, potential effects in the PM peak hour were also considered to account for differences in circulation and flow within the stations. The BPM only provides forecast trip increments for the four-hour AM peak period, the incremental AM and PM peak-hour trips were estimated, in coordination with New York City Transit (NYCT), by applying reasonable factors to the BPM results.

For any station exceeding the 200-passenger increment threshold, an additional assessment of station characteristics was undertaken to determine if a qualitative assessment would suffice to conclude that the CBD Tolling Alternative would not have potential adverse effects or if more quantitative analyses were warranted. **Appendix 4C-5, "Transportation: Supporting Documentation for Transit Analyses"** provides more details on the qualitative and quantitative analysis of transit stations, which were developed in consultation with NYCT.

4C.3 AFFECTED ENVIRONMENT

4C.3.1 Regional Transit Environment

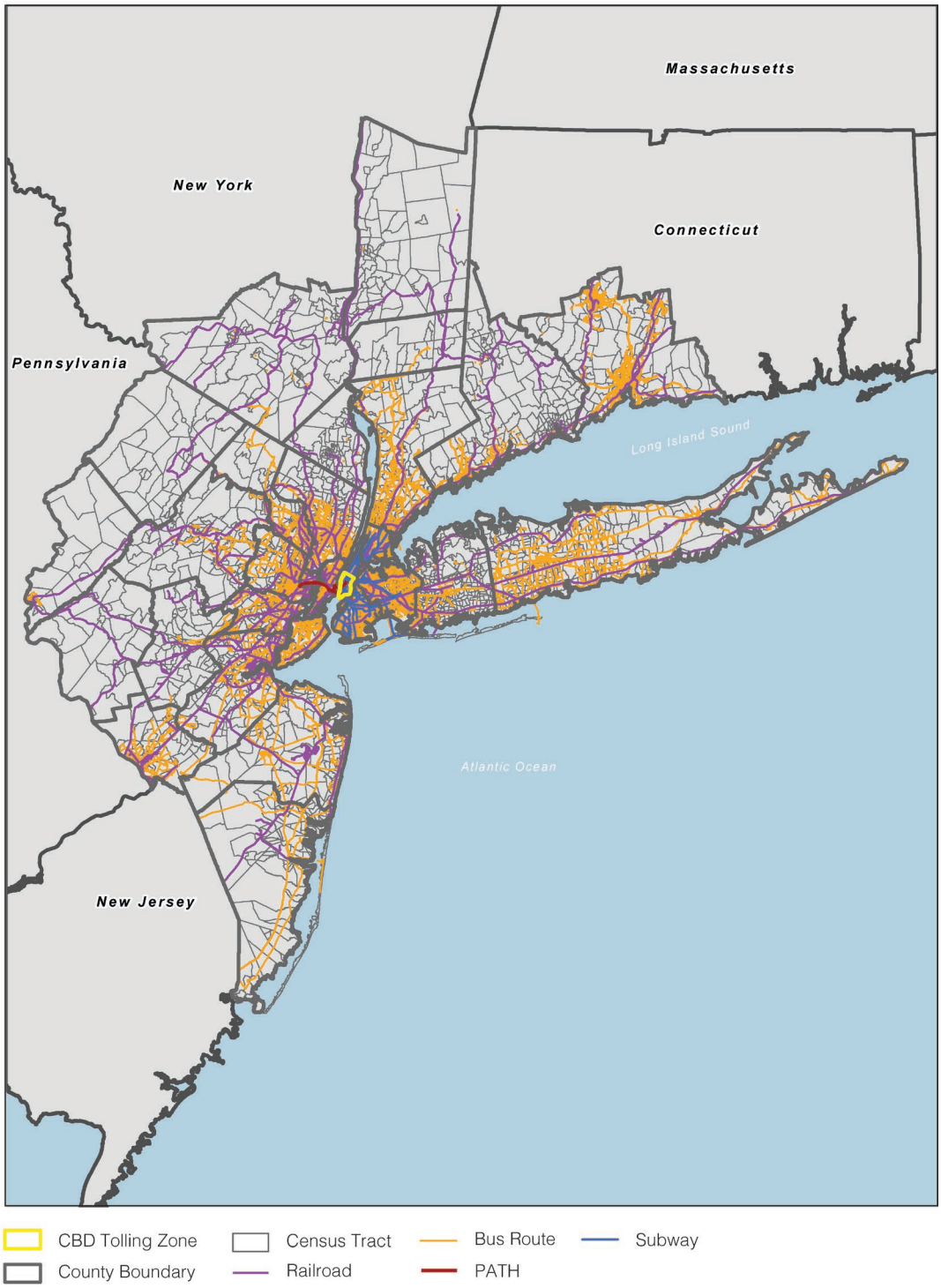
The 28-county study area is rich with transit service (**Figure 4C-2**). While **Section 4C.3.2** focuses on transit options to and from the Manhattan CBD, additional transit options exist throughout the study area. The following is an overview of the regional transit environment.

4C.3.1.1 CONNECTICUT

Much of Connecticut's commuter rail network in Fairfield and New Haven Counties is focused on hub-bound travel; however, the reverse-commute market from New York City to Fairfield County is significant, along with intrastate travel throughout the Metro-North New Haven Line. Branch lines to New Canaan, Danbury, and Waterbury provide additional connections along with the CTrail Hartford Line from New Haven to Hartford.

Local bus services are provided by several operators within (and between) Fairfield and New Haven Counties in Connecticut. Numerous routes connect communities within Connecticut, with concentrations of service in urban areas such as Stamford, Norwalk, Bridgeport, New Haven, and Waterbury. Bus markets between these communities are often distinct from rail markets, particularly where rail branch line services are less frequent or less favorable to intrastate travel.

Figure 4C-2. Transit Services in the 28-County Regional Study Area



Sources: Environmental Services Research Institute (ESRI) 2020, NYC Open Data, MTA, NYSDOT 2021, NJ Geographic Information Network Open Data, NJ TRANSIT 2021, Westchester County, CT Transit 2021.

Note*[s]*:

[1.] Map reflects publicly available datasets only. Additional transit services are available in Nassau, Rockland, and other counties.

[2. For an audio description, please go to the following link: https://www.youtube.com/watch?v=3laoEmd0a6w&list=PLZHkn788ZQJPEY5zv-dr2gzkzMQFMgb_2&index=1.]

4C.3.1.2 NEW JERSEY

Commuter rail services in northern New Jersey largely focus on New York-bound travel; however, intrastate ridership is significant and serves a variety of urban areas and activity centers including Newark, Hoboken, Trenton, and Metropark, among others. The NJ TRANSIT rail network is heavily integrated with local and regional bus networks, light rail, PATH, and ferries, supporting reverse-commute activity from New York City as well.

Local and regional bus service is prevalent throughout northern New Jersey with concentrations in major urban areas such as Hudson County and New Jersey's largest cities, including Newark, Paterson, Jersey City, and Elizabeth. NJ TRANSIT operates most local bus service, complemented by some contract and private carrier routes, along with county and municipal operations, including paratransit, senior, and human services transportation. Private jitney services are also prevalent in Hudson, Bergen, and Passaic Counties, serving both local and interstate customers.

4C.3.1.3 NEW YORK

Commuter rail in Nassau, Suffolk, Rockland, Orange, Dutchess, Putnam, and Westchester Counties is largely focused on travel to New York City. Each east-of-Hudson line is used for intercounty and intracounty travel and for reverse-commute travel from New York City to major employment centers such as White Plains and Stamford, Connecticut.

Extensive local bus networks exist in New York counties adjacent to New York City, notably the Bee-Line and Nassau Inter-County Express (NICE) bus networks in Westchester and Nassau Counties, respectively. Bus transit is also prevalent throughout the region in counties such as Suffolk, Dutchess, Putnam, Orange, and Rockland.

Bee-Line bus service focuses on the suburban and urban portions of southern Westchester County, with hubs in White Plains, Yonkers, Mount Vernon, and New Rochelle. Bee-Line routes connect a wide array of communities and offer multimodal connections to commuter rail, subway, and regional bus services.

Nassau County buses connect communities and activity centers with hubs including (but not limited to) Hempstead, Great Neck, Mineola, and Hicksville. Many hubs include intermodal connections at commuter rail stations, while some routes also serve the Jamaica hub in Queens. Connections are also available to Suffolk County buses in Hicksville. Other New York county bus systems are smaller in scale but offer similar functionality.

While many routes provide multimodal connections at commuter rail stations (and some subway stations), a significant focus of these networks is intracounty travel. Each bus system offers opportunities to transfer to New York City-bound transit or travel within the counties between activity and population centers.

4C.3.1.4 NEW YORK CITY

As previously stated, a multitude of transit options exist within New York City, though the New York City subway is the primary commute option. There are almost three times as many subway riders as bus riders according to pre-COVID-19 pandemic data (approximately 5.5 million average weekday subway riders versus 2.2 million average weekday bus riders).

As the most convenient and affordable means of travel for most New Yorkers, commuters are unlikely to change modes if the subway or station they regularly use is crowded periodically. They may need to wait for the next train, which is typically 5 to 15 minutes away. Moreover, the availability of express and local services throughout the system provides duplicity of service along lines into the Manhattan CBD such that additional capacity is available, especially during peak periods.

4C.3.2 Summary of Transit Service by Provider

4C.3.2.1 DESCRIPTION OF TRANSIT OPERATORS AND SERVICES

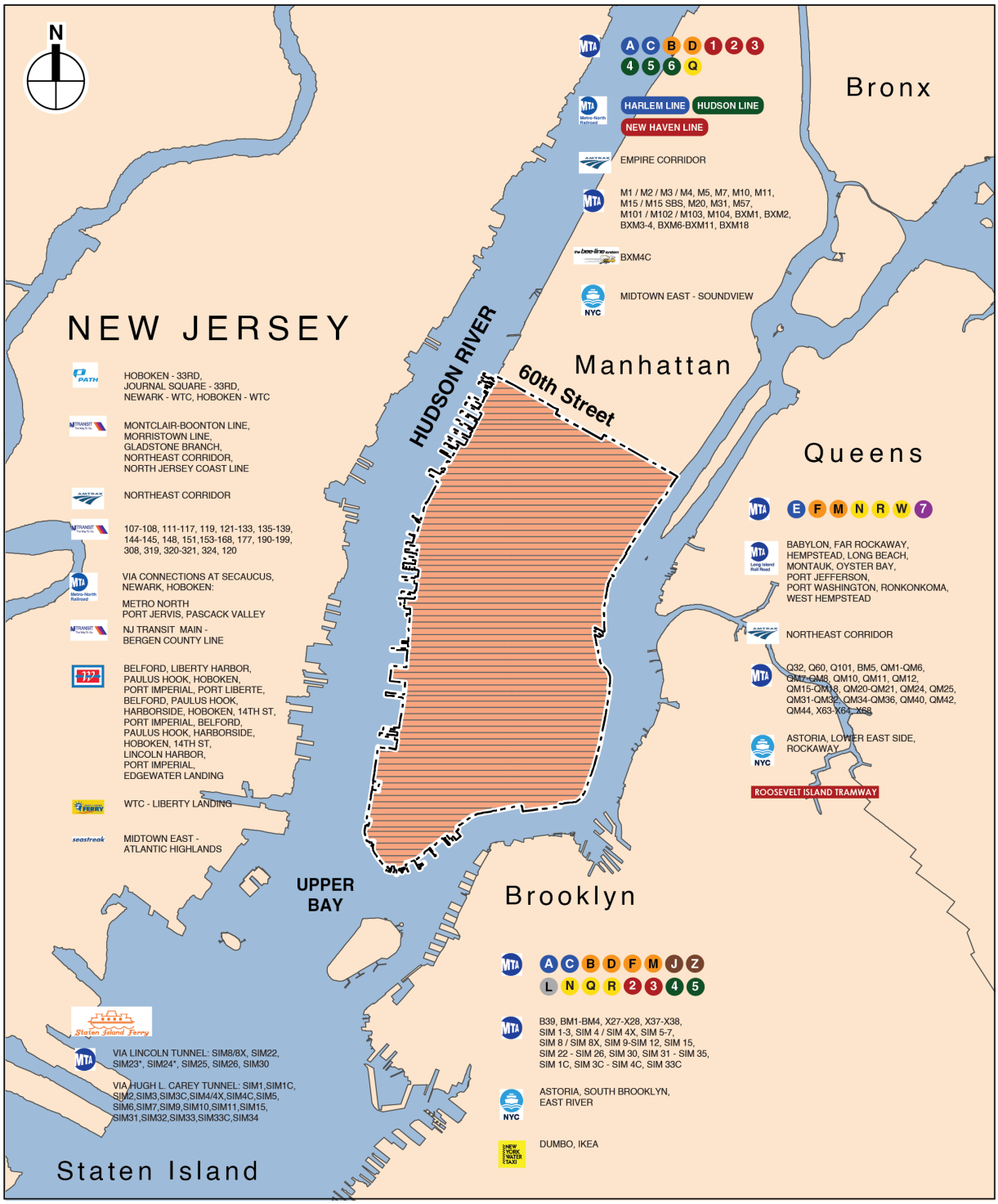
The transit modes and services available to the Manhattan CBD are illustrated on **Figure 4C-3**. The transit system serving the region and the Manhattan CBD is described in detail in Chapter 4, Section 4.2 (Transit Access to the Manhattan CBD), and it includes subways (MTA), PATH, commuter rail, buses, ferries, and tram.

Each of the operators highlighted within **Figure 4C-3** is listed or described below. Consistent with *Hub Bound Travel Data Report 2019* data, which serve as the basis for existing conditions, the following service level estimates reference 2019 data to reflect pre-COVID-19 pandemic conditions:

- **MTA:** MTA and its subsidiaries and affiliates—LIRR, Metro-North, NYCT, and MTA Bus—provide the bulk of transit trips to the Manhattan CBD. The New York City subway system is the single largest transit provider.
  - **MTA subway.** The New York City subway is the most widely used transit mode for access to the Manhattan CBD by residents of New York City.[9] There are 25 individual subway routes that cross into the Manhattan CBD, carrying about 1.35 million AM peak-period riders in and out of the Manhattan CBD on a typical weekday.

[9] The subway does not provide access to the Manhattan CBD from Staten Island. The Staten Island Railway (**Figure 4C-3**) provides rapid-transit within the island.

Figure 4C-3. Transit Routes to/from the Manhattan CBD (2019)



Notes: Private bus operators connect commuters to various locations within the Manhattan CBD; those routes are not displayed here.
* Operated by Academy Bus

Manhattan CBD (Excluding West Side Highway/Route 9A and FDR Drive)

Transit by Sector

Source: NYMTC *Hub Bound Travel Data Report 2019*

- **MTA buses.** NYCT and MTA Bus[10] operate an array of local and express buses and Select Bus Service within New York City (Bus maps for each borough are available in **Appendix 4C-1** and at https://new.mta.info/maps). NYCT operates 234 local, 73 express, and 20 Select Bus Service routes, while MTA Bus operates another 90 express, 44 local, and 3 Select Bus Service routes. From the public's perspective, the two operators are nearly indistinguishable. Therefore, this subchapter refers to the combined services as "MTA buses." MTA buses provide local services into and out of the Manhattan CBD largely at 60th Street as well as local and express bus services from outer boroughs. Local service across the 60th Street boundary consists predominantly of Manhattan-based local services running north/south, serving the Upper East Side, Upper West Side, Harlem, Washington Heights, and Inwood. Local services are also provided to and from Queens via the Ed Koch Queensboro Bridge and to and from Brooklyn via the Williamsburg Bridge. Express bus routes connect the Manhattan CBD with the Bronx, Brooklyn, Queens, and Staten Island. These express bus routes tend to serve areas with fewer or no direct subway connections to the Manhattan CBD. MTA buses carry about 42,245 passengers across the boundary of the Manhattan CBD during the AM peak period on a typical weekday.[11]
- **MTA commuter rail**:
  - LIRR runs commuter rail services to Long Island with service to and from Penn Station New York and service to Atlantic Terminal in Brooklyn, as well as Jamaica, Hunters Point Avenue, and Long Island City in Queens, where passengers can connect with subways or ferries to Manhattan. (The East Side Access project brings LIRR service into Grand Central Terminal, ***[and opened in December]*** 2022). LIRR serves 124 stations across its 11 branches: Montauk, Port Jefferson, Ronkonkoma, Babylon, West Hempstead, Long Beach, Hempstead, Oyster Bay, Far Rockaway, Port Washington, and the Main Line. These branches include 10 stops within the City Terminal Zone (1 in Manhattan at Penn Station New York; 3 in Brooklyn; 6 in Queens[12]). On a typical weekday, more than 89,000 riders cross into the Manhattan CBD via LIRR during the AM peak period. (The LIRR system map is available in **Appendix 4C-1**).
  - Metro-North provides commuter rail service for Westchester, Putnam, and Dutchess Counties in New York State (east of Hudson), Rockland and Orange Counties in New York State (west of Hudson) and Fairfield and New Haven Counties in Connecticut. Three east-of-Hudson lines terminate at Grand Central Terminal: the Hudson, Harlem, and New Haven lines. (The Penn Station Access project will connect Penn Station New York with the New Haven line, among other improvements. It is expected to take 63 months to complete). These three lines on a typical weekday carry about 85,000 passengers across the Manhattan CBD during the AM peak period.
  - NJ TRANSIT operates west-of-Hudson services (Port Jervis and Pascack Valley Lines) under contract to and from Hoboken Terminal in New Jersey and are considered part of the New Jersey sector for this analysis. West-of-Hudson travel to Penn Station New York is possible via

[10] The Manhattan and Bronx Surface Transit Operating Authority, as a subsidiary of NYCT, is also included in these numbers.
[11] Because data was collected in 2019, ongoing MTA NYCT bus network redesign projects for each borough have not been incorporated into the affected environment description.
[12] Mets-Willets Point Station in Queens operates only for special-event service.

a transfer to NJ TRANSIT rail in Secaucus, New Jersey.[13] (The Metro-North system map is provided in Appendix 4C-1).

- **PANYNJ:** PANYNJ operates commuter rail transit service between New York City and New Jersey via the PATH trains (service map available in Appendix 4C-1).[14] The routes originate from Hoboken, Jersey City, and Newark with New York City terminals at the World Trade Center and West 33rd Street. PATH service in Manhattan includes one train stop in Lower Manhattan and four stops between Greenwich Village and Midtown. PATH service has an AM peak-period ridership of about 100,000 passengers on a typical weekday. PATH ridership into the Manhattan CBD also includes NJ TRANSIT, Newark Light Rail, and Hudson-Bergen Light Rail customers who transfer to PATH in Newark, Jersey City, and Hoboken.

  PANYNJ also owns and operates the PABT at West 42nd Street and Eighth Avenue, as well as the George Washington Bridge Bus Station (GWBBS) at Broadway between West 178th and West 179th Streets, but it does not operate any of the bus services to and from these locations. Many New Jersey bus passengers transfer at the GWBBS to the New York City subway system to travel to the Manhattan CBD.

- **NJ TRANSIT:** NJ TRANSIT operates commuter rail and bus services into and out of the Manhattan CBD. Five NJ TRANSIT rail lines provide direct service to Penn Station New York. (The other NJ TRANSIT rail lines provide transfers to Penn Station New York at Newark and Secaucus, New Jersey, or to other destinations in the Manhattan CBD via PATH or ferries from Hoboken, New Jersey.) The NJ TRANSIT commuter rail system map is available in Appendix 4C-1.

  Numerous NJ TRANSIT bus routes serve Manhattan via the Lincoln Tunnel to the PABT. NJ TRANSIT also runs one bus route to Lower Manhattan via the Holland Tunnel. Some NJ TRANSIT bus routes serve the GWBBS in Upper Manhattan, where most passengers transfer to the A subway line (or No. 1 subway line several blocks away) to reach the Manhattan CBD. On a typical weekday, NJ TRANSIT commuter rail serves about 68,133 passengers while its bus operations carry about 148,364 passengers during the AM peak period.

  NJ TRANSIT also owns and operates the Hudson-Bergen Light Rail, which connects the communities of Bayonne, Jersey City, Hoboken, Weehawken, Union City, and North Bergen, Newark Light Rail, and the River Line, connecting Trenton and Camden, New Jersey. Hudson-Bergen Light Rail provides a transfer point to NJ TRANSIT rail, bus, PATH, and ferry services at Hoboken.

- **Private Bus Operators**: Various private bus operators serve the PABT, GWBBS, and on-street locations in the Manhattan CBD from origins in New Jersey, southern New York (west of the Hudson River), and eastern Pennsylvania. Private jitney buses operate from Hudson, Bergen, and Passaic Counties in New Jersey to the Manhattan CBD at the PABT and on-street around the bus terminal. Hampton Jitney operates daily bus service between eastern Long Island, New York and the Manhattan CBD as well as Upper Manhattan, using on-street stops in the Manhattan CBD. Additional long-distance bus operators such as Megabus, Peter Pan Bus, and Greyhound[15] also commission routes serving these corridors. Of

[13] Metro-North west-of-Hudson transfers constitute a small percentage of all west-of-Hudson transit trips routes.

[14] Although PATH is Federally classified as a commuter rail system, based on headways, stations, and boardings, and consistent with the NYMTC *Hub Bound Travel Data Report 2019*, it has been categorized as a subway system for this analysis.

[15] Greyhound also operates a commuter service to New York from a park-and-ride facility in southern New Jersey.

the private operators that participated in the 2015 PABT/GWBBS Continuous Bus Survey, 40 percent provided commuter service (defined through measures of distance and bus frequency), and all private operators collectively provided 27 percent—about 20,000 passengers—of AM peak-hour inbound PABT trips on a typical weekday.[16]

- **Amtrak:** Amtrak provides intercity rail service between Penn Station New York and destinations nationwide.[17] Amtrak's Northeast Corridor directly links Penn Station New York with Boston to the north, Washington, D.C., to the south, and key cities in between. The Empire Corridor links New York City with Albany and points west toward Buffalo, with the bulk of service provided between New York City and Albany. While Amtrak primarily serves long-distance travelers, some commuters also use these services as an alternative to commuter rail services provided by Metro-North or NJ TRANSIT. On a typical weekday, AM peak-period ridership on Amtrak in and out of Penn Station New York is about 6,700 passengers.
- **NICE**: NICE bus is the local bus system serving Nassau County and connecting passengers with western Suffolk County and Queens. It serves 48 MTA LIRR stations and 5 MTA NYCT subway stations that provide connectivity to the Manhattan CBD. (There is no NICE service directly to the Manhattan CBD.) Notable transfer points include but are not limited to Jamaica Center, 179th Street-Flushing, Far Rockaway (to MTA buses); Flushing, Jamaica, Far Rockaway (to NYCT subways); and Mineola Intermodal Transfer Center, Hicksville, Freeport, and Great Neck (to LIRR commuter rail). Prior to the COVID-19 pandemic, daily ridership of NICE service exceeded 100,000.[18]
- **Westchester County Department of Transportation/Bee-Line:** Westchester County's Bee-Line bus system operates a weekday-only direct express bus service from several suburban communities to the Manhattan CBD via 11 round trips each weekday, serving about 160 passengers in the AM peak period on a typical weekday. Bee-Line also provides connecting local bus services to NYCT subway service in the Bronx.
- **NYCDOT Staten Island Ferry:** NYCDOT provides free ferry service between Lower Manhattan and Staten Island via the Staten Island Ferry, with AM peak-period ridership of 19,866 inbound and outbound passengers on a typical weekday.
- **NYC Ferry:** The New York City Economic Development Corporation operates several NYC Ferry routes, which were originally introduced in 2017. As of 2019, these routes provide service between Manhattan, the Bronx, Brooklyn, and Queens. Expansion of this service in 2021 included a new route between Staten Island, Battery Park City, and Midtown at West 39th Street. A new route is planned between Wall Street/Pier 11 and Coney Island in Brooklyn, along with other route extensions and new stops. As

[16] 2015 PABT/GWBBS Continuous Bus Survey, which was prepared for the PANYNJ by VHB.

[17] Amtrak is categorized as suburban rail (here, commuter rail) in the NYMTC *Hub Bound Travel Data Report 2019* and is therefore described under **Section 4C.2**. Because these travelers are such a small proportion of Manhattan CBD commuters, they are not noted within **Section 4C.3**.

[18] LongIsland.com. 2019. "Nassau Inter-County Express (NICE)." https://www.longisland.com/business/nassau-inter-county-express-nice.html.

of fall 2019,[19] average daily ridership during peak months across all NYC Ferry routes (inbound and outbound) was about 23,000 passengers.[20]

- **Other Private Ferry Services:** Other ferry operators provide service to and from the Manhattan CBD. With the exception of New York Water Taxi, all providers offer routes between Manhattan and New Jersey. The New York Water Taxi operates around Lower Manhattan and Brooklyn. New York Water Taxi destinations include the South Street Seaport, Battery Park, and Midtown Manhattan, along with the DUMBO neighborhood in Brooklyn.

  Other operators include New York Waterway, Seastreak, and Liberty Landing Ferry. New York Water Taxi operates mostly as a tour operation, except for the IKEA route to and from Brooklyn. The New York Waterway ferry alone provides service to about 32,000 passengers on a typical weekday (inbound and outbound).[21]

- **Roosevelt Island Tramway:** The Roosevelt Island Tramway serves as a direct connection between Roosevelt Island and the rest of Manhattan via an aerial tram directly to the north of the Ed Koch Queensboro Bridge. (Access between Roosevelt Island and the Manhattan CBD is also provided by a stop on the F subway line, and the Roosevelt Island stop on the East River ferry line.) The tramway carries 859 passengers in the AM peak period into the Manhattan CBD on a typical weekday.

4C.3.2.2 RIDERSHIP DISTRIBUTION

Table 4C-3 presents the NYMTC *Hub Bound Travel Data Report 2019* daily weekday ridership[22] estimates by key transit service providers to the Manhattan CBD, as well as total trips by service provider.

[19] 2019 data for comparison to NYMTC *Hub Bound Travel Data Report 2019* of the same year.

[20] New York City Economic Development Corporation. 2018. *NYC Ferry Quarterly Update 7/1/17 - 9/30/17.* September 17. https://images.ferry.nyc/wp-content/uploads/2018/09/13143041/NYC-Ferry-2017-Q3-Quarterly-Update.pdf. NYC Ferry data is collected and published quarterly; this report includes ridership statistics from July through September 2019.

[21] AMNY. 2019. "Coast Guard suspends New York Waterway ferries over safety issues." https://www.amny.com/transportation/coast-guard-suspends-ny-waterway-ferries-over-safety-issues/.

[22] NYMTC *Hub Bound Travel Data Report 2019* presents person-trips into the Manhattan CBD, which is equivalent to the ridership at that location; the BPM similarly measures passenger load at a location unless otherwise noted.

Table 4C-3. Transit Ridership to and from the Manhattan CBD by Service Provider (AM Peak Period) (2019)

SERVICE PROVIDER	INBOUND PERSON-TRIPS		TOTAL PERSON-TRIPS[3]	
	Number of Trips	Percentage of Trips	Number of Trips	Percentage of Trips
Subway				
New York City Transit	962,665	91.9%	1,257,761	92.6%
Port Authority Trans-Hudson (PATH)	84,317	8.1%	100,515	7.4%
TOTAL	**1,046,982**	**100.0%**	**1,358,276**	**100.0%**
Commuter and Intercity Rail				
Long Island Rail Road	84,580	37.2%	89,500	35.8%
Metro-North Railroad	79,154	34.8%	85,582	34.2%
West of Hudson/NJ TRANSIT	60,295	26.5%	68,133	27.3%
Amtrak[2]	3,361	1.5%	6,711	2.7%
TOTAL	**227,390**	**100.0%**	**249,926**	**100.0%**
Buses				
New Jersey[1]	116,186	76.0%	148,364	77.8%
New York City Transit/MTA Bus	36,501	23.9%	42,245	22.1%
Westchester County DOT/Bee-Line	160	0.1%	160	0.0%
TOTAL	**152,847**	**100.0%**	**190,769**	**100.0%**
Ferries/Tramway[4]				
Staten Island Ferry	**16,881**	**49.2%**	**20,028**	**51.1%**
Roosevelt Island Tramway/Other Ferry	**17,430**	**50.8%**	**19,143**	**48.9%**
TOTAL	**34,311**	**100.0%**	**39,171**	**100.0%**

Source: NYMTC *Hub Bound Travel Data Report 2019*.

1 New Jersey bus trips include NJ TRANSIT, MTA buses via Staten Island, and private carriers.

2 Amtrak is classified under "commuter rail" for existing conditions data, consistent with the *Hub Bound Travel Data Report 2019* classification.

3 Total includes inbound and outbound person-trips.

4 The *Hub Bound Travel Data Report 2019* does not present operator data for ferry/tramway. All ferry trips from Staten Island can be assumed to be via Staten Island Ferry because this was the only transit service operating to the Manhattan CBD from Staten Island in 2019. The ferry number presented above contains cyclists aboard the ferry.

4C.3.3 Transit Ridership Overview

As summarized in Table 4C-4, approximately 75.2 percent of the more than 7 million daily person-trips into and out of the Manhattan CBD are made using transit (because transit accessibility is critical for low income commuters, Chapter 17, "Environmental Justice," provides an additional detailed assessment of transit ridership by income).[23] Based on the *Hub Bound Travel Data Report 2019*, the majority of these transit trips (57.5 percent of all trips into and out of the Manhattan CBD) are by subway. Commuter rail also serves a substantial proportion of trips made to the Manhattan CBD, followed by bus service. The proportion of transit trips is highest during the AM peak period, when 83.3 percent of trips are made via transit (Table 4C-5), which is why the analyses in this subchapter were conducted for the AM peak period. The AM peak period has the highest concentration of person- and vehicle-trips under baseline conditions and is typically used for assessing the effects of large-scale regional transportation projects.

In total, MTA bus services account for approximately 1.6 percent of all trips into and out of the Manhattan CBD. NJ TRANSIT bus service carries about 5.3 percent of all trips. Other private bus carriers (such as Greyhound, Coach USA, Academy, DeCamp, and Lakeland) with service to the PABT and on-street in Manhattan account for less than 1 percent of all trips into and out of the Manhattan CBD. The remaining 1.7 percent of Manhattan CBD transit trips are by ferry service (provided primarily by the Staten Island Ferry along with NYC Ferry, and private ferry companies) and the Roosevelt Island Tramway.

Table 4C-4. Daily Person-Trips by Mode to and from the Manhattan CBD on an Average Weekday (2019)

MODE	NUMBER OF PERSON-TRIPS	PERCENTAGE OF TOTAL
Transit		
Subway	4,398,284	57.5%
Commuter and Intercity Rail	685,330	9.0%
Buses	532,307	7.0%
Ferries	126,425	1.7%
Tramway	5,516	0.1%
Subtotal	5,747,862	75.2%
Non-Transit		
Auto/Taxi/Truck/Van	1,835,842	24.0%
Bicycle	65,588	0.8%
TOTAL	**7,649,292**	**100.0%**

Source: NYMTC *Hub Bound Travel Data Report 2019.*
Note: Data includes inbound and outbound trips. Staten Island Ferry person-trips include onboard bicyclists.

[23] For purposes of describing the share of Manhattan CBD-bound trips that are made using transit, bicycle and pedestrian trips were not included. On an average weekday about 67,000 bicycle trips (less than 1 percent) enter the Manhattan CBD daily (per the *Hub Bound Travel Data Report 2019*). Pedestrian trips are not included in the *Hub Bound Travel Data Report 2019*.

Table 4C-5. AM Peak-Period Person-Trips to and from the Manhattan CBD by Mode on an Average Weekday (2019)

MODE	NUMBER OF PERSON-TRIPS	PERCENTAGE OF TOTAL
Transit		
Subway	1,358,276	61.6%
Commuter and Intercity Rail	249,926	11.3%
Buses	190,769	8.7%
Ferries	38,084	1.7%
Tramway	1,087	0.1%
Subtotal	1,838,142	83.3%
Non-Transit		
Auto/Taxi/Truck/Van	356,022	16.1%
Bicycle	12,862	0.6%
TOTAL	**2,207,026**	**100.0%**

Source: NYMTC *Hub Bound Travel Data Report 2019.*
Note: Data includes inbound and outbound trips. Staten Island Ferry person-trips do include count of onboard bicycles.

4C.3.4 Existing Volumes Entering the Manhattan CBD (2019)

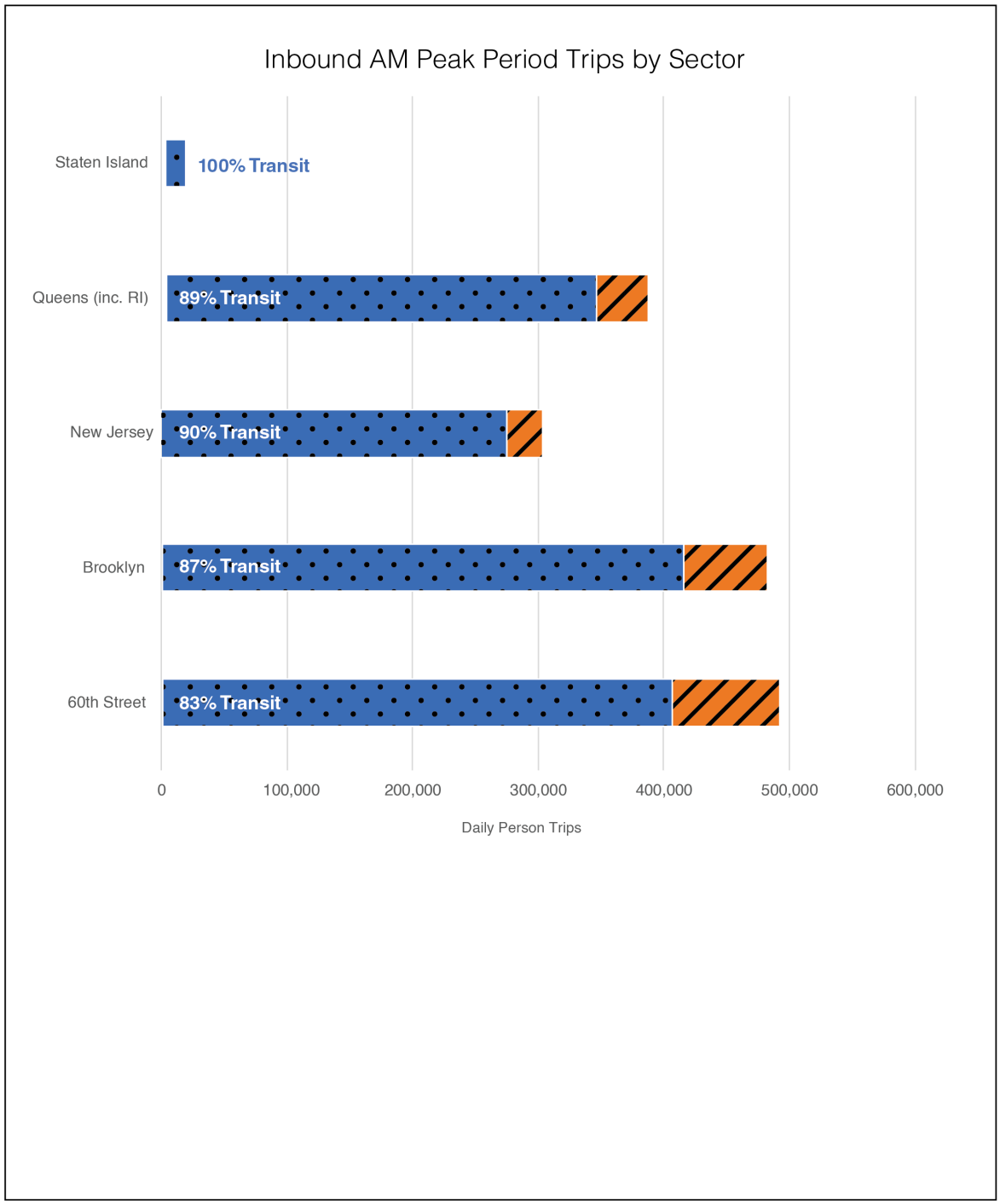
This section briefly describes existing (2019) transit ridership for trips into and out of the Manhattan CBD from the five geographic sectors that the *NYMTC Hub Bound Travel Data Report* uses to organize trips. These are defined according to entry and exit from the Manhattan CBD: Manhattan north of 60th Street, Queens, Brooklyn, Staten Island, and New Jersey/west of Hudson.[24] Figure 4C-4 shows the distribution and mode of all transit crossings (in relation to the total trips).

As shown on Figure 4C-4 and Figure 4C-5, the Manhattan – 60th Street sector carries the most total trips as well as the second-most transit trips of the five sectors. Even so, with 83 percent of trips from this sector made by transit, the Manhattan/60th Street sector has a lower proportion of its total trips made by transit than Queens (89 percent), New Jersey (90 percent), and Brooklyn (87 percent).[25]

[24] The boundary of the Manhattan CBD according to the *Hub Bound Travel Data Report* consists of 60th Street (including at the Franklin D. Roosevelt [FDR] Drive and West Side Highway/Route 9A), the East and Hudson Rivers, and New York Harbor. This boundary generally matches the boundaries defined for the Manhattan CBD, except that the Manhattan CBD does not include the FDR Drive and the West Side Highway/Route 9A.

[25] While the Ed Koch Queensboro Bridge ramps were considered as within the 60th Street sector (for autos/trucks/taxi trips), bus trips over the bridge as analyzed in this subchapter were considered within the Queens sector. Similarly, the F subway line entering from Roosevelt Island/Queens was categorized as coming from the Queens sector, although the subway tunnel actually crosses the 60th Street cordon line.

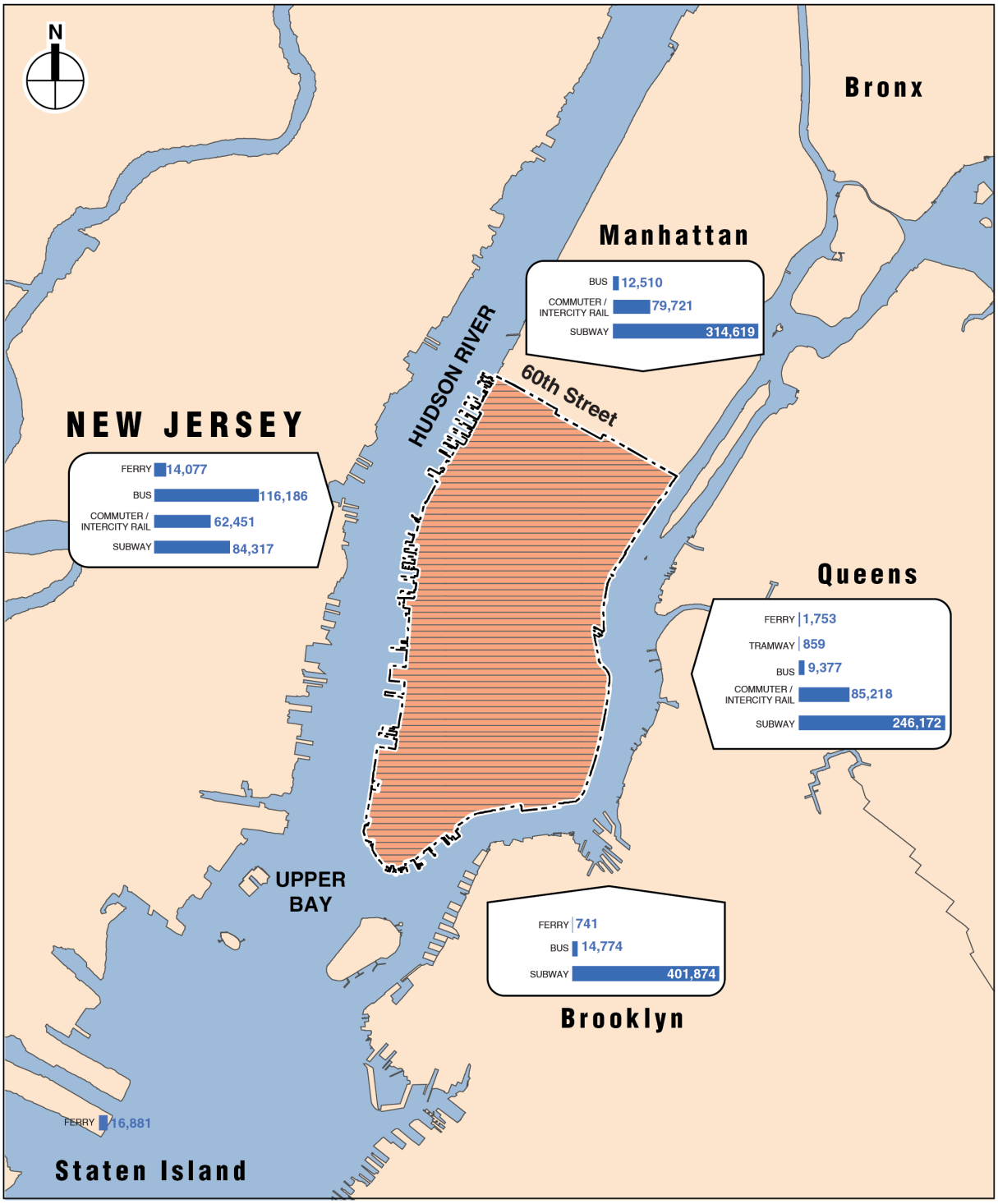
Figure 4C-4. Inbound AM Peak-Period Trips by Sector



Source: NYMTC *Hub Bound Travel Data Report 2019.*

Note: The *Hub Bound Travel Data Report 2019* does not provide vehicle data for Staten Island because vehicles arrive to the Manhattan CBD via Brooklyn or New Jersey; similarly Staten Island trips on express buses that run through New Jersey and Brooklyn without stopping there, as well as bus-to-subway transfers in Brooklyn, are counted in those sectors. Therefore the only direct trips shown for this table are transit trips via Staten Island ferry.

Figure 4C-5. Transit Modes into the Manhattan CBD by Volume at the Cordon Crossing (AM Peak Period)



Source: NYMTC *Hub Bound Travel Data Report 2019.*

The Staten Island sector has the smallest number of total trips. (The actual proportion of transit riders from this sector is lower since the *Hub Bound Travel Data Report* does not provide vehicle data for Staten Island because vehicles arrive to the Manhattan CBD via Brooklyn or New Jersey.) Staten Island trips on express buses that run through New Jersey and Brooklyn without stopping there, as well as bus-to-subway transfers in Brooklyn, are counted in those sectors.[26] Therefore, the only direct trips between Staten Island and the Manhattan CBD are via the ferry.

Appendix 4C-3 describes AM peak period ridership for each sector in greater detail.

4C.4 ENVIRONMENTAL CONSEQUENCES

4C.4.1 No Action Alternative

The evaluation of environmental consequences in this subchapter compares the CBD Tolling Alternative to the No Action Alternative in 2023. Because the *Hub Bound Travel Data Report 2019* used to describe the affected environment in Section 4C.3 is not directly comparable to the BPM results for 2023 for the No Action Alternative, this subchapter does not provide a discussion of the change in conditions between the affected environment discussed earlier and the No Action Alternative. The No Action Alternative conditions modeled from the BPM are compared to the CBD Tolling Alternative below.

BPM results were used to identify anticipated transit usage for the No Action Alternative in 2023 and 2045. The 2045 model includes background growth based on the projected overall growth in employment and population in the region and is consistent with the NYMTC 2045 Long Range Plan. More background on regional transportation effects is provided in Subchapter 4A, "Transportation: Regional Transportation Effects and Modeling." For the No Action Alternative, the transit system within and outside of the Manhattan CBD would be comparable to current availability and utility of the transit system.

4C.4.2 CBD Tolling Alternative

As set forth in Section 4C.4.2.2, all tolling scenarios would generate an increase in transit ridership compared to the No Action Alternative. The representative tolling scenarios with the highest incremental ridership increases are used to assess potential adverse effects in the following two areas:

- Line-Haul Assessment – The projected change in ridership at the maximum load point for each transit service is assessed for the CBD Tolling Alternative's effects on line-haul capacity (the capacity of a transit mode at its peak ridership point) for any increases that pass the screening threshold for detailed analysis, as discussed in Section 4C.2. The assessment is conducted for transit services by the delineated sector crossings into the Manhattan CBD as established in Section 4C.4.
- Station Assessment – A station-level assessment is provided for any transit station (including subway, PATH, or commuter rail) that exceeds CEQR thresholds of increased ridership of more than 200 passengers in a peak hour, also as discussed in Section 4C.2.

[26] The average weekday ridership of Staten Island express bus routes was 32,909 in 2019 (the same year as the *Hub Bound Travel Data Report 2019*), which is close to the total number of daily riders on the Staten Island Ferry. MTA data is available at http://web.mta.info/nyct/facts/ridership/ridership_bus.htm.

4C.4.2.1 CHANGE IN RIDERSHIP BY MODE AND OPERATOR

Table 4C-6 summarizes projected future ridership by all transit modes in 2023—for the No Action Alternative and CBD Tolling Alternative (Tolling Scenarios A through G) for the AM peak period—based on the results of the BPM.

While most of the analysis in this subchapter covers the year 2023, Table 4C-8 provides information for the horizon year 2045 in a format parallel to Table 4C-6 to show the longer-term projected level of environmental consequences based on BPM results.

All tolling scenarios would result in an increase in overall transit ridership of between 1.25 percent (Tolling Scenario A) and 1.77 percent (Tolling Scenario E) compared to the No Action Alternative for the entire regional study area. The rate of change across the tolling scenarios varies by about 33,000 trips, with the lowest projected increase occurring under Tolling Scenario A and the highest under Tolling Scenario E. This indicates that higher toll rates (Tolling Scenarios D, E, and F) would result in a higher shift to transit than lower toll rates (Tolling Scenarios A, B, and G). Tolling Scenario C reflects a middle area with higher tolls and more crossing credits than Tolling Scenarios A, B, and G, but lower tolls and fewer crossing credits than Tolling Scenarios D, E, and F. A table provides a percentage change summary for all the major transit elements evaluated in this subchapter including New York City subways that carry the majority of regional transit riders as well as commuter railroads, buses, ferries, and other transit services. A slightly higher increment is projected for Metro-North and ferry ridership under Tolling Scenario F. By 2045, transit ridership as a whole is projected to increase by several hundred thousand boardings (given assumptions in the NYMTC regional model).[27]

4C.4.2.2 COMPARISON ACROSS TOLLING SCENARIOS

Representative Tolling Scenario

The assessment identifies the representative tolling scenario with the highest incremental increase in ridership for specific transit elements. These transit elements are primarily drawn from Tolling Scenarios D, E, and F because these tolling scenarios are projected to experience the largest increases in transit ridership. (Tolling Scenario C has been identified as the representative case with the highest incremental increase in ridership for Newark Penn Station for both PATH and NJ TRANSIT.)

Analysis of Transit Lines and Transit Stations

Transit lines and transit stations were each analyzed using the representative tolling scenario with the highest incremental ridership increase to determine the maximum level of potential effects. For transit lines, the potential effects were measured by how train or bus loading (i.e., line-haul) conditions are expected to change. For transit stations, the potential effects were measured by the anticipated usage changes at fare control areas (FCA) (i.e., turnstiles and gates separating free and fare zones) and vertical circulation elements (VCE) (i.e., stairs and escalators).

[27] These increases are due to the NYMTC socioeconomic forecasts for the 28-county region. Most NJ TRANSIT rail boardings and alightings are in New Jersey at stations including Newark Penn Station, Secaucus Junction, and Hoboken Terminal. This results in only about 2,000 new alightings at Penn Station New York.

Table 4C-6. Transit Ridership: No Action Alternative and CBD Tolling Alternative (2023 AM Peak Period)

MODE	NO ACTION ALTERNATIVE	TOLLING SCENARIO A	TOLLING SCENARIO B	TOLLING SCENARIO C	TOLLING SCENARIO D	TOLLING SCENARIO E	TOLLING SCENARIO F	TOLLING SCENARIO G
Subway	3,138,960	3,184,961	3,187,374	3,192,428	3,199,370	3,203,052	3,199,783	3,197,389
New York City Transit	3,005,224	3,050,101	3,052,683	3,056,840	3,063,552	3,066,614	3,063,577	3,061,455
Port Authority Trans-Hudson (PATH)	133,736	134,860	134,691	135,588	135,818	136,438	136,206	135,934
Commuter and Intercity Rail	454,520	456,755	457,863	459,632	461,634	463,108	462,013	458,867
Long Island Rail Road	142,651	143,452	143,989	144,244	144,733	145,544	144,560	144,084
Metro-North Railroad	152,203	153,128	153,437	154,108	154,850	154,296	155,020	153,491
NJ TRANSIT	159,666	160,175	160,437	161,280	162,051	163,268	162,433	161,292
Buses	2,689,564	2,718,960	2,717,506	2,724,787	2,724,456	2,727,512	2,726,657	2,718,457
MTA buses	2,037,319	2,063,136	2,062,997	2,068,001	2,067,753	2,069,107	2,068,898	2,062,926
NJ TRANSIT	471,109	474,344	473,456	474,079	474,279	476,321	475,663	474,260
Other	181,136	181,480	181,053	182,707	182,424	182,084	182,096	181,271
Other Transit	58,635	60,073	60,225	60,467	60,474	60,475	60,712	60,246
Ferries	57,548	58,966	59,120	59,358	59,363	59,360	59,598	59,140
Tramway	1,087	1,107	1,105	1,109	1,111	1,115	1,114	1,106
TOTAL	**6,341,679**	**6,420,749**	**6,422,968**	**6,437,314**	**6,445,934**	**6,454,147**	**6,449,165**	**6,434,959**

Source: WSP, Best Practice Model 2021 and NYMTC *Hub Bound Travel Data Report 2019*.

Note: Data total over a 4-hour period, defined as total boardings, which include transfers. (Because this ridership estimate includes transfers, the ridership reported is greater than MTA NYCT MetroCard data that is widely available.) The BPM includes MTA buses, NJ TRANSIT buses, smaller regional bus carriers, and private carriers. (Other smaller carriers and private carriers are included under "Other Buses.") Tramway volumes were calculated using an incremental change factor derived from Queens/Roosevelt Island sector change per each tolling scenario.

Table 4C-7. Percentage Change in Transit Ridership: No Action Alternative and CBD Tolling Alternative (2023 AM Peak Period)

MODE	TOLLING SCENARIO A	TOLLING SCENARIO B	TOLLING SCENARIO C	TOLLING SCENARIO D	TOLLING SCENARIO E	TOLLING SCENARIO F	TOLLING SCENARIO G
Subway	**1.5%**	**1.5%**	**1.7%**	**1.9%**	**2.0%**	**1.9%**	**1.8%**
New York City Transit	1.5%	1.6%	1.7%	1.9%	2.0%	1.9%	1.8%
Port Authority Trans-Hudson (PATH)	0.8%	0.7%	1.4%	1.6%	2.0%	1.8%	1.6%
Commuter and Intercity Rail	**0.5%**	**0.7%**	**1.1%**	**1.6%**	**1.9%**	**1.6%**	**1.0%**
Long Island Rail Road	0.6%	0.9%	1.1%	1.5%	2.0%	1.3%	1.0%
Metro-North Railroad	0.6%	0.8%	1.3%	1.7%	1.4%	1.9%	0.8%
NJ TRANSIT	0.3%	0.5%	1.0%	1.5%	2.3%	1.7%	1.0%
Buses	**1.1%**	**1.0%**	**1.3%**	**1.3%**	**1.4%**	**1.4%**	**1.1%**
MTA buses	1.3%	1.3%	1.5%	1.5%	1.6%	1.6%	1.2%
NJ TRANSIT	0.7%	0.5%	0.6%	0.7%	1.1%	1.0%	0.7%
Other	0.2%	0.0%	0.9%	0.7%	0.5%	0.5%	0.1%
Other Transit	**2.5%**	**2.7%**	**3.1%**	**3.1%**	**3.1%**	**3.5%**	**2.7%**
Ferries	2.5%	2.7%	3.1%	3.2%	3.1%	3.6%	2.7%
Tramway	1.8%	1.7%	2.0%	2.2%	2.6%	2.5%	1.7%
TOTAL	**1.2%**	**1.3%**	**1.5%**	**1.6%**	**1.8%**	**1.7%**	**1.5%**

Source: WSP, Best Practice Model 2021 and NYMTC *Hub Bound Travel Data Report 2019* (Tramway), and analysis by FHI Studio.

Note: Data total over a 4-hour period, defined as percentage change in total systemwide boardings. The BPM includes MTA buses, NJ TRANSIT buses, other smaller regional bus carriers, and private carriers. (Other smaller carriers and private carriers are included under "Other Buses.") Tramway volumes were calculated using the average growth over a five-year period with an incremental change factor derived from Queens/Roosevelt Island sector change per each tolling scenario.

Table 4C-8. Transit Ridership: No Action Alternative and CBD Tolling Alternative (2045 AM Peak Period)

MODE	NO ACTION ALTERNATIVE	TOLLING SCENARIO A	TOLLING SCENARIO B	TOLLING SCENARIO C	TOLLING SCENARIO D	TOLLING SCENARIO E	TOLLING SCENARIO F	TOLLING SCENARIO G
Subway	3,505,040	3,556,434	3,552,926	3,559,460	3,569,286	3,576,311	3,572,538	3,557,745
New York City Transit	3,344,746	3,394,538	3,390,882	3,397,112	3,406,542	3,413,503	3,409,708	3,395,715
Port Authority Trans-Hudson (PATH)	160,294	161,896	162,044	162,348	162,744	162,808	162,830	162,030
Commuter and Intercity Rail	566,908	571,260	571,648	572,767	575,243	575,760	575,845	571,840
Long Island Rail Road	182,379	183,350	183,968	183,855	184,739	184,062	184,856	183,867
Metro-North Railroad	206,505	208,301	208,346	208,583	209,623	210,064	210,407	208,441
NJ TRANSIT	178,024	179,609	179,334	180,329	180,881	181,634	180,582	179,532
Buses	2,958,354	2,990,051	2,985,086	2,991,552	2,997,750	2,998,714	2,997,420	2,988,399
MTA buses	2,182,751	2,209,043	2,206,110	2,211,296	2,215,888	2,217,583	2,214,448	2,210,288
NJ TRANSIT	562,497	567,619	566,723	567,631	567,841	568,634	569,748	566,447
Other	213,106	213,389	212,253	212,625	214,021	212,497	213,224	211,664
Other Transit	**59,817**	**61,265**	**61,172**	**61,428**	**61,770**	**61,960**	**61,625**	**60,941**
Ferries	58,663	60,097	60,006	60,256	60,594	60,780	60,444	59,775
Tramway	1,154	1,168	1,166	1,172	1,176	1,180	1,181	1,166
TOTAL	**7,090,119**	**7,179,010**	**7,170,832**	**7,185,207**	**7,204,049**	**7,212,745**	**7,207,428**	**7,178,925**

Source: WSP; Best Practice Model 2021 and NYMTC *Hub Bound Travel Data Report 2019*.

Note: Data total over a 4-hour period, defined as total boardings, which include transfers. (Because this ridership estimate includes transfers, the ridership reported is greater than MTA NYCT MetroCard data that is widely available.) The BPM includes MTA buses, NJ TRANSIT buses, smaller regional bus carriers, and private carriers. (Other smaller carriers and private carriers are included under "Other Buses.") Tramway volumes were calculated using an incremental change factor derived from Queens/Roosevelt Island sector change per each tolling scenario.

Analysis primarily considered AM peak ridership based on concentration of ridership. For station element analyses, potential effects in the PM peak hour were also considered to account for differences in circulation and flow within the stations.

The overall effects by tolling scenario are summarized below, along with the identification of the representative tolling scenario with the highest incremental increase in ridership used in the detailed assessment of environmental consequences (see Section 4C.4).*[28]*

For assessing capacity of *transit lines* (line haul), incremental shifts to transit were analyzed based on the representative tolling scenario with the highest incremental ridership at the tolling boundary. Table 4C-9 shows the number of lines exceeding the threshold for triggering detailed analysis, across all tolling scenarios. Tolling Scenarios D, E, and F are projected to have the largest number of lines with ridership increases over 200 passengers,[29] with the highest increases among lines over the threshold under Tolling Scenarios E and F.

Table 4C-10 and Table 4C-11 show that of the seven modeled tolling scenarios, Tolling Scenario E is projected to have the largest number of stations exceeding thresholds in both the AM and PM peak hours, with a slightly lower number of stations exceeding thresholds under Tolling Scenarios A, D, F, and G. Because Tolling Scenario E projected the highest transit system ridership, it was selected as the tolling scenario for detailed analysis of stations requiring further analysis (except at one location in Newark, New Jersey—for both PATH and NJ TRANSIT—where Tolling Scenario C was selected for its greater station ridership increase). The incremental ridership at stations in the selected tolling scenario (Tolling Scenario E) is comparable to the increments in Tolling Scenarios D and F, and, therefore, representative of those tolling scenarios as well; the incremental increase in ridership in Tolling Scenarios A, B, C, and G are predominantly lower than in Tolling Scenarios D, E, and F.

4C.4.2.3 CHANGE IN RIDERSHIP AND EVALUATION OF LINE-HAUL CAPACITY BY SECTOR

This section assesses the incremental change in ridership (at the boundary of the Manhattan CBD), followed by maximum load point for each sector using the methodologies described in Section 4C.2. Table 4C-9 summarizes the increases across all sectors. Each row of the incremental change tables provided for each of the sectors crossing into the Manhattan CBD represents a particular link to the Manhattan CBD (such as buses entering via the Hugh L. Carey Tunnel, crossing the Brooklyn cordon) and provides the passenger load for the No Action Alternative and CBD Tolling Alternative, as well as the highest incremental change projected for the particular transit line on the representative tolling scenario predicted to result in the largest incremental increase in passenger demand. This series of sector tables presents AM peak period, inbound-only trips crossing the cordon line.

[28 For the Final EA, the Project Sponsors committed to additional mitigation measures (see Chapter 16, "Summary of Effects," Table 16-2). These new mitigation commitments neither require a change in the tolling scenarios used for the analyses in the EA nor change the fundamental conclusions of the EA (see Chapter 3, "Environmental Assessment Framework," Section 3.3.3).]

[29] CEQR identifies a threshold of 200 incremental riders per line as recommending further detailed analysis of line haul capacity (described further in Section 4C.2.1.1).

Table 4C-9. Transit Lines Triggering Detailed Line-Haul Analysis and Average Incremental Ridership Increase Across Tolling Scenarios (AM Peak Hour)

TOLLING SCENARIO	PORT AUTHORITY TRANS-HUDSON (PATH)		NEW YORK CITY TRANSIT SUBWAY		COMMUTER RAIL		BUS		TOTAL
	Number of Lines Exceeding Threshold	Average Incremental Ridership Increase	Number of Lines Exceeding Threshold	Average Incremental Ridership Increase	Number of Lines Exceeding Threshold	Average incremental Ridership Increase	Number of Lines Exceeding Threshold	Average Incremental Ridership Increase	Number of Lines Exceeding Threshold
A	0	—	1	290	0	—	0	—	**1**
B	0	—	1	231	2	296	0	—	**3**
C	0	—	3	244	1	376	0	—	**4**
D	0	—	5	248	3	315	0	—	**8**
E	1	234	5	265	4	282	0	—	**10**
F	0	—	7	249	3	326	0	—	**10**
G	1	242	1	235	1	232	0	—	**3**

Source: WSP, Best Practice Model 2021.
Note: Average incremental ridership increase is the average increase in passengers among stations with hourly passenger increments over the 200 passenger threshold. Following CEQR guidance, subway and commuter rail lines with a projected net hourly increase of 200 or more passengers trigger detailed line-haul analysis. Bus lines with a projected net hourly increase of 50 or more passengers also trigger detailed line-haul analysis.

Table 4C-10. Transit Stations Triggering Detailed Analysis and Average Incremental Ridership Increase Across Tolling Scenarios (AM Peak Hour)

TOLLING SCENARIO	PORT AUTHORITY TRANS-HUDSON (PATH)		NEW YORK CITY TRANSIT SUBWAY		COMMUTER RAIL		TOTAL
	Number of Stations Exceeding Threshold	Average Incremental Ridership Increase	Number of Stations Exceeding Threshold	Average Incremental Ridership Increase	Number of Stations Exceeding Threshold	Average Incremental Ridership Increase	Number of Stations Exceeding Threshold
A	0	—	15	307	2	201	**19**
B	0	—	15	319	3	412	**18**
C	1	240	15	340	4	440	**19**
D	2	223	16	380	3	532	**20**
E	2	290	18	382	3	621	**23**
F	2	268	16	386	4	539	**22**
G	1	266	13	325	4	267	**18**

Source: WSP, Best Practice Model 2021.
Note: Average incremental ridership increase is the average increase in passengers among stations with hourly passenger increments over the 200 passenger threshold. Following CEQR guidance, stations with a projected net hourly increase of 200 passengers trigger detailed station analysis. No bus stops triggered detailed analysis.

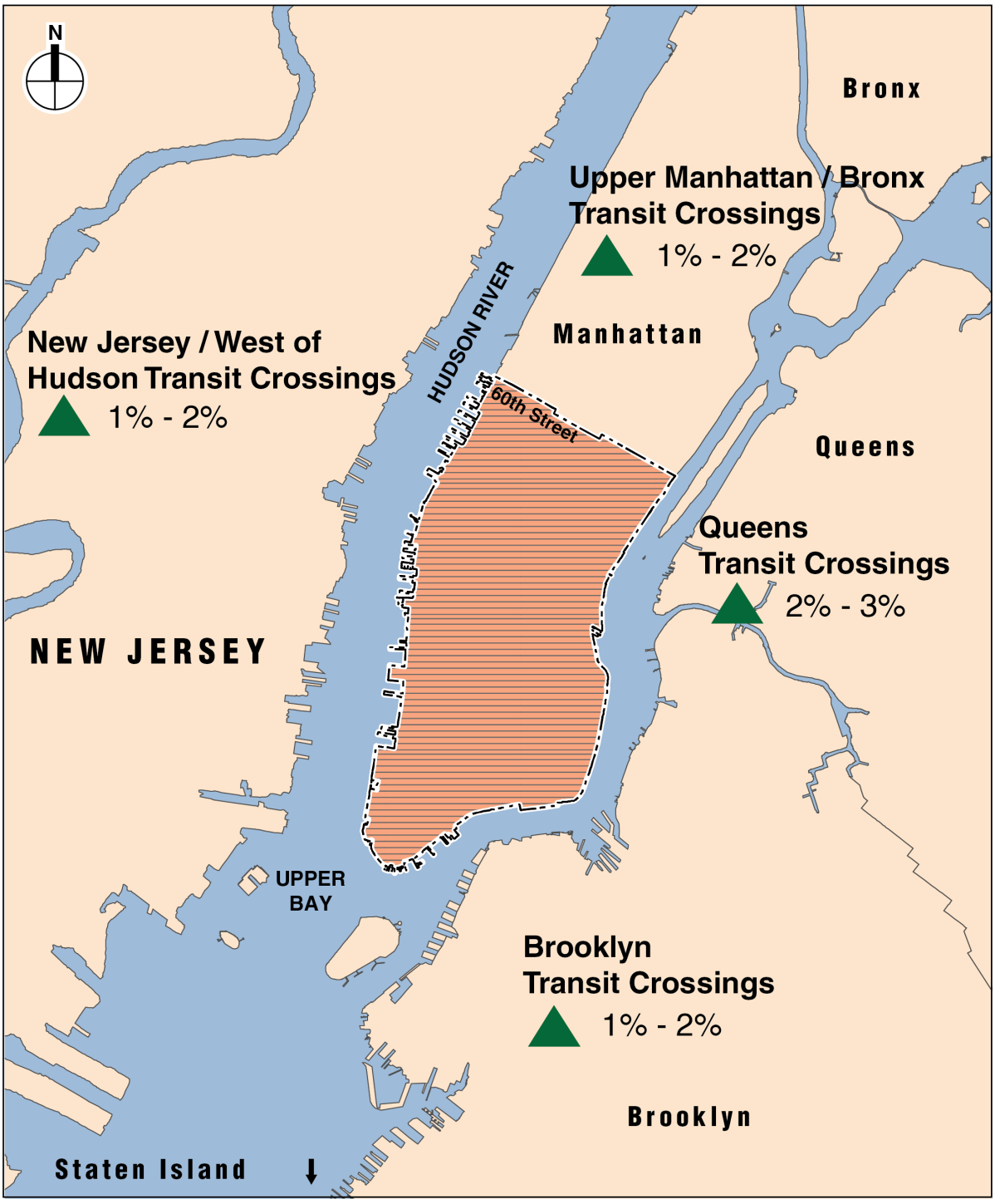
Table 4C-11. Transit Stations Triggering Detailed Analysis and Average Incremental Ridership Increase Across Tolling Scenarios (PM Peak Hour)

TOLLING SCENARIO	PORT AUTHORITY TRANS-HUDSON (PATH)		NEW YORK CITY TRANSIT SUBWAY		COMMUTER RAIL		TOTAL
	Number of Stations Exceeding Threshold	Average Incremental Ridership Increase	Number of Stations Exceeding Threshold	Average Incremental Ridership Increase	Number of Stations Exceeding Threshold	Average Incremental Ridership Increase	Number of Stations Exceeding Threshold
A	0	—	16	323	2	305	**20**
B	0	—	15	343	3	365	**18**
C	1	259	16	356	4	408	**20**
D	2	241	16	409	3	572	**20**
E	2	313	18	411	3	669	**24**
F	2	289	16	416	4	582	**25**
G	1	287	15	330	4	267	**20**

Source: WSP, Best Practice Model 2021.

Note: Following CEQR guidance, stations with a projected net hourly increase of 200 passengers trigger detailed station analysis.
PM incremental ridership is based on a higher PM peak-hour factor, resulting in slightly different increments than with the AM peak hour in **Table 4C-4**.

Figure 4C-6. Projected Change in Transit Crossings Entering the Manhattan CBD by Sector (2023 AM Peak Period)



Source: WSP, Best Practice Model 2021 and NYMTC *Hub Bound Travel Data Report 2019.*
Note: Figure shows range of incremental percentage increases across all tolling scenarios. Tramway volumes were calculated using an incremental change factor derived from Queens/Roosevelt Island sector change per each tolling scenario.

Each sector also includes an assessment of maximum passenger load at the individual line level, based on *CEQR Technical Manual* guidance, which identifies a peak hour within the 4-hour peak period.[30] In these tables, lines are grouped by transit link location, and passenger load per line is associated with the tolling scenario with the highest ridership at the Manhattan CBD boundary. In cases where the line or bus meets the threshold of further analysis based on peak-hour volumes, details on trains or buses per hour, cars per train, and incremental new passengers at these two levels are provided.

Manhattan – 60th Street

With the CBD Tolling Alternative, the number of transit trips crossing into the Manhattan CBD at the 60th Street boundary would increase slightly (in the AM peak period), with an average incremental growth of 2.2 percent across the sector. For most transit lines, the greatest increase would occur under Tolling Scenario E (Table 4C-12).

Table 4C-12. Projected Transit Ridership by Route at the Boundary between 60th Street and the Manhattan CBD (2023 AM Peak Period, Inbound)

	NO ACTION ALTERNATIVE	REPRESENTATIVE TOLLING SCENARIO		CHANGE	PERCENTAGE CHANGE
Subway					
Broadway (Nos. 1/2/3)	74,725	76,571	E	1,846	2.5%
Lexington Avenue (Nos. 4/5/6)	89,537	91,610	E	2,073	2.3%
Eighth Avenue (A/C/B/D)	88,153	90,086	E	1,933	2.2%
Second Avenue (Q)	24,502	25,119	E	617	2.5%
Commuter Rail (Metro-North Railroad)					
Hudson, Harlem, New Haven	97,340	99,258	E	1,918	2.0%
Buses					
York Avenue (M31)	282	285	E	3	1.0%
Second Avenue (M15, M15-SBS)	3,032	3,062	E	30	1.0%
Lexington Avenue (BXM1, M101)	1,610	1,626	E	16	1.0%
Fifth Avenue (BXM10, BXM11, BXM18, BXM3, BXM4B, BXM6, BXM7, BXM7A, BXM9, M01, M02, M03, M04)	5,748	5,805	E	57	1.0%
Broadway (BXM2, M05, M07, M10, M104, M20)	1,209	1,221	E	12	1.0%
Columbus Avenue (M11)	314	317	E	3	1.0%
West End Avenue (M57)	315	318	E	3	1.0%
Ferries/Tramway					
Ferries	1,106	1,122	E/F	16	1.5%

Source: WSP, Best Practice Model 2021 and NYMTC *Hub Bound Travel Data Report 2019.*
Note: Bus routes listed as identified in BPM. Bus volumes are calculated via average leave load at the bus stop before it crosses into the Manhattan CBD. Amtrak is not included in the BPM for modeled future conditions, because it is not considered a commuter transit choice in the BPM.

[30] In coordination with MTA, an AM peak-hour factor of 26 percent was identified for NYC Transit subway and all bus ridership (and was used for other transit operators as well). Based on identification of the peak-hour per commuter rail operator, a factor of peak-period ridership for the peak hour was derived: 41 percent for LIRR, 43 percent for Metro-North, 43 percent for NJ TRANSIT.

For subways, the lowest percentage change would occur on the Eighth Avenue Line (2.2 percent) and the largest increases would occur on the Broadway and Second Avenue Lines (2.5 percent). Ridership on the Second Avenue Line would increase by the smallest number, though the percentage increase would be within the range of other lines.

Bus ridership would remain largely equivalent to the No Action Alternative, with increases of up to about 120 new riders across the 27 bus lines in the AM peak period (less than 2 percent). No individual bus route for this sector is projected to increase by 50 or more riders in the inbound peak hour. This increase would be below the CEQR threshold for further analysis, and no adverse effects on bus ridership are expected for the representative tolling scenario nor any of the tolling scenarios.

Table 4C-13 presents projected ridership changes on these transit lines at their maximum load point.[31] Three subway lines would exceed the CEQR threshold of an increase of 200 or more passengers in the peak hour, including the No. 1 subway line (projected to increase by 232 passengers), the No. 2 subway line (projected to increase by 210 passengers), and the No. 6 subway line (projected to increase by 288 passengers). The Metro-North commuter lines crossing at 60th Street are also expected to increase by over 200 passengers with an additional 311, 272, and 211 new passengers on the Harlem, Hudson, and New Haven lines, respectively. No other transit lines are projected to exceed 200 passenger increases at the maximum load point, indicating that there would be no adverse effects anticipated as a result of the CBD Tolling Alternative at these locations.

Table 4C-14 provides the additional assessment necessary to evaluate maximum load points that exceed 200 new passengers in the peak hour. The table provides the peak-hour increment broken down into an estimated number of new passengers per train and new passengers per car. CEQR guidance provides that an increase of fewer than 5 passengers per car would be considered as having no adverse effect. Based on the scheduled number of between 6 and 17 peak-hour trains and the standard number of 10 cars per train, the subway lines are projected to have increases of less than 5 passengers with between 1.13 (No. 6 line) and 2.89 (No. 2 line). For Metro-North commuter lines, the range is 1.26 (New Haven) to 2.99 (Hudson) new passengers per car, which is also below the CEQR line-haul capacity criteria for adverse effects. Metro-North scheduled service includes 18 peak-hour trains with an average of 8 cars on the Harlem line, 21 scheduled trains with an average of 8 cars on the New Haven line, and 13 peak-hour trains with an average of 7 cars on the Hudson line. In summary, no adverse effects are anticipated on line-haul for the 60th Street sector.

[31] As noted in Section 4C.2, the maximum load point was calculated for the representative tolling scenario. Additional analysis was conducted for any subway or commuter rail routes where 200 or more new passengers were predicted and for any bus route where 50 or more new bus riders were predicted in the AM peak hour. This was calculated for inbound passenger volumes destined for the Manhattan CBD.

Table 4C-13. Projected New Passenger-Trips at Maximum Load Point for Routes Crossing into the Manhattan CBD at the 60th Street Boundary, (2023 AM Peak Period and Hour)

MODE	NEW PASSENGER-TRIPS	
	Peak Period	Peak Hour
Subway		
Broadway		
No. 1	892	232
No. 2	807	210
No. 3	530	138
Lexington Avenue		
No. 4	558	145
No. 5	348	90
No. 6	870	226
Eighth Avenue		
A	690	179
B	387	101
C	220	57
D	636	165
Second Avenue (Q)	603	157
Commuter Rail (Metro-North Railroad)		
Harlem	722	311
Hudson	632	272
New Haven	494	212
Buses		
York Avenue *(1 route)*	9	2
Second Avenue *(2 routes)*	48	12
Lexington Avenue *(4 routes)*	38	10
Fifth Avenue *(13 routes)*	103	27
Broadway *(4 routes)*	29	7
Columbus Avenue *(1 route)*	7	2
West End Avenue *(1 route)*	8	2

Source: WSP, Best Practice Model 2021; analysis prepared by WSP and FHI Studio.
Note: MTA NYCT data was used to analyze maximum load points for bus routes as of 2019. The tolling scenario used to derive this analysis matches the representative tolling scenario in **Table 4C-12.**

Table 4C-14. Projected Incremental Ridership Increases at Maximum Load Point for Routes Crossing into the Manhattan CBD at the 60th Street Boundary (2023 AM Peak Hour)

MODE	NEW PASSENGER-TRIPS		SCHEDULED TRAINS		NEW PASSENGER-TRIPS	
	Peak Period	Peak Hour	Trips/Hour	Cars/Train	Per Train	Per Car
Subway						
No. 1	892	232	19	10	13.64	1.36
No. 2	628	210	12	10	28.88	2.89
No. 6	870	226	20	10	11.31	1.13
Commuter Rail (Metro-North Railroad)						
Harlem	722	311	18	8	17.26	2.16
Hudson	632	272	13	7	20.92	2.99
New Haven	494	229	21	8	10.12	1.26

Source: WSP, Best Practice Model 2021; analysis prepared by WSP and FHI Studio.
Note: The tolling scenario used to derive this analysis matches the representative tolling scenario in **Table 4C-12**.

Queens/Roosevelt Island

With the CBD Tolling Alternative, in 2023 subway trips from Queens are projected to increase by less than 5 percent in the AM peak period in all tolling scenarios, with most subway lines having the largest increase in ridership under Tolling Scenario E. The N/R/W subway corridor would see the largest percentage increase (3.3 percent) at the boundary with the Manhattan CBD, which translates to 1,609 new riders, and the E/M subway lines would have the largest increase in numbers of passengers, with 1,889 new passengers between the two routes (an increase of 2.4 percent) (Table 4C-15).

Table 4C-15. Projected Transit Ridership at the Boundary between Queens/Roosevelt Island and the Manhattan CBD (2023 AM Peak Period, Inbound)

	NO ACTION ALTERNATIVE	REPRESENTATIVE TOLLING SCENARIO		CHANGE	PERCENTAGE CHANGE
Subway					
60th Street Tunnel (N/R/W)	48,940	50,548	E	1,609	3.3%
53rd Street Tunnel (E/M)	78,555	80,444	E	1,889	2.4%
Steinway Tunnel (No. 7)	68,283	70,122	E	1,839	2.7%
63rd Street Tunnel (F)	53,897	54,970	E	1,073	2.0%
Commuter Rail (Long Island Rail Road)					
All Routes	83,870	85,825	E	1,955	2.3%
Buses					
Queens-Midtown Tunnel* (BQM1, BM5, QM1, QM1A,QM2, QM3 QM4, QM5, QM6, QM7, QM8, QM10, QM11, QM12, QM15, QM16, QM17, QM18, QM20, QM21, QM24, QM25, QM31, QM32, QM34, QM35, QM36, X63, X64, X68)	8,601	8,695	E	94	1.1%
Ed Koch Queensboro Bridge (Q101, Q32, Q60)	777	786	E	9	1.1%
Ferries/Tramway					
Ferries	5,561	5,733	E	172	3.1%
Roosevelt Island Tramway**	859	878	E	22	2.6%

Source: WSP, Best Practice Model 2021 and NYMTC *Hub Bound Travel Data Report 2019.*

Note: Bus routes are listed as identified in the BPM. Bus volumes are calculated via average leave load at the bus stop before it crosses into the Manhattan CBD. Amtrak is not included in the BPM for modeled future conditions, because it is not considered a commuter transit choice in the BPM.

* Forecasts for Queens-Midtown Tunnel ridership have been estimated from the *Hub Bound Travel Data Report 2019* using the growth factor for all bus boardings per tolling scenario.

** Forecasts for ridership on the Roosevelt Island Tramway have been estimated using a growth factor based on a rate calculated using historic data collected through NYMTC. Tolling scenario ridership projections were based on the rate of change for all transit in the sector as modeled in the BPM.

Bus routes that enter the Manhattan CBD from Queens/Roosevelt Island would see the greatest ridership increases under Tolling Scenarios E and F. These routes are projected to increase by a relatively small number of passengers; buses crossing the Queens-Midtown Tunnel and Ed Koch Queensboro Bridge are not projected to see an increase of 50 or more new passengers. For LIRR ridership, the greatest rate of change would occur with Tolling Scenario E. Ferry trips and the Roosevelt Island Tramway would play a smaller role in the transportation system for trips entering the Manhattan CBD from the Queens/Roosevelt Island sector.

Table 4C-16 shows the increment at the maximum load point for each transit line entering the Manhattan CBD, and Table 4C-17 shows the results of the detailed analysis of line-haul capacity for transit lines. Each line on the N/R/W corridor from Queens/Roosevelt Island would not have an increase of more than 200 passengers in the peak hour and therefore do not warrant further analysis. Three subway lines connecting Queens to the Manhattan CBD would exceed the threshold of 200 new passengers in the AM peak hour. The E subway line ridership is projected to increase by 228 passengers, which would be 1.52 new passengers per car. The M subway line ridership, projected to increase by 264 passengers, would add 2.93 passengers per car. The additional 279 passengers on the F subway line would translate to 1.86 new passengers per car, which is lower than the impact threshold of 5 or more new passengers per car. The No. 7 local subway line is projected to increase by 377 riders in the AM peak hour—equivalent to 2.45 new passengers per car, which would be lower than the threshold for an adverse effect. For the LIRR, only the Babylon Branch with 331 new peak-hour passengers is projected to have an increase of greater than 200 passengers. Based on the scheduled 10 trains in the peak hour with an average of 10 cars per train, this results in 3.31 new passengers per car on average, which remains below the adverse effect threshold of 5 new passengers per car. No bus routes from Queens are projected to increase by over 50 passengers. In summary, none of the passenger increases on transit lines from Queens/Roosevelt Island would result in an adverse effect.

Table 4C-15. Projected New Passenger-Trips at Maximum Load Point for Routes Crossing into the Manhattan CBD from Queens/Roosevelt Island, (2023 AM Peak Hour)

MODE	PEAK PERIOD	AM PEAK HOUR
Subway		
60th Street Tunnel (R)	657	171
60th Street Tunnel		
N	386	100
W	369	96
53rd Street Tunnel		
M	1,014	264
E	876	228
Steinway Tunnel		
No. 7 (Local)	1,449	377
No. 7 (Express)	600	156
63rd Street Tunnel (F)	1,073	279
Commuter Rail (Long Island Rail Road)		
Babylon	808	331
Far Rockaway	147	60
Hempstead	127	52
Long Beach	50	20
Montauk	18	8
Oyster Bay	32	13
Port Jefferson	276	113
Port Washington	368	151
Ronkonkoma	232	95
West Hempstead	0	0
Buses		
Queens-Midtown Tunnel *(33 routes)*	94	25
Ed Koch Queensboro Bridge *(3 routes)*	41	11

Source: WSP, Best Practice Model 2021; analysis prepared by WSP and FHI Studio.

Note: The tolling scenario used to derive this analysis matches the representative tolling scenario in **Table 4C-15**. The projected ridership changes have been rounded to zero (0) for estimates at or below zero, to account for variability/noise in the BPM for lines where existing ridership is already relatively low. MTA NYCT data was used to analyze maximum load points for bus routes as of 2019.

Table 4C-16. Projected Incremental Ridership Increases at Maximum Load Point for Queens/Roosevelt Island (2023 AM Peak Hour)

MODE	NEW PASSENGER-TRIPS		SCHEDULED TRAINS		NEW PASSENGER-TRIPS	
	Peak Period	Peak Hour	*Trips/Hour*	*Cars/Train*	Per Train	Per Car
Subway						
53rd Street Tunnel						
M	1,014	264	9	10	29.28	1.93
E	876	228	15	10	15.18	1.52
Steinway Tunnel						
No. 7 (Local)	1,449	377	14	11	26.90	2.45
63rd Street Tunnel (F)	1,073	279	15	10	18.60	1.86
Commuter Rail (Long Island Rail Road)						
Babylon	808	331	10	10	33.1	3.31

Source: WSP, Best Practice Model 2021; analysis prepared by WSP and FHI Studio.
Note: The tolling scenario used to derive this analysis matches the representative tolling scenario in Table 4C-15. Because no bus routes met the threshold of 50 new passengers, none are included in this table.

Brooklyn

With the CBD Tolling Alternative, subway, ferry and bus ridership between Brooklyn and the Manhattan CBD would see increases under all tolling scenarios (**Table 4C-18**). These increases would be less than 4 percent on any given subway line or ferry and approximately 6 percent for buses. During the AM peak period, Tolling Scenario F would increase subway ridership from Brooklyn the most (although the tolling scenario projections would have limited variation). Projected incremental passengers range from 1.3 to 2.7 percent for subway lines. The largest increases in bus ridership would occur under Tolling Scenario B with 136 riders (a nearly 9 percent increase).

Table 4C-17. Projected Transit Ridership by Routes at the Boundary between Brooklyn and the Manhattan CBD (2023 AM Peak Period, Inbound)

	NO ACTION ALTERNATIVE	REPRESENTATIVE TOLLING SCENARIO		CHANGE	PERCENTAGE CHANGE
Subway					
Canarsie Tunnel (L)	42,607	43,583	F	976	2.3%
Williamsburg Bridge (J/M/Z)	37,216	38,411	F	1,195	3.2%
Rutgers Street Tunnel (F)	37,006	37,921	F	915	2.5%
Manhattan Bridge (B/D/N/Q)	100,921	103,654	D	2,734	2.7%
Cranberry Street Tunnel (A/C)	66,013	67,173	F	1,160	1.8%
Clark Street Tunnel (Nos. 2/3)	29,316	30,073	E	757	2.6%
Montague Street Tunnel (R)	10,143	10,301	F	158	1.6%
Joralemon Street Tunnel (Nos. 4/5)	28,696	29,446	D	750	2.6%
Buses					
Hugh L. Carey Tunnel (BM1, BM2, BM3, BM4)	4,376	4,421	B	45	1.0%
Williamsburg Bridge (B39)	29	29	B	0	1.0%
Ferries/Tramway					
Ferries	3,462	3,513	F	51	1.5%

Source: WSP, Best Practice Model 2021 and NYMTC *Hub Bound Travel Data Report 2019*; analysis prepared by WSP and FHI Studio.

Note: MTA NYCT data was used to analyze bus routes as of 2019. Bus volumes are calculated via average leave load at a bus stop before a bus crosses into the Manhattan CBD.

No bus routes with an origin point in Brooklyn are projected to see an increase of more than 50 new passengers in the AM peak hour, the CEQR threshold for further analysis, indicating that there would be no adverse effect from the change in ridership.

As summarized in **Table 4C-19**, the A, D, F, and L subway lines are projected to have an increase of more than 200 riders in the AM peak hour, while the incremental change would be below 200 riders for the Manhattan-bound Nos. 2/3; Nos. 4/5; and C, J/M, N/Q, and R subway lines.

Table 4C-18. Projected New Passenger-Trips at Maximum Load Point for Routes Crossing into the Manhattan CBD from Brooklyn (2023 AM Peak Period and Hour)

MODE	AM PEAK PERIOD	AM PEAK HOUR
Subway		
Clark Street Tunnel		
No. 2	165	43
No. 3	345	90
Joralemon Street Tunnel		
No. 4	664	173
No. 5	588	153
Cranberry Street Tunnel		
A	859	224
C	334	87
Rutgers Street Tunnel (F)	1,033	269
Canarsie Tunnel (L)	976	254
Williamsburg Bridge		
J	674	175
M	502	130
Manhattan Bridge		
B	616	160
D	867	226
N	634	165
Q	685	178
Montague Street Tunnel (R)	640	166
Buses		
Hugh L. Carey Tunnel *(6 routes)*	45	12
Williamsburg Bridge *(1 route)*	0	0

Source: WSP, Best Practice Model 2021; analysis prepared by WSP and FHI Studio.
Note: MTA NYCT data was used to analyze maximum load points for bus routes as of 2019. The tolling scenario used to derive this analysis matches the representative tolling scenario in **Table 4C-17**.

Table 4C-20 summarizes the maximum load point analysis for the four subway lines exceeding the 200-passenger increase in the AM peak hour:

- The A subway line with a projected increase of 224 passengers and 1.64 new passengers per subway car on average
- The D subway line with 226 new passengers or about 2.82 per car
- The F subway line with 269 new passengers or 2.07 per car
- The L subway line with 254 new passengers or 1.59 per car

These increases are all below the threshold increment of 5 or more new passengers per car, and there would be no anticipated adverse effect on any transit lines entering the Manhattan CBD from Brooklyn.

Table 4C-19. Projected Incremental Ridership Increases at Maximum Load Point for Brooklyn (2023 AM Peak Hour)

MODE	NEW PASSENGER-TRIPS		SCHEDULED TRAINS		NEW PASSENGER-TRIPS	
	Peak Period	Peak Hour	Trips/Hour	Cars/Train	Per Train	Per Car
Subway						
Cranberry Street Tunnel (A)	858	224	17	8	13.13	1.64
Rutgers Street Tunnel (F)	1,033	269	13	10	20.67	2.07
Canarsie Tunnel (L)	976	254	20	8	12.69	1.59
Manhattan Bridge (D)	867	226	10	8	28.18	2.82

Source: WSP, Best Practice Model 2021; analysis prepared by WSP and FHI Studio.
Note: The tolling scenario used to derive this analysis matches the representative tolling scenario in Table 4C-17. Because no bus routes met the threshold of 50 new passengers, none are included in this table.

Staten Island

With the CBD Tolling Alternative, passenger-trips by ferry from Staten Island to the Manhattan CBD during the AM peak period are projected to increase by about 7 percent under the representative tolling scenario (Table 4C-21). Many of these passengers could be transferring to buses and subways in the Manhattan CBD, which is accounted for in the BPM results.

Table 4C-20. Projected Transit Ridership by Routes Crossing into the Manhattan CBD from Staten Island (2023 AM Peak Period, Inbound)

	NO ACTION	REPRESENTATIVE TOLLING SCENARIO		CHANGE	PERCENTAGE CHANGE
Ferry	17,768	19,002	C	1,234	6.9%
Buses					
Hugh L. Carey Tunnel (SIM1, SIM2, SIM3, SIM4, SIM5, SIM6, SIM7, SIM9, SIM10, SIM11, SIM15, SIM31, SIM31, SIM32, SIM33, SIM34, SIM35)	10,236	10,837	C	601	5.9%
Lincoln Tunnel (SIM8, SIM22, SIM25, SIM26, SIM30)	2,906	3,049	C	143	4.9%

Source: WSP, Best Practice Model 2021; analysis prepared by WSP and FHI Studio.
Note: MTA NYCT data was used to analyze bus routes as of 2019. (Staten Island Express Bus Routes SIM23 and SIM24 were operated by Academy Bus Company via contract with the New York City Economic Development Corporation in 2019, but as of January 2022, the routes are now operated by MTA Bus.) Bus volumes are calculated via the average leave load at the bus stop before it crosses into the Manhattan CBD. Due to rounding, some numbers in this table may not add up.

Ridership on express bus routes from Staten Island via New Jersey would increase under the representative tolling scenario, with an increase of 5.9 percent on buses via Brooklyn and 4.9 percent on buses via New Jersey. This translates to fewer than 50 new passengers on all buses; no bus routes with an origin point in Staten Island are projected to see an increase of more than 50 new passengers in the AM peak hour. Therefore, no adverse effects are anticipated from the representative tolling scenario nor any of the CBD Tolling Alternative scenarios.

The Staten Island Ferry serves commuters who transfer from the Staten Island Railway or from local buses, who bike or walk to the ferry terminal, and who arrive by vehicle. Rides on the ferry are also a popular tourist activity. It is expected that ridership on the new NYC Ferry St. George route (launched in 2021) would divert some travelers who previously used the Staten Island Ferry, because the NYC Ferry would provide a convenient connection to western Midtown Manhattan for some commuters in place of a transfer to the subway in Lower Manhattan to reach Midtown. No adverse effects on Staten Island Ferry service levels are expected as a result of the CBD Tolling Alternative.[32]

Table 4C-22 shows the increment at the maximum load point for Staten Island express buses that travel within Brooklyn and New Jersey to enter the Manhattan CBD. No bus routes within this sector are projected to experience over 50 new passengers.

Table 4C-21. Projected New Passenger-Trips at Maximum Load Point for Staten Island Express Bus Routes (2023 AM Peak Period and Hour)

MODE	AM PEAK PERIOD	AM PEAK HOUR
Bus		
Staten Island express via Hugh L. Carey Tunnel *(16 routes)*	447	116
Staten Island express via Lincoln Tunnel *(5 routes)*	66	17

Source: WSP, Best Practice Model 2021; analysis prepared by WSP and FHI Studio.
Note: MTA NYCT data was used to analyze maximum load points for bus routes as of 2019. The tolling scenario used to derive this analysis matches the representative tolling scenario in Table 4C-20.

New Jersey/West of Hudson

The CBD Tolling Alternative would result in modest increases in ridership on transit services from the New Jersey/west-of-Hudson sector (Table 4C-23). The largest change as a percentage, would occur on PATH service to Midtown Manhattan (33rd Street), which would see 1,555 new passengers in the AM peak period with Tolling Scenario E, an increase of 3.8 percent. PATH service to Lower Manhattan (World Trade Center) would have a smaller increase, with an estimated 1,201 new passengers in the AM peak period (an increase of 1.7 percent). Ridership would increase by 2.3 percent under Tolling Scenario E for NJ TRANSIT rail service. For buses from New Jersey, ridership would increase less than 2 percent, with 1,656 new passengers on buses through the Lincoln and Holland Tunnels with the representative tolling scenario for each (Tolling Scenarios E and D, respectively). Privately operated ferries would see the greatest increases under Tolling Scenario D, with a projected increase of 207 new passengers.

[32] Based on an analysis of the projected increase in morning peak hour ridership on the Staten Island Ferry and based on the capacity of each ferry and the frequency of operation, adverse effects are not anticipated from the Project.

Table 4C-22. Projected Transit Ridership by Routes at the Boundary between New Jersey/West-of-Hudson and Manhattan CBD (2023 AM Peak Period, Inbound)

	NO ACTION	REPRESENTATIVE TOLLING SCENARIO		CHANGE	PERCENTAGE CHANGE
Subway					
PATH (33rd Street)	40,731	42,286	E	1,555	3.8%
PATH (World Trade Center)	71,773	72,974	F	1,201	1.7%
Commuter Rail					
NJ TRANSIT	59,721	61,068	E	1,348	2.3%
Buses					
Lincoln Tunnel*	106,849	108,390	E	1,541	1.4%
Holland Tunnel*	6,431	6,547	D	116	1.8%
Ferries/Tramway					
Ferries	8,123	8,329	D	207	2.5%

Source: WSP, Best Practice Model 2021 and NYMTC *Hub Bound Travel Data Report 2019;* analysis prepared by WSP and FHI Studio.

Note: Metro-North west-of-Hudson service connects to the Manhattan CBD via a transfer at Secaucus Junction. Those riders represent a small proportion of total west-of-Hudson trips and are included under the Commuter Rail/NJ TRANSIT classification in these results summaries.

* Bus routes listed as identified in BPM:
NJ TRANSIT Lincoln Tunnel: #107, #108, #112, #113, #114, #115, #116, #117, #119, #122, #123, #125, #126, #127, #128, #129, #130, #131, #132, #133, #135, #136, #137, #138, #139, #144, #145, #148, #151, #153, #154, #155, #156, #157, #158, #159, #160, #161, #162, #163, #164, #165, #166, #167, #168, #177, #190, #191, #192, #193, #194, #195, #196, #197, #199, #319, #320, #321, #324
NJ TRANSIT Holland Tunnel: #120
Other Carriers Lincoln Tunnel: Bergen County/Suffern, CC Route 77, DC Route 32, DC Route 33, DC Route 44, DC Route 66, DC Route 88, DC Route 99, Jackson – Midtown, Jackson – PABT, Lincroft/Exit 109 – PABT, LK 46/80 to PABT, LK 46/80 to Wall St., LK 78 to PABT, LK 80 to PABT, Monsey – Midtown, MZ, Orange – Chester/Midtown, Orange – Newburgh/West Pt, Orange xPA84, Palisades, Pkwy Exp – PABT, PNC Center – PABT, Route 100 to PABT, Route 300/8A to Midtown, Route 300/8A to PABT, Route 35 – PABT, Route 36 – PABT, Route 400 Express to PABT, Route 500 to Midtown, Route 55 – Bloomfield, RT 11A, Rt 14 – PABT, RT 20 – PABT, RT 21, RT 45, RT 46, RT 47, RT 49, RT 9 – PABT, Sayreville – Midtown, TB North, TB South
Other Carriers Holland Tunnel: Jackson – Downtown, Lincroft/Exit 109 – Wall St, Pkwy Exp – Wall St, PNC Center, Red Bank, Route 300/8A, Route 36 – Wall St, Route 600 to Wall St, Route 9 to Wall St, Sayreville – Wall St, TB North to Wall St, West Caldwell

Table 4C-24 shows the increment of passengers at the maximum load point for transit lines entering the Manhattan CBD via New Jersey. The 33rd Street PATH line from Hoboken would have an increase of 234 new passengers in the AM peak hour, which is above the CEQR 200 passenger increase per peak-hour threshold for line-haul analysis. Based on BPM results, no bus routes would have increases of more than 50 new passengers in the AM peak hour in the representative tolling scenario.[33] Although total NJ TRANSIT commuter rail ridership would increase by more than 200 passengers overall, no individual routes would increase by more than 200 new passengers.

[33] Although the BPM projects ridership for individual routes, these route-specific projections do not have a high level of accuracy; therefore, increases are discussed relative to the route "family" for this assessment, although it is likely that route patterns do not all cover all bus stops for the route family.

Table 4C-23. Projected New Passenger-Trips at Maximum Load Point for Routes Crossing into the Manhattan CBD from New Jersey/West of Hudson (2023 AM Peak Period and Peak Hour)

MODE	AM PEAK PERIOD	AM PEAK HOUR
Subway		
PATH (33rd Street)		
Hoboken Line	898	234
Journal Square Line	657	171
PATH (World Trade Center)		
Hoboken Line	605	157
Newark Line	596	155
Commuter Rail (NJ TRANSIT)*		
Montclair-Boonton Line	305	125
Morris & Essex Line	273	112
Northeast Corridor Line	420	172
North Jersey Coast Line	309	127
Buses		
Lincoln Tunnel (104 routes)	1,462	380
Holland Tunnel (13 routes)	91	24

Source: WSP, Best Practice Model 2021; analysis prepared by WSP and FHI Studio.
Note: The tolling scenario used to derive this analysis matches the representative tolling scenario in **Table 4C-22**.
* Metro-North west-of-Hudson commuter trains (Port Jervis, Pascack Valley) transfer at Secaucus Junction to enter the Manhattan CBD and are therefore incorporated into NJ TRANSIT incremental passenger-trips.

As shown in **Table 4C-25**, the increases on the PATH 33rd Street Hoboken line are estimated to result in an average increase of about 3.34 new passengers per car, which is below the 5-passenger threshold, indicating that there would be no adverse effect. In summary, no transit line originating in New Jersey would result in an adverse effect on maximum load point for the representative tolling scenario and, therefore, for any tolling scenario.

Table 4C-24. Projected Incremental Ridership Increases at Maximum Load Point for New Jersey/West of Hudson (2023 AM Peak Hour)

MODE	NEW PASSENGER-TRIPS		SCHEDULED BUSES/TRAINS		NEW PASSENGER-TRIPS	
	Peak Period	Peak Hour	Trips/Hour	Cars/Train	Per Train/Bus	Per Car
Subway						
PATH (33rd Street)						
Hoboken	898	234	10	7	23.35	3.34

Source: WSP, Best Practice Model 2021; analysis prepared by WSP and FHI Studio.
Note: The tolling scenario used to derive this analysis matches the representative tolling scenario in **Table 4C-22**.

4C.4.2.4 EVALUATION OF BUSES ACROSS SECTORS

In early public outreach, concerns regarding increases in bus ridership that could result from Project implementation were expressed. Commenters asked if additional buses would be needed to account for ridership increases. Based on the line-haul capacity analysis results, which examined bus ridership at the point where the route would be the most crowded, no buses would cross the threshold for requiring detailed line-haul analysis; therefore, no adverse effects on bus lines are projected. This means that no new buses would be required to support ridership increases stemming from the Project.

Local Bus Ridership

As shown in Table 4C-26, overall bus ridership is projected to increase slightly due to the Project, from 1.0 percent (in Tolling Scenario B) to 1.4 percent (in Tolling Scenarios E and F). The analysis considered the change in overall bus ridership due to the Project, examining the aggregation of bus ridership into three groupings or categories of bus routes: "cordon" bus routes (which pass through the Manhattan CBD tolling cordon or boundary); "feeder" bus routes (which serve at least one rail station); and "local" bus routes (which do not cross the Manhattan CBD cordon or serve a rail station).

Table 4C-25. Projected Change in Bus Ridership Among Scenarios Compared to No Action Alternative (2023 AM Peak Period)

TYPE OF BUS ROUTE	TOLLING SCENARIO A	TOLLING SCENARIO B	TOLLING SCENARIO C	TOLLING SCENARIO D	TOLLING SCENARIO E	TOLLING SCENARIO F	TOLLING SCENARIO G
Change in ridership vs. No Action Alternative							
Cordon bus routes	4,554	3,657	5.543	6,470	7,806	6,105	4,886
Feeder bus routes	23,813	23,577	28,877	27,523	29,047	29,770	23,082
Local bus routes	977	681	676	748	977	1,159	741
Total Change vs. No Action Alternative	**29,345**	**27,916**	**35,097**	**34,742**	**37,830**	**37,034**	**28,709**
Percentage change in ridership vs. No Action Alternative							
Cordon bus routes	1.0%	0.8%	1.2%	1.4%	1.6%	1.3%	1.0%
Feeder bus routes	1.1%	1.1%	1.4%	1.3%	1.4%	1.4%	1.1%
Local bus routes	1.2%	0.8%	0.8%	0.9%	1.2%	1.4%	0.9%
Total Change vs. No Action Alternative	**1.1%**	**1.0%**	**1.3%**	**1.3%**	**1.4%**	**1.4%**	**1.1%**

Source: WSP, Best Practice Model 2021.
Note: Data total over a 4-hour period, defined as total boardings, which include transfers. (Because this ridership estimate includes transfers, the ridership reported is greater than MTA NYCT MetroCard data that is widely available.) The BPM includes MTA buses, NJ TRANSIT buses, smaller regional bus carriers, and private carriers. (Other smaller carriers and private carriers are included under "Other Buses.")

Based on BPM results for 2023, the projected systemwide increases in bus ridership for the morning peak period across the seven tolling scenarios (A, B, C, D, E, F, and G) would range between 0.7 and 1.6 percent for cordon, feeder, and local bus routes. For any given tolling scenario, local buses routes would mostly have a lower percentage increase than feeder or cordon routes. Under Tolling Scenario A, B, and F, some local bus routes would have a higher percentage increase than feeder routes, or both feeder and cordon routes.

With each bus accommodating 54 to 85 passengers, such increases would, on average, amount to no more than one or two additional passengers per bus. This level of increase in bus ridership is generally imperceptible and is anticipated as a 1.0 to 1.4 percent average increase, systemwide.

A closer look was taken at subway stations that may serve as important transfer points between buses and subways, to examine whether the increased bus ridership could be more pronounced at those locations. Twenty-three subway stations (see Table 4C-27 and Table 4C-28) are projected to serve more than 200 additional passengers in the AM peak hour under the CBD Tolling Alternative. Five stations outside Manhattan are projected to see increases above the 200-passenger increment threshold (Court Square, Atlantic Av – Barclays Center, Flushing-Main Street, Broadway Junction, 168 St – Washington Heights), with increments between 204 and 332 in the AM peak hour.

At most of the 23 subway stations identified above, based on inputs from NYCT operations planners, approximately 10 percent of the total increment of subway passengers would be a result of transfers to/from buses. This proportion was applied to estimate the amount of passenger volumes attributed to bus-to-subway or subway-to-bus transfers that would traverse station fare control area and vertical circulation elements.

4C.4.2.5 TRANSIT STATION ASSESSMENT

This section provides an assessment of the CBD Tolling Alternative's effect on specific transit stations where the number of passengers would exceed the CEQR threshold of 200 incremental peak-hour passengers. As indicated in Section 4C.4.2, this assessment uses Tolling Scenario E as the representative tolling scenario with the largest increase in transit ridership overall relative to the No Action Alternative. The results of this analysis provide an understanding of the likely range of anticipated adverse effects from the proposed Project and identify potential improvement strategies to address these effects.

Under the CBD Tolling Alternative, the regional transit system is projected to see overall increases of under 2 percent increase although ridership increases would vary by mode and station. This analysis considers whether projected increases in passenger volumes at specific stations would adversely affect facility elements used by passengers and whether improvements at those stations would be necessary to avoid potential adverse effects.

According to the *CEQR Technical Manual,* transit station analyses may be warranted if a proposed project is expected to generate 200 new passenger movements in a peak hour at a given station. Based on BPM results for 2023, the transit stations where the CBD Tolling Alternative (Tolling Scenario E) would add more than 200 new passengers during the peak hour (including all transfers, boardings, and alightings) were identified. Passengers transferring between cross-platform lines were not included because transferring passengers would not interact with FCA and VCE station circulation elements (turnstiles, stairs, escalators). However, transfers to another line within the same station complex or transfers to/from bus routes outside of the station were included because these incremental movements could affect the function of station circulation elements.

Locations of Stations Exceeding Threshold

Based on the BPM results for 2023, 26 commuter rail and subway stations are projected to have ridership increases of more than 200 new passengers with most stations located within New York City. For locations where the CEQR screening assessment indicates that further analysis is warranted, the *CEQR Technical Manual* calls for evaluation of capacity of the notable FCA and VCE station elements in the path of travel. Table 4C-27 shows projected AM peak-hour increments, and Table 4C-28 provides the corresponding PM peak-hour increments. (PM increments were estimated in coordination with NYCT by applying a different peak-hour factor onto the BPM AM peak-period results.)

Five of the stations meeting the threshold are affiliated with cross-Hudson trips—either in New Jersey or the Manhattan CBD. In New Jersey, three transit stations would have an increase of more than 200 passengers: Secaucus Junction Station, Hoboken Terminal, and Newark Penn Station. The other two stations are at New Jersey-serving hubs inside the Manhattan CBD. At Secaucus—one of a few major transfer points between northern New Jersey and Rockland and Orange Counties, New York—commuters primarily transfer rather than enter the station from the street. Hoboken Terminal is an important transfer point between PATH and NJ TRANSIT, where the increase in ridership would be fairly evenly split between the two services). At Newark Penn Station, a major hub and transfer station for NJ TRANSIT train and bus service and PATH, the CBD Tolling Alternative would also add a projected 148 new passengers for PATH and 181 passengers for NJ TRANSIT.

The increases at each of these hubs also include a substantial transfer volume. Of the 23 stations where the new passengers resulting from the CBD Tolling Alternative would exceed the screening threshold within New York City, nearly two-thirds are within the Manhattan CBD (Figure 4C-7). In addition, four stations are in Queens, two are in Brooklyn, and two are in Upper Manhattan/the Bronx (Table 4C-27). At some of these stations, planned or programmed improvements independent of the CBD Tolling Alternative will increase station capacity. Measures to be implemented by private developers related to the City of New York's recent rezoning of East Midtown will provide capacity improvements at some East Side subway stations. Other MTA capital improvements are planned at various stations which may alleviate relatively minor ridership increases.

Among those identified to incur incremental trips exceeding the CEQR analysis threshold, the largest increases are expected to occur at the Manhattan CBD's large station complexes. These stations accommodate substantial transfer movements among different subway lines that serve various parts of the city. They also accommodate intermodal transfers, in the case of Grand Central Terminal and Penn Station New York with commuter rail lines, and in the case of Times Square with commuter bus routes that serve the greater metropolitan area.

Table 4C-26. Transit Stations with More than 200 Projected New Passengers in the AM Peak Hour (Tolling Scenario E, 2023)

STATION NAME	OPERATOR	LINE	NO ACTION Ons/Offs	TOLLING SCENARIO E Ons/Offs	NET ONS/OFFS	NET PERCENTAGE CHANGE	LOCATION
New York-Penn Station	LIRR/NJ TRANSIT	—	61,663	63,043	1,380	2.2%	Manhattan CBD
Times Sq-42 St/42 St-Port Authority Bus Terminal	NYCT	Nos. 1, 2, 3, 7, and A, C, E, N, Q, R, S, W	67,299	68,655	790	1.2%	Manhattan CBD
Grand Central-42 St	NYCT	Nos. 4, 5, 6, 7, and S	40,779	41,858	761	1.9%	Manhattan CBD
New York-Grand Central Terminal	Metro-North	—	42,262	43,301	619	1.4%	Manhattan CBD
14 St-Union Square	NYCT	Nos. 4, 5, 6, and L, N, Q, R, W	40,216	41,263	585	1.5%	Manhattan CBD
Secaucus	NJ TRANSIT	—	10,279	10,834	555	5.4%	New Jersey
Hoboken Terminal	NJ TRANSIT	—	10,000	10,501	501	5.0%	New Jersey
Fulton St	NYCT	Nos. 2, 3, 4, 5, and A, C, J, Z	19,681	20,242	495	2.5%	Manhattan CBD
Lexington Av/59 St	NYCT	Nos. 4, 5, 6, and N, R, W	34,441	35,181	455	1.3%	Manhattan CBD
Lexington Av/53 St – 51 St	NYCT	No. 6, and E, M	15,758	16,205	395	2.5%	Manhattan CBD
42 St-Bryant Park-5 Av	NYCT	No. 7, and B, D, F, M	23,759	24,291	342	1.4%	Manhattan CBD
Broadway-Lafayette St and Bleecker St	NYCT	No. 6, and B, D, F, M	25,368	25,991	341	1.3%	Manhattan CBD
Court Square	NYCT	No. 7, and E, G, M	21,824	22,330	332	1.5%	Queens
59 St-Columbus Circle	NYCT	No. 1, and A, B, C, D	36,042	36,727	326	0.9%	Manhattan CBD
34 St-Herald Sq	NYCT	B, D, F, M, N, Q, R, W	30,662	31,230	319	1.0%	Manhattan CBD
Hoboken Terminal (PATH)	PANYNJ	—	7,433	7,749	316	4.2%	New Jersey
Atlantic Av-Barclays Center	NYCT	Nos. 2, 3, 4, 5, and B, Q, D, N, R	34,379	35,016	313	0.9%	Brooklyn
Port Authority Bus Terminal	PANYNJ	—	23,393	23,694	301	1.3%	Manhattan CBD
14 St (Sixth Av/Seventh Av)	NYCT	No. 1, 2, 3, and F, M, L	18,085	18,476	268	1.5%	Manhattan CBD
World Trade Center Station	PANYNJ	—	20,864	21,129	264	1.3%	Manhattan CBD
Flushing-Main St	NYCT	No. 7	14,839	15,100	261	1.8%	Queens
Broadway Junction	NYCT	A, C, J, L, Z	20,441	20,888	245	1.2%	Queens
Canal St (6, J, N, Q, R, Z)	NYCT	No. 6, and N, Q, R, W, J, Z	11,000	11,283	230	2.1%	Manhattan CBD
34 St-Penn Station	NYCT	A, C, E	12,321	12,553	213	1.7%	Manhattan CBD

STATION NAME	OPERATOR	LINE	NO ACTION Ons/Offs	TOLLING SCENARIO E Ons/Offs	NET ONS/OFFS	NET PERCENTAGE CHANGE	LOCATION
168 St-Washington Heights	NYCT	No. 1, and A, C	11,155	11,437	204	2.5%	Manhattan
Newark Penn Station	NJ TRANSIT	—	20,390	20,571	181	0.9%	New Jersey
Newark Penn Station (PATH)	PANYNJ	—	9505	9,653	148	1.6%	New Jersey

Source: WSP, Best Practice Model 2021.

Note: All stations with free connections have aggregated volumes. Peak-hour incremental change was calculated as an average 26 percent peak-hour to peak-period ratio in the AM for NYCT subways, PATH trains, and buses; 43 percent peak-hour to peak-period ratio for Metro-North and NJ TRANSIT; and 41 percent peak-hour to peak-period ratio for LIRR. Net ons/offs include subway-to-bus, subway-to-subway, and bus-to-subway transfers and is not a direct calculation of Tolling Scenario E minus No Action Alternative incremental trips.

Table 4C-27. Transit Stations with More than 200 Projected New Passengers in the PM Peak Hour (Tolling Scenario E, 2023)

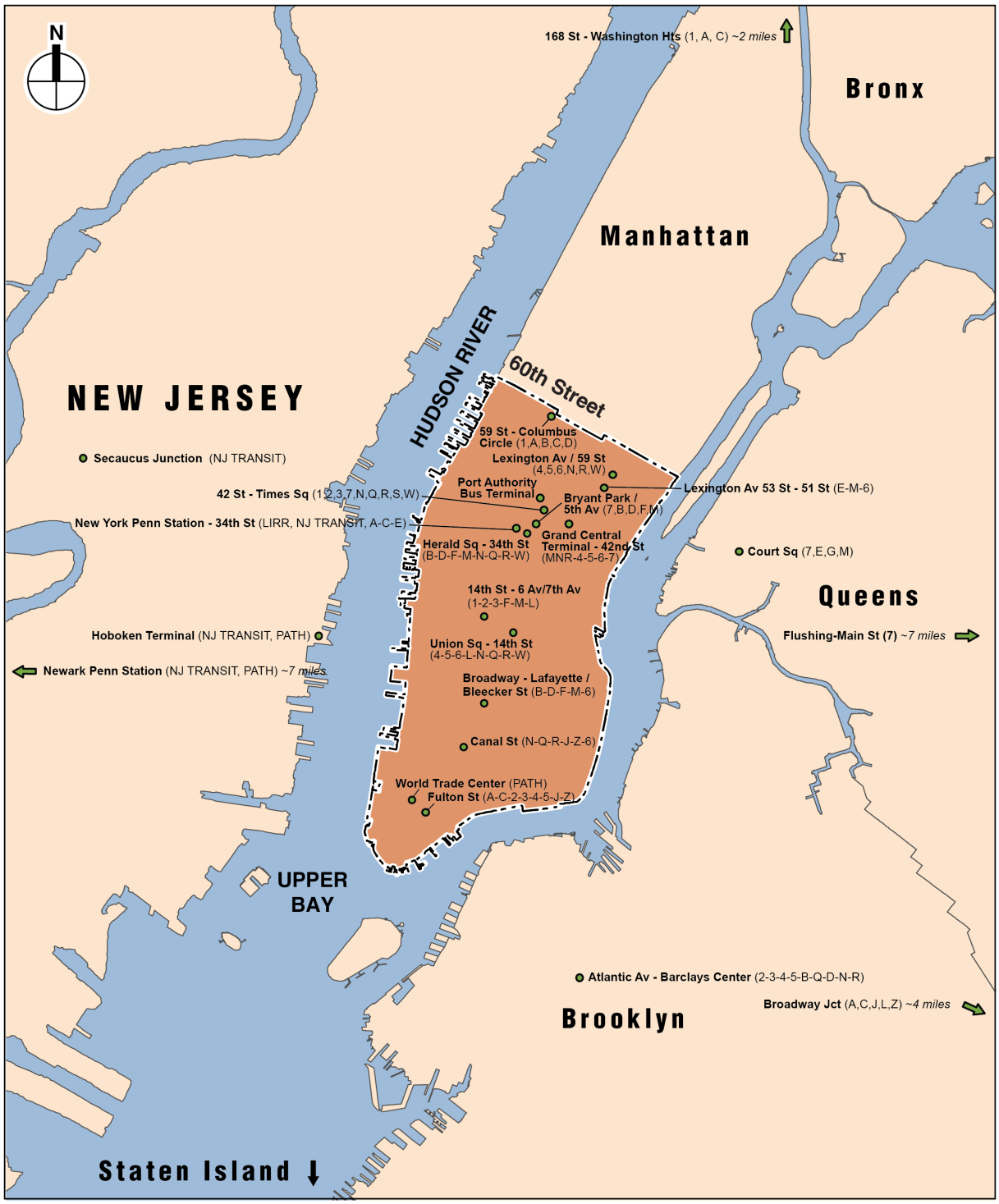
STATION NAME	OPERATOR	LINE	NO ACTION Ons/Offs	TOLLING SCENARIO E Ons/Offs	NET ONS/OFFS	NET PERCENTAGE CHANGE	LOCATION
New York-Penn Station	LIRR/NJ TRANSIT	—	61,663	63,043	1,380	2.2%	Manhattan CBD
Times Sq-42 St/42 St-Port Authority Bus Terminal	NYCT	Nos. 1, 2, 3, 7 and A, C, E, N, Q, R, S, W	72,476	73,936	851	1.2%	Manhattan CBD
Grand Central-42 St	NYCT	Nos. 4, 5, 6, 7 and S	43,916	45,078	820	1.8%	Manhattan CBD
14 St-Union Square	NYCT	Nos. 4, 5, 6, and L, N, Q, R, W	43,309	44,437	630	1.4%	Manhattan CBD
Grand Central Terminal	Metro-North	—	42,682	43,301	619	1.4%	Manhattan CBD
Secaucus	NJ TRANSIT	—	10,279	10,834	555	5.4%	New Jersey
Fulton St	NYCT	Nos. 2, 3, 4, 5, and A, C, J, Z	21,195	21,799	533	2.4%	Manhattan CBD
Hoboken	NJ TRANSIT	—	10,000	10,501	501	5.0%	New Jersey
Lexington Ave/59 St	NYCT	Nos. 4, 5, 6, and N, R, W	37,090	37,888	490	1.3%	Manhattan CBD
Lexington Av/53 St and 51 St	NYCT	No. 6, and E, M	16,970	17,452	425	2.4%	Manhattan CBD
42 St-Bryant Park-5 Av	NYCT	No. 7, and B, D, F, M	25,587	26,160	369	1.4%	Manhattan CBD
Broadway-Lafayette St and Bleecker St	NYCT	No. 6, and B, D, F, M	27,319	27,990	368	1.3%	Manhattan CBD
Court Square	NYCT	No. 7, and E, G, M	23,503	24,048	354	1.5%	Queens
59 St-Columbus Circle	NYCT	No. 1, and A, B, C, D	38,814	39,552	351	0.9%	Manhattan CBD
Hoboken Terminal (PATH)	PANYNJ	—	8,005	8,345	340	4.2%	New Jersey
Atlantic Av-Barclays Center	NYCT	Nos. 2, 3, 4, 5, and B, Q, D, N, R	37,024	37,710	338	0.9%	Brooklyn
34 St-Herald Sq	NYCT	B, D, F, M, N, Q, R, W	33,021	33,632	344	1.0%	Manhattan CBD
Port Authority Bus Terminal	PANYNJ	—	25,192	25,517	325	1.3%	Manhattan CBD
14 St (Sixth Av/Seventh Av)	NYCT	Nos. 1, 2, 3, and F, M, L	19,476	19,898	288	1.5%	Manhattan CBD
World Trade Center Station	PANYNJ	—	22,469	22,754	285	1.3%	Manhattan CBD
Flushing-Main St	NYCT	7	15,980	16,262	281	1.8%	Queens
Broadway Junction	NYCT	A, C, J, Z	22,013	22,494	264	1.2%	Queens
Canal St	NYCT	No. 6, and N, Q, R, W, J	11,846	12,151	247	2.0%	Manhattan CBD
34 St-Penn Station	NYCT	A, C, E	13,268	13,519	229	1.7%	Manhattan CBD

STATION NAME	OPERATOR	LINE	NO ACTION Ons/Offs	TOLLING SCENARIO E Ons/Offs	NET ONS/OFFS	NET PERCENTAGE CHANGE	LOCATION
168 St-Washington Heights	NYCT	No. 1, and A, C	12,013	12,317	219	1.8%	Manhattan
Newark Penn Station	NJ TRANSIT	—	20,390	20,571	181	0.9%	New Jersey
Newark Penn Station	PANYNJ	—	10,236	10,396	160	2.0%	New Jersey

Source: WSP, Best Practice Model 2021.

Note: All stations with free connections have aggregated volumes. Peak-hour incremental change was calculated as an average 28 percent peak-hour to peak-period ratio in the PM for NYCT subways, PATH trains, and buses; 43 percent peak-hour to peak-period ratio for Metro-North and NJ TRANSIT; and 41 percent peak-hour to peak-period ratio for LIRR. Net ons/offs include subway-to-bus, subway-to-subway, and bus-to-subway transfers and is not a direct calculation of Tolling Scenario E minus No Action Alternative incremental trips.

Figure 4C-7. Transit Stations Identified for Detailed Station Analysis (2023, Tolling Scenario E – Representative Tolling Scenario)



Source: WSP, Best Practice Model 2021.

Qualitative Analysis of NYC Stations

Some of the stations with over 200 anticipated new passengers due to the Project have large-scale station improvements either recently constructed, being implemented, or in process, which will significantly change circulation patterns and capacity at these stations. Consultation undertaken with NYCT—which took into account these current and/or future station improvements, as well as station size and available access points, existing usage levels, and baseline data availability—concluded that a qualitative evaluation of the stations below is appropriate as the projected incremental trips, in the context of ongoing improvements, would not have the potential to result in adverse effects. For more information, see the methodology for performing qualitative assessments above in Section 4C.2.1.1.

Grand Central Terminal (serving Metro-North) is projected to have a net increase of 619 peak-hour passengers under Tolling Scenario E, which constitutes a 1.4 percent increase in Metro-North ridership at this East Midtown hub (see Table 4C-27). Additionally, the 42nd St–Grand Central subway station is projected to see a net increase of 761 peak-hour passengers under Tolling Scenario E. About two-thirds of these are the Nos. 4/5/6 line passengers, followed by about 30 percent of passengers using the No. 7 train. The remaining 5 percent are passengers using the 42nd Street Shuttle (S).

Several improvements have recently been completed at the Grand Central Terminal commuter rail and subway stations. Over the years, the North End Access project has provided Metro-North commuter rail passengers at Grand Central Terminal with more direct access to destinations north of the Terminal, and additional access points are planned for future development sites. The anticipated completion of the East Side Access project will provide a new LIRR connection to the East Side with a new concourse below the existing Terminal and the new One Vanderbilt development. The 42 Street Connection Project, completed in 2021, has added capacity to several stairs between the terminal and subway and between the subway and street, along with additional turnstiles and platform area serving the 42nd Street Shuttle (S), and modernized the escalators and elevator. Other than the escalator and elevator work, these changes will improve transfer moves, which are the largest portion of the projected increment for these stations, although they will not increase overall capacity. Similarly, the Lexington Avenue line station that is one stop north of Grand Central Station—the Lexington Av/53 St–51 St Station—is expected to undergo substantial improvements as part of the on-going build-out of the Greater East Midtown Rezoning initiatives. This station, which is projected to incur a net increase of 395 peak-hour passengers under Scenario E, spans three city blocks linking two separate station complexes (i.e., 51st St [No. 6 train] and Lexington Av–53 St [E/M trains]).

Accordingly, the projected incremental trips would be dispersed across a large number of station elements, many of which will undergo substantial improvements. Hence, in consultation with NYCT, quantitative analyses of the Grand Central commuter rail terminal and subway station, as well as the Lexington Av–53 St/51st St Station, were determined to be not warranted. Considering the improvements that would be in place and which were designed to improve existing operations and accommodate future growth, the projected increments from the Project, dispersed across this station, would not be expected to have the potential to result in adverse effects.

The **PABT** is projected to see a net increase of 301 passengers in the AM peak hour, which is an increase of 1.3 percent. AM peak period ridership of the PABT was 84,000 in 2015 according to the Continuous Bus Study, roughly 26 percent of which (21,840) occurred during the AM peak hour. Because the projected increments would be distributed across a large transit complex, including a portion captured in the Times Square Station analyses, a quantitative analysis of the bus terminal (which is not expected to show material differences between future no action and with action conditions) was determined to not be warranted. The CBD Tolling Alternative is, hence, not expected to result in adverse effects on circulation elements within this facility.

Under Tolling Scenario E, the **Penn Station New York** (LIRR, NJ TRANSIT, Amtrak) Station is projected to experience a net increase of 1,380 passengers (a 2.2 percent increase) and the **34 St-Penn Station** (Eighth Avenue A, C, E lines) a net increase of 213 passengers (a 1.9 percent increase). The **34 St–Herald Square** Station is projected to see an increase of 319 passengers (a 1.9 percent increase). The 34 St-Penn Station (Seventh Avenue 1, 2, 3 lines) is not projected to experience a net increase of over 200 passengers.

- With respect to Penn Station New York and 34-Penn Station, according to the April 2021 Penn Station Master Plan, https://new.mta.info/document/37416 , daily Penn Station ridership was approximately 600,000 in 2019.[34] Roughly 30 percent of that ridership occurred in the AM peak period (180,000), and 26 percent of AM peak ridership (40,680) occurred during the AM peak hour. Considering the expansiveness of Penn Station New York and its adjacent subway stations, as well as the recently completed Moynihan Station, the incremental pedestrian trips would be dispersed across a myriad of different pedestrian paths and a large number of station circulation elements, and would not be perceptible to those already using the station.
- At 34 St – Herald Square Station, turnstile data shows daily ridership of approximately 250,000 in October 2019.[35] Roughly 30 percent of that ridership occurred in the AM peak period (75,000), and 26 percent of AM peak ridership (19,500) occurred during the AM peak hour. The under 400 incremental passengers would traverse a large network of street-level entrances and underground passageways extending from West 32nd to West 35th Streets across Broadway and Sixth Avenue.
- Accordingly, incremental ridership increases from the Project are unlikely to result in perceptible changes to operations at these transit facilities. Hence, in consultation with NYCT, quantitative analyses of the Penn Station New York commuter rail terminal and the adjacent/adjoining 34th Street subway stations were determined to be not required, and the Project is not expected to result in adverse effects on circulation elements within these facilities.

[34] 39 percent LIRR (237,000); 31 percent NJ TRANSIT (187,000); 24 percent subway and others, including local office workers and others patronizing in station retail (142,000) and 6 percent Amtrak (34,000). April 2021 Penn Station Master Plan. https://new.mta.info/document/37416.

[35] MTA Turnstile data. http://web.mta.info/developers/turnstile.html.

Fulton Street Station is projected to see an increase of 560 passengers in the AM peak hour, which is a 2.8 percent increase relative to the station's No Action Alternative ridership. The incremental number of passengers among the A/C, Nos. 2/3, and Nos. 4/5 lines are comparable, with the highest projected volumes on the A/C lines. Access to these lines is made via many station entrances spanning several city blocks east–west and north–south. Additionally, all lines within this station are connected via underground passageways; therefore, the projected increments would be well distributed across many station elements, such that the increase in trips at any individual station element is likely to be imperceptible. Moreover, the Fulton Street Transit Center renovations, completed in 2014, which included additional stair capacity off each platform, opening of new entrances, and reconstruction of upper mezzanine areas that improved ease of transfers within the station, provided additional capacity to accommodate future growth in ridership. Accordingly, in consultation with NYCT, a quantitative analysis was determined to be not required, and the Project is not expected to result in adverse effects at this station.

Quantitative Analysis of Stations

For the remaining stations, a quantitative station analysis was conducted at 18 transit stations: 13 NYCT stations, 2 NJ TRANSIT stations, and 3 PATH stations (operated by PANYNJ).

Quantitative Analysis of Transit Stations – NYCT Stations

An analysis of existing AM and PM peak-hour service levels at station elements was prepared to describe the operating conditions of the 13 stations and identify station elements that are already operating near capacity or at congested levels. These study locations were selected in coordination with NYCT. For each station's selected analysis locations, NYCT was consulted on the appropriate application of friction and surge factors and the analyses were prepared in accordance with the guidance presented in the *CEQR Technical Manual*. As summarized in Table 4C-29 and Table 4C-30, approximately 15 percent of the station elements (86 in the AM peak hour and 81 in the PM peak hour out of 564 station elements) analyzed for the 13 stations currently operate at or above capacity, at level of service (LOS) D or worse. The detailed analysis results described above are presented in Appendix 4C-7, "Transportation: Level of Service Tables – New York City" and Appendix 4C-8, "Transportation: Level of Service Tables – NJ TRANSIT and PATH Stations."

For the No Action Alternative, no additional background growth was applied on top of 2019 ridership levels since the existing condition incorporates a return to pre-COVID-19 pandemic transit ridership. According to an analysis by McKinsey & Company, commissioned by MTA, ridership may reach 80 percent to 92 percent of pre-pandemic levels by end of 2024.[36] As summarized in Table 4C-31 and Table 4C-32, approximately 14 percent to 15 percent of the station elements (86 in the AM peak hour and 81 in the PM peak hour out of 563 station elements) analyzed for the 13 stations would operate at or above capacity, at LOS D or worse.

[36] MTA 2021 Budget and 2021–2024 Financial Plan Adoption Materials. MTA Finance Committee/MTA Board. December 16, 2020. https://new.mta.info/document/25291.

Table 4C-28. Existing Conditions Level of Service for Analyzed Stations Elements (2019 AM Peak Hour)

STATION	COUNT OF VERTICAL CIRCULATION ELEMENTS				COUNT OF FARE CONTROL AREA ELEMENTS			
	LOS A, B, C	LOS D	LOS E	LOS F	LOS A, B, C	LOS D	LOS E	LOS F
14 St-Union Square	27	9	2	6	12	0	0	0
42 St-Times Square/PABT	51	6	11	4	17	0	0	0
42 St-Bryant Park/Fifth Av	29	4	3	1	9	0	0	0
Bleecker St-Broadway/Lafayette St	28	0	0	1	10	0	0	0
Atlantic Av-Barclays Center	16	1	1	0	8	0	0	0
14 St-Sixth/Seventh Av	59	2	1	1	16	0	0	0
Flushing-Main St	10	4	1	3	3	0	0	0
Canal St (N, Q, R, W, J, Z, 6)	30	2	1	0	9	0	0	0
168 St-Washington Heights	31	0	1	0	4	0	0	0
59 St-Columbus Circle	25	2	0	0	7	0	0	0
Broadway Junction	10	4	1	0	1	0	0	0
Court Square	24	0	2	1	8	0	0	0
Lexington Av/59 St	24	5	2	4	10	0	0	0

Source: Analysis prepared by AKRF, FHI Studio, and WSP.

Table 4C-29. Existing Conditions Level of Service for Analyzed Station Elements (2019 PM Peak Hour)

STATION	COUNT OF VERTICAL CIRCULATION ELEMENTS				COUNT OF FARE CONTROL AREA ELEMENTS			
	LOS A, B, C	LOS D	LOS E	LOS F	LOS A, B, C	LOS D	LOS E	LOS F
14 St-Union Square	27	10	3	4	12	0	0	0
42 St-Times Square/PABT	49	10	10	3	17	0	0	0
42 St-Bryant Park/Fifth Av	31	4	0	2	9	0	0	0
Bleecker St-Broadway/Lafayette St	24	4	0	1	10	0	0	0
Atlantic Av-Barclays Center	13	5	0	0	8	0	0	0
14 St-Sixth/Seventh Av	60	3	0	0	16	0	0	0
Flushing-Main St	13	2	2	1	3	0	0	0
Canal St (N, Q, R, W, J, Z, 6)	31	2	0	0	9	0	0	0
168 St-Washington Heights	31	1	0	0	4	0	0	0
59 St-Columbus Circle	26	1	0	0	7	0	0	0
Broadway Junction	13	2	0	0	1	0	0	0
Court Square	26	1	0	0	8	0	0	0
Lexington Av/59 St	25	4	2	4	10	0	0	0

Source: Analysis prepared by AKRF, FHI Studio, and WSP.

Table 4C-30. No Action Alternative Level of Service for Analyzed Station Elements (2023 AM Peak Hour)

STATION	COUNT OF VERTICAL CIRCULATION ELEMENTS				COUNT OF FARE CONTROL AREA ELEMENTS			
	LOS A, B, C	LOS D	LOS E	LOS F	LOS A, B, C	LOS D	LOS E	LOS F
14 St-Union Square	27	9	2	6	12	0	0	0
42 St-Times Square/PABT	51	6	11	4	16	0	0	0
42 St-Bryant Park/Fifth Av	29	4	3	1	9	0	0	0
Bleecker St-Broadway/Lafayette St	28	0	0	1	10	0	0	0
Atlantic Av-Barclays Center	16	1	1	0	8	0	0	0
14 St-Sixth/Seventh Av	59	2	1	1	16	0	0	0
Flushing-Main St	10	4	1	3	3	0	0	0
Canal St (N, Q, R, W, J, Z, 6)	30	2	1	0	9	0	0	0
168 St-Washington Heights	31	0	1	0	4	0	0	0
59 St-Columbus Circle	25	2	0	0	7	0	0	0
Broadway Junction	10	4	1	0	1	0	0	0
Court Square	24	0	2	1	8	0	0	0
Lexington Av/59 St	24	5	2	4	10	0	0	0

Source: Analysis prepared by AKRF, FHI Studio, and WSP.

Table 4C-31. No Action Alternative Level of Service for Analyzed Station Elements (2023 PM Peak Hour)

STATION	COUNT OF VERTICAL CIRCULATION ELEMENTS				COUNT OF FARE CONTROL AREA ELEMENTS			
	LOS A, B, C	LOS D	LOS E	LOS F	LOS A, B, C	LOS D	LOS E	LOS F
14 St-Union Square	27	10	3	4	12	0	0	0
42 St-Times Square/PABT	49	10	10	3	16	0	0	0
42 St-Bryant Park/Fifth Av	31	4	0	2	9	0	0	0
Bleecker St-Broadway/Lafayette St	24	4	0	1	10	0	0	0
Atlantic Av-Barclays Center	13	5	0	0	8	0	0	0
14 St-Sixth/Seventh Av	60	3	0	0	16	0	0	0
Flushing-Main St	13	2	2	1	3	0	0	0
Canal St (N, Q, R, W, J, Z, 6)	31	2	0	0	9	0	0	0
168 St-Washington Heights	31	1	0	0	4	0	0	0
59 St-Columbus Circle	26	1	0	0	7	0	0	0
Broadway Junction	13	2	0	0	1	0	0	0
Court Square	26	1	0	0	8	0	0	0
Lexington Av/59 St	25	4	2	4	10	0	0	0

Source: Analysis prepared by AKRF, FHI Studio, and WSP.

As described above, the implementation of the Project would result in measurable increases in subway trips at the 13 analyzed subway stations and the analyses presented in this subchapter depict conditions under the representative tolling scenario with the highest level of incremental ridership increases for subway operations. These increments were used in the station trip assignments described above and overlaid onto the station analysis elements for the quantitative analyses. As summarized in **Table 4C-33 and Table 4C-34**, approximately 15 percent to 16 percent of the station elements (88 in the AM peak hour and 85 in the PM peak hour out of 563 station elements) analyzed for the 13 stations would operate at or above capacity, at LOS D or worse, for Tolling Scenario E.

Table 4C-32. CBD Tolling Alternative Level of Service for Analyzed Station Elements (2023 AM Peak Hour)

STATION	COUNT OF VERTICAL CIRCULATION ELEMENTS				COUNT OF FARE CONTROL AREA ELEMENTS			
	LOS A, B, C	LOS D	LOS E	LOS F	LOS A, B, C	LOS D	LOS E	LOS F
14 St-Union Square	26	9	3	6	12	0	0	0
42 St-Times Square/PABT	50	6	11	5	16	0	0	0
42 St-Bryant Park/Fifth Av	29	4	3	1	9	0	0	0
Bleecker St-Broadway/Lafayette St	28	0	1	0	10	0	0	0
Atlantic Av-Barclays Center	16	1	0	1	8	0	0	0
14 St-Sixth/Seventh Av	59	1	2	1	16	0	0	0
Flushing-Main St	10	4	1	3	3	0	0	0
Canal St (N, Q, R, W, J, Z, and No. 6)	30	2	1	0	9	0	0	0
168 St-Washington Heights	31	0	1	0	4	0	0	0
59 St-Columbus Circle	25	2	0	0	7	0	0	0
Broadway Junction	10	4	1	0	1	0	0	0
Court Square	24	0	2	1	8	0	0	0
Lexington Av/59 St	24	5	2	4	10	0	0	0

Source: Analysis prepared by AKRF, FHI Studio, and WSP.

Table 4C-33. CBD Tolling Alternative Level of Service for Analyzed Station Elements (2023 PM Peak Hour)

STATION	COUNT OF VERTICAL CIRCULATION ELEMENTS				COUNT OF FARE CONTROL AREA ELEMENTS			
	LOS A, B, C	LOS D	LOS E	LOS F	LOS A, B, C	LOS D	LOS E	LOS F
14 St-Union Square	27	9	4	4	12	0	0	0
42 St-Times Square/PABT	48	10	10	4	16	0	0	0
42 St-Bryant Park/Fifth Av	31	4	0	2	9	0	0	0
Bleecker St-Broadway/Lafayette St	24	4	0	1	10	0	0	0
Atlantic Av-Barclays Center	13	5	0	0	8	0	0	0
14 St-Sixth/Seventh Av	60	2	1	0	16	0	0	0
Flushing-Main St	12	3	2	1	3	0	0	0
Canal St (N, Q, R, W, J, Z, and No. 6)	31	2	0	0	9	0	0	0
168 St-Washington Heights	31	1	0	0	4	0	0	0
59 St-Columbus Circle	26	1	0	0	7	0	0	0
Broadway Junction	13	2	0	0	1	0	0	0
Court Square	25	1	1	0	8	0	0	0
Lexington Av/59 St	24	4	3	4	10	0	0	0

Source: Analysis prepared by AKRF, FHI Studio, and WSP.

Based on criteria prescribed in the *CEQR Technical Manual*, without Project improvements, potential adverse effects were predicted at 4 VCEs and no FCAs across the 13 analyzed stations for the representative tolling scenario (Table 4C-35). Comparing projected ridership increases across various tolling scenarios, it is anticipated that some tolling scenarios may have relatively less potential for potential adverse effects (further described below). At stations where adverse effects are anticipated monitoring will be undertaken and the following mitigation measures will be pursued should they be needed:

- Times Square Station (PM only)
  - *VCE:* Interborough Rapid Transit (IRT) Mezzanine Level (ML) Stair 6/8 (Stair ML6/ML8) – stairway connecting IRT mezzanine to uptown Nos. 1, 2, 3 subway platform. The adverse effects identified for the Stair ML6/ML8 will be avoided or relieved by removing the center handrail and standardizing the riser, so that the stair meets code without the handrail. (NYCT has confirmed code compliance.) Implementing this mitigation measure will improve the PM peak-hour conditions from LOS F (with a v/c ratio of 1.70) to LOS E (with a v/c ratio of 1.64) and avoid the predicted potential adverse effect. Upon monitoring and evaluation of ridership at this station, TBTA will coordinate with MTA to construct this improvement if the projected ridership materializes.

Table 4C-34. NYCT Station Elements Where Adverse Effects and Accompanying Project Improvements Have Been Identified (CBD Tolling Alternative, 2023 AM/PM Peak Hour)

STATION	ELEMENT	ELEMENT DESCRIPTION	PEAK HOUR OF CONCERN	NO ACTION ALTERNATIVE			CBD TOLLING ALTERNATIVE			IDENTIFIED IMPROVEMENT
				Peak-Hour Volume	V/C Ratio	Level of Service	Peak-Hour Volume	V/C Ratio	Level of Service	
42 St-Times Sq/PABT	IRT ML6/ML8	Stairway connecting IRT mezzanine to uptown Nos. 1, 2, and 3 subway platform	PM	4,680	1.65	E	3,802	1.70	F	Remove center hand rail and standardize the riser.
Flushing – Main St	E456	Street escalator at north side of Roosevelt Avenue between Main Street and Union Street	AM	2,984	1.18	D	3,040	1.21	D	Increase escalator speed to 120 feet per minute.
Union Sq	E219	Escalator connecting the Canarsie line platform to the IRT mezzanine	AM	2,496	1.26	D	2,519	1.27	D	Increase escalator speed to 120 feet per minute.
Court Sq	Flushing P2/P4	Stair between paid zone and Manhattan-bound No. 7 train	AM	3,825	1.84	F	3,955	1.90	F	Construct new stair from the northern end of the No. 7 platform to the street.

Source: Analysis prepared by AKRF, FHI Studio, and WSP.

- Flushing-Main Street Station (AM only)
  - VCE: Escalator 456 (E456) – located on the east side of the station providing access from the street to the mezzanine. The E456 escalator, which was replaced and operates at a speed of 100 feet per minute (fpm), can be safely operated at 120 fpm. (NYCT has confirmed code compliance). Without the improvement, this escalator would operate at LOS D (with a v/c ratio of 1.21). Implementing this operational change will improve the forecast AM peak-hour condition) to LOS D (with a v/c ratio of 1.08) and avoid the predicted potential adverse effect. Upon monitoring and evaluation of ridership at this station, TBTA will coordinate with MTA to implement this improvement if the projected ridership materializes.
- 14 St - Union Square Station (AM only)
  - VCE: Escalator 219 (E219) – connecting the Canarsie line platform to the IRT mezzanine. The E219 escalator, which was installed in 2020 and operates at a speed of 100 fpm, can be safely operated at 120 fpm. (NYCT has confirmed code compliance). Without the improvement, this escalator would operate at LOS D (with a v/c ratio of 1.27). With the implementation of this operational change, the forecast AM peak-hour condition will be improved to LOS D (with a ratio of 1.15) and avoid the predicted potential adverse effect. Upon monitoring and evaluation of ridership at this station, TBTA will coordinate with MTA to implement this improvement if the projected ridership materializes.
- Court Square Station (AM only)
  - VCE: Flushing Platform Stair 2/4 (Stair P2/P4) Stair – accessing Manhattan-bound No. 7 train. The adverse effects identified for this stairway will be mitigated by building a new stair from the northern end of the No. 7 platform to the street, along with a new fare control area. Doing so will distribute pedestrian flow away from Stair P2/P4. Implementation of this mitigation measure would improve the AM peak-hour conditions from LOS F, with a v/c ratio of 1.90, to LOS E, with a v/c ratio of 1.56 and avoid the predicted potential adverse effect. The improvement (the new stair and fare control area) is listed in the Special Long Island City Mixed Use District, Court Square Subdistrict, administered by the New York City Department of City Planning (NYCDCP). The Subdistrict language assigns transit improvement projects to projected developments on three blocks—this improvement is tied to a site on the southernmost block, which is on the east side of 23rd Street between 45th Road and 45th Avenue, Queens, New York. NYCT maintains ongoing coordination with NYCDCP about potential qualifying developments within the Subdistrict, and MTA approval for the design of the subway improvement and certification by the Chairperson of the City Planning Commission are both required. Thus, it is possible that this mitigation will be built by an outside developer in coordination with NYCT before the impact occurs. Upon monitoring of ridership at this station, if the projected ridership is anticipated to materialize and this station improvement has not been constructed via outside developers, or if construction by an outside developer is not likely in the foreseeable future from when the impact is triggered, TBTA will coordinate with NYCT to construct this new stair. The monitoring plan will allow for sufficient time to implement the mitigation to ensure that the adverse effect does not occur.

Implementation of the potential stairway and escalator improvements at 42nd Street-Times Square/PABT, Main Street-Flushing, Court Square, and 14th Street-Union Square Stations have been reviewed by NYCT for feasibility and will be further coordinated and finalized through NYCT, in compliance with requirements under the Americans with Disabilities Act.

In contrasting the projected increases in passenger volumes among the various tolling scenarios, it can be expected that Tolling Scenarios D and F would yield the same or comparable adverse effects that could be addressed with the same Project improvements identified for the representative tolling scenario. While these adverse effects and need for Project improvements may also materialize for Tolling Scenarios A, B, C, and G, the severity of the adverse effects and extent of Project improvements needed is likely to be relatively less than the other three tolling scenarios (D, E, and F) and varies by station element as a function of projected net passenger increase at the station. Nevertheless, to ensure the Project does not create an adverse effect at any of the four NYCT station elements described above, monitoring at all four NYCT station elements will be undertaken regardless of the tolling scenario selected. Monitoring of actual conditions before and after Project implementation will determine if the potential Project mitigation measures identified are warranted for implementation.

The operating agencies will monitor changes in ***[passenger volumes at the specific station elements in]*** the first year after implementation of the Project. The changes in ***[passenger volumes]*** will be used in accordance with the thresholds defined by the *CEQR Technical Manual* to determine whether forecast adverse effects at specific station elements would materialize and whether improvement strategies—which, if implemented, would achieve an adequate level of improvement to avoid the predicted adverse effects—should be pursued.

[Design and resource allocation will begin immediately after the passenger volume threshold is exceeded (or if already exceeded, as soon as practicable), and the mitigation measures will be implemented prior to overall ridership at the station exceeding 90 percent of 2019 levels.] Because some of these strategies are likely to require additional planning, design, and construction, it is possible that short-term, adverse effects may occur while these improvements are being designed and constructed. The operating agencies will also advance planning and design efforts subsequent to approval of the Project to expedite the implementation of improvement strategies if they are deemed warranted by the above monitoring efforts.

Detailed Analysis of Transit Stations – NJ TRANSIT Stations

Analyses of stations for NJ TRANSIT were performed using CEQR guidelines for consistency and because NJ TRANSIT does not have an alternative guideline. Two NJ TRANSIT stations, Secaucus Junction and Hoboken Terminal, would meet the CEQR criteria for detailed analysis with 200 or more Project-generated trips in a peak hour with Tolling Scenario E, the representative tolling scenario for transit analyses. In addition, Newark Penn Station would experience an increase of more than 200 peak-hour trips with Tolling Scenario C.

At Hoboken Terminal and Newark, the connected PATH stations would also experience increases of more than 200 peak-hour trips, and in those cases, most of the increase consists of transfers between NJ TRANSIT rail and PATH trains.

NJ TRANSIT trains at Hoboken Terminal are distributed to 17 tracks which are accessed via nine at-grade platforms. The platforms are accessed directly from an at-grade concourse at the south end of the tracks and at-grade platforms without any requirement for vertical circulation. Therefore, NJ TRANSIT areas of the station do not contain many capacity constrained pedestrian elements (such as stairs or escalators). As Project-generated passengers would be widely dispersed in the terminal and there are no VCEs in the NJ TRANSIT area, no further analysis was performed for the NJ TRANSIT areas of Hoboken Terminal. (Analysis of PATH station elements at Hoboken Terminal is discussed below.)

For the Secaucus Junction and Newark Penn Station, Project-generated incremental pedestrian volumes were assigned to VCEs along likely paths of travel. Detailed analysis was conducted for elements that are projected to see an increase of 100 or more people in the AM or PM peak hour, because it was deemed unlikely that elements with smaller incremental increases would experience an adverse effect from the Project. This threshold was borne out by the analysis because the elements that exceeded the 100-person threshold also did not experience significant adverse effects.

BPM model outputs indicate that most Project-generated trips at Secaucus Junction would be transferring from eastbound Main Line trains to eastbound Northeast Corridor trains in the morning and the reverse direction in the evening, with a small number also transferring between buses and Northeast Corridor trains. While passengers making these connections are distributed to multiple stairs and escalators, there would be a concentration of activity on the three escalators to the platform serving Northeast Corridor Tracks A and B just north of the fare control area at the mezzanine level. Analysis was also conducted for the next set of stairs and escalators to Tracks 2, A, B, and 3 north of the fare control area.

At Newark Penn Station, most Project-generated trips would be transferring from eastbound NJ TRANSIT trains to eastbound PATH trains in the morning and the reverse direction in the evening. In the morning, these transfers would be primarily cross-platform from Tracks 1 and 2 to the eastbound PATH platform without using any vertical circulation. The small number who would transfer from Track A to PATH would use vertical circulation but would result in very small incremental volumes on those elements. During the evening, most Project-generated trips would transfer from the arriving PATH platform H down a ramp to the platform serving Tracks 3 and 4. A smaller number of passengers would transfer down another ramp to the platform serving Track 5. An analysis was conducted of the ramp to Platforms 3 and 4 in the PM peak period only.

For the No Action Alternative, no growth factor was applied because the baseline conditions incorporate a return to pre-COVID-19 pandemic transit ridership. Therefore, levels of service are the same in the existing condition and No Action Alternative.

The LOS on the ramp analyzed at Newark Penn Station (Table 4C-36), would continue to operate at LOS A with the Project. Of the eight elements analyzed at Secaucus Junction, one escalator and one stair would decline from LOS A to LOS C with the proposed action. However, based on criteria prescribed in the *CEQR Technical Manual*, no significant adverse effects were predicted at the NJ TRANSIT stations.

Table 4C-35. Level of Service on NJ TRANSIT Station Elements (Peak Hour)

STATION/ELEMENT	EXISTING (2019)		NO ACTION ALTERNATIVE (2023)		CBD TOLLING ALTERNATIVE (2023)	
	AM	PM	AM	PM	AM	PM
Newark, Ramp to Tracks 3 and 4	N/A	A	N/A	A	N/A	A
Secaucus, Escalator 1a to Platform A/B	A	A	A	A	B	A
Secaucus, Escalator 1b to Platform A/B	A	A	A	A	C	A
Secaucus, Escalator 1c to Platform A/B	B	A	B	A	B	A
Secaucus, Stair 2a to Platform 3	A	N/A	A	N/A	A	N/A
Secaucus, Escalator 2b to Platform 3	A	N/A	A	N/A	A	N/A
Secaucus, Stair 3 to Platform A/B	A	A	A	A	C	C
Secaucus, Stair 4a to Platform 2	N/A	A	N/A	A	N/A	A
Secaucus, Escalator 4b to Platform 2	N/A	A	N/A	A	N/A	A

Source: Analysis prepared by AKRF, FHI Studio, and WSP.
Note: N/A = Not applicable

Detailed Analysis of Transit Station – PATH Stations

Analyses of stations for PATH were performed using CEQR guidelines for consistency and because PANYNJ does not have an alternative guideline. Three PATH stations—World Trade Center, Newark Penn Station, and Hoboken Terminal—would meet the CEQR criteria for detailed analysis with 200 or more Project-generated trips in a peak hour with Tolling Scenario E. At Hoboken and Newark, most of the Project-generated increase consists of transfers between PATH and NJ TRANSIT trains.

The PATH World Trade Center Station consists of five tracks accessed from four platforms. Each of the platforms is accessed by multiple stairs and escalators in relatively close proximity. Distribution of Project-generated passengers to the various elements results in low incremental volumes on each element. Due to the number of platforms and circulation elements, no individual circulation element would receive more than 100 new trips in a peak hour. Based on distribution and low incremental volumes added to individual elements, more detailed analysis was not performed for circulation elements in the station.

At Newark Penn Station, originating PATH trains depart eastbound on a track that is at the same level as the NJ TRANSIT rail tracks. Departing trains are accessible from platforms on both sides of this track, which are directly accessible from the platforms serving NJ TRANSIT Tracks 1 and 2. PATH trains arrive and terminate westbound at a track on the upper level. Access to both PATH platforms is provided via stairs, escalators, and two ramps that are in the NJ TRANSIT controlled areas of the station and were addressed by the analysis for those areas, described above.

The PATH Hoboken Station is connected to the Hoboken Terminal NJ TRANSIT trains by two stairs located within the Terminal building and two smaller stairs located just outside the north wall of the Terminal. Most passengers transferring between PATH and NJ TRANSIT use the two inside stairs due to their larger size and visibility from within the terminal or the PATH station. The PATH station also has two stairs on the north side of the station providing access to Hudson Place and the Hoboken community.

Project-generated trips were assigned to the two key stairs providing connection to Hoboken Terminal, street stairs serving the community, and additional stairs that connect a mezzanine level to each of the

three platforms. Although only Stair 01/02, connecting the PATH station to Hoboken Terminal, would experience more than 100 Project-generated trips during either peak hour, a detailed analysis was performed both for that Stair 01/02 and Stair 05, which also connects to the terminal. Table 4C-37 indicates existing, No Action Alternative, and CBD Tolling Alternative LOS on the two stairs analyzed at the PATH Hoboken Station.

Table 4C-36. Level of Service on PATH Hoboken Station Elements (AM and PM Peak Hours)

STATION/ELEMENT	EXISTING (2019)		NO ACTION ALTERNATIVE (2023)		CBD TOLLING ALTERNATIVE (2023)	
	AM	PM	AM	PM	AM	PM
Hoboken Stair 01/02	LOS D	LOS D	LOS D	LOS D	LOS E	LOS D
Hoboken Stair 05	LOS A	LOS A	LOS A	LOS A	LOS A	LOS A

Source: Analysis prepared by AKRF, FHI Studio, and WSP.

The implementation of the Project would result in measurable increases in volumes on the various stairs at the PATH Hoboken Station with the representative tolling scenarios. Based on criteria prescribed in the *CEQR Technical Manual*, an adverse effect was predicted during the AM peak hour at Stair 01/02 for Tolling Scenario E, the tolling scenario with the highest projected ridership.

In contrasting the projected increases in passenger volumes among the various tolling scenarios, there could be considerable differences in the projected passenger increases, which could lead to potential adverse effects (Table 4C-38). While Tolling Scenarios E and F (the tolling scenarios with the highest tolls) would yield the passenger increases sufficient to result in adverse effects, Tolling Scenarios A, B, C, D, and G are not predicted to result in adverse effects in this location.

Table 4C-37. Projected Net Passenger Increase at Hoboken Stair 01/02 (All Scenarios, AM Peak Hour)

	TOLLING SCENARIO A	TOLLING SCENARIO B	TOLLING SCENARIO C	TOLLING SCENARIO D	TOLLING SCENARIO E	TOLLING SCENARIO F	TOLLING SCENARIO G
Projected Passenger Increase	45	72	122	164	240	205	139
Determin-ation of Adverse Effect	None	None	None	None	Likely	Likely	None

Source: Analysis prepared by AKRF, FHI Studio, and WSP.

If Tolling Scenario E or F is selected by the TBTA Board, the Project Sponsors will monitor ridership at this station ***[two months]*** after Project implementation to evaluate whether projected ridership has materialized due to the Project. The specific plan for monitoring is being developed in coordination with PANYNJ (PATH) and NJ TRANSIT. As outlined in the plan, if a comparison of Stair 01/02 passenger volumes one month prior and two months after implementation shows an incremental change that is greater than or equal to 205 passengers, the Project Sponsors will continue coordination with PANYNJ (PATH) and NJ TRANSIT to implement improved wayfinding and supplemental temporary personnel to direct passengers if needed. These mitigation measures are expected to improve circulation and more evenly

distribute passengers among the station's stairs, including PATH Stairs 03 and 05. Through consultation and in coordination with NJ TRANSIT and PANYNJ (PATH), if it is determined that the predicted adverse effects on Stair 01/02 would materialize, the committed improvements will be implemented to alleviate the adverse effect.

4C.5 CONCLUSION

Ridership increases resulting from the Project would affect a limited number of subway lines and subway stations within the regional transit system (and no bus or commuter rail lines or stations). Even in the tolling scenarios with the highest incremental ridership increases, the increases in ridership on the transit lines (line-haul capacity) would not be high enough to be considered adverse effects.

The station screening analysis resulted in some forecast increases of over 200 passengers in MTA subway stations and commuter rail hubs connecting to the Manhattan CBD, but most subway stations and all other commuter rail stations are projected to see relatively small increases. Based on criteria prescribed in the *CEQR Technical Manual*, without Project improvements, potential adverse effects were predicted at 4 VCEs and no FCAs across the 13 analyzed NYCT stations; and at 1 VCE and no FCAs across the 4 analyzed NJ TRANSIT and PATH stations for Tolling Scenario E. These are further described in Table 4C-39, along with accompanying project improvements *[and Table 4C-40 summarizes how mitigation measures will be implemented by the Project Sponsors]*.

Improvements that could alleviate the predicted potential adverse effects include increasing escalator speeds, adding additional wayfinding to distribute passengers, and stair improvements, depending upon location. With the implementation of these improvements, the adverse effects would be ameliorated. In the case of the predicted adverse effect in New Jersey under certain tolling scenarios, planned improvements have been coordinated with NJ TRANSIT and PANYNJ (PATH); coordination will continue for a detailed monitoring program and implementation of improvements, should they be warranted.

Contrasting the projected increases in passenger volumes among the various tolling scenarios, Tolling Scenarios D and F are expected to yield the same or comparable adverse effects that could be addressed with the same Project improvements that are identified for Tolling Scenario E, the representative tolling scenario with the highest incremental ridership increases. While these adverse effects and need for Project improvements may also materialize for Tolling Scenarios A, B, C, and G, the severity of the adverse effects and extent of Project improvements needed may not be needed or may be less than for Tolling Scenario E, depending upon the location.

In consideration of reduced ridership on the subway due to the COVID-19 pandemic, TBTA and the other sponsoring agencies have committed to monitoring before and after Project implementation at the select locations at which adverse effects are predicted under the analyzed tolling scenario. If ridership at those station elements increases (in comparison to pre-implementation ridership) at or above the level anticipated, the Project Sponsors will implement the mitigation measures described above. Because strategies at two NYCT VCEs may require additional planning, design, and construction, the operating agencies will advance planning and design efforts subsequent to approval of the Project to expedite the implementation of improvement strategies if they are warranted by the above monitoring efforts. Short-term, adverse effects may temporarily occur during this construction or implementation process.

Table 4C-38. Summary of Effects of the CBD Tolling Alternative on Transit

TOPIC	SUMMARY OF EFFECTS	LOCATION	DATA SHOWN IN TABLE	TOLLING SCENARIO							POTENTIAL ADVERSE EFFECT	MITIGATION AND ENHANCEMENTS
				A	B	C	D	E	F	G		
Transit Systems	▪ The Project would generate a dedicated revenue source for investment in the transit system. ▪ Transit ridership would increase by 1 to 2 percent systemwide for travel to and from the Manhattan CBD, because some people would shift to transit rather than driving. Increases in transit ridership would not result in adverse effects on line-haul capacity on any transit routes.	New York City Transit	% Increase or decrease in total daily transit ridership systemwide	1.5%–2.1%							No	**No mitigation needed.** No adverse effects
		PATH		0.8%–2.0%								
		Long Island Rail Road		0.6%–2.0%								
		Metro-North Railroad		0.6%–1.9%								
		NJ TRANSIT Commuter Rail		0.3%–2.3%								
		MTA/NYCT Buses		1.3%–1.6%								
		NJ TRANSIT Bus		0.5%–1.1%								
		Other buses (suburban and private operators)		0.0%–0.9%								
		Ferries (Staten Island Ferry, NYC Ferry, NY Waterway, Seastreak)		2.5%–3.5%								
		Roosevelt Island Tram		1.7%–4.1%								
Bus System Effects	Decreases in traffic volumes within the Manhattan CBD and near the 60th Street boundary of the Manhattan CBD would reduce the roadway congestion that adversely affects bus operations, facilitating more reliable, faster bus trips.	Manhattan local buses	% Increase or decrease at maximum passenger load point	Increases of 0.5%–1.2%							No	**No mitigation needed.** No adverse effects
		Bronx express buses		-1.6% to 2.2%								
		Queens local and express buses (via Ed Koch Queensboro Bridge)		2.0%–2.8%								
		Queens express buses (via Queens-Midtown Tunnel)		-1.3% to 4.1%								
		Brooklyn local and express buses		1.3%–2.6%								
		Staten Island express routes (via Brooklyn)		3.7%–4.5%								
		Staten Island express routes (via NJ)		1.0%–2.8%								
		NJ/West of Hudson buses (via Holland Tunnel)		- 1.4% to 1.4%								
		NJ/West of Hudson buses (via Lincoln Tunnel)		0.4%–1.5%								

TOPIC	SUMMARY OF EFFECTS	LOCATION	DATA SHOWN IN TABLE	TOLLING SCENARIO A	B	C	D	E	F	G	POTENTIAL ADVERSE EFFECT	MITIGATION AND ENHANCEMENTS
Transit Elements	Increased ridership would affect passenger flows with the potential for adverse effects at certain vertical circulation elements (i.e., stairs and escalators) in five transit stations: ▪ Hoboken Terminal, Hoboken, NJ PATH station ▪ Times Sq-42 St/42 St-Port Authority Bus Terminal subway station in the Manhattan CBD (N, Q, R, W, and S; Nos. 1, 2, 3, and 7; and A, C, E lines) ▪ Flushing-Main St subway station, Queens (No. 7 line) ▪ 14th Street-Union Square subway station in the Manhattan CBD (Nos. 4, 5, and 6; and L, N, Q, R, W lines) ▪ Court Square subway station, Queens (No. 7 and E, G, M lines)	Hoboken Terminal–PATH station (NJ) Stair 01/02	Net passenger increases or decreases at stair in the peak hour	45	72	122	164	240	205	139	Yes	**Mitigation needed for Tolling Scenarios E and F.** TBTA will coordinate with NJ TRANSIT and PANYNJ to monitor pedestrian volumes on Stair 01/02 one month prior to commencing tolling operations to establish a baseline, and two months after Project operations begin. If a comparison of Stair 01/02 passenger volumes before and after implementation shows an incremental change that is greater than or equal to 205, then TBTA will coordinate with NJ TRANSIT and PANYNJ to implement improved signage and wayfinding to divert some people from Stair 01/02, and supplemental personnel if needed.
		42 St-Times Square–subway station (Manhattan) Stair ML6/ML8 connecting mezzanine to uptown 1/2/3 lines subway platform	Relative increase or decrease in passenger volumes at station OVERALL as compared to Tolling Scenario E (not only at the affected stair or location) in the peak hour, peak period	63%	59%	68%	82%	100%	82%	56%	Yes	**Mitigation needed.** TBTA will coordinate with MTA NYCT to implement a monitoring plan for this location. The plan will identify a baseline, specific timing, and a threshold for additional action. If that threshold is reached, TBTA will coordinate with MTA NYCT to remove the center handrail and standardize the riser, so that the stair meets code without the hand rail. The threshold will be set to allow for sufficient time to implement the mitigation so that the adverse effect does not occur.
		Flushing-Main St subway station (Queens)–Escalator E456 connecting street to mezzanine level	Relative increase or decrease in passenger volumes at station OVERALL as compared to Tolling Scenario E (not only at the affected stair or location) in the peak hour, peak period	116%	91%	108%	116%	100%	133%	72%	Yes	**Mitigation needed**. TBTA will coordinate with MTA NYCT to implement a monitoring plan for this location. The plan will identify a baseline, specific timing, and a threshold for additional action. If that threshold is reached, MTA NYCT will increase the speed from 100 feet per minute (fpm) to 120 fpm.
		Union Sq subway station (Manhattan)–Escalator E219 connecting the L subway line platform to the Nos. 4/5/6 line mezzanine	Relative increase or decrease in passenger volumes at station OVERALL as compared to Tolling Scenario E (not only at the affected stair or location) in the peak hour, peak period	63%	82%	87%	102%	100%	95%	61%	Yes	**Mitigation needed**. TBTA will coordinate with MTA NYCT to implement a monitoring plan for this location. The plan will identify a baseline, specific timing, and a threshold for additional action. If that threshold is reached, MTA NYCT will increase the escalator speed from 100 fpm to 120 fpm.
		Court Sq subway station (Queens)–Stair P2/P4 to Manhattan-bound No. 7 line	Relative increase or decrease in passenger volumes at station OVERALL as compared to Tolling Scenario E (not only at the affected stair or location) in the peak hour, peak period	98%	90%	102%	104%	100%	117%	97%	Yes	**Mitigation needed.** TBTA will coordinate with MTA NYCT to implement a monitoring plan for this location. The plan will identify a baseline, specific timing, and a threshold for additional action. If that threshold is reached, TBTA will coordinate with MTA NYCT to construct a new stair from the northern end of the No. 7 platform to the street. The threshold will be set to allow for sufficient time to implement the mitigation so that the adverse effect does not occur.

Table 4C-40. *[Summary of the CBD Tolling Alternative Implementation Approach for Mitigation and Enhancement Measures for Transit]*

RELEVANT LOCATION(S)	DESCRIPTION OF MITIGATION	TIMELINE FOR PRE- AND POST-PROJECT IMPLEMENTATION DATA COLLECTION FOR SPECIFIC MEASURES	THRESHOLD FOR DETERMINING WHEN NEXT STEP(S) WILL BE IMPLEMENTED	TIMING FOR SPECIFIC MEASURES	LEAD AGENCY
Hoboken Terminal–PATH station (NJ) Stair 01/02	TBTA will coordinate with NJ TRANSIT and PANYNJ to monitor pedestrian volumes on Stair 01/02 one month prior to commencing tolling operations to establish a baseline, and two months after Project operations begin. If a comparison of Stair 01/02 passenger volumes before and after Project implementation shows an incremental change that is greater than or equal to 205, then TBTA will coordinate with NJ TRANSIT and PANYNJ to implement improved signage and wayfinding to divert some people from Stair 01/02, and supplemental personnel if needed.	For stair passenger volumes, baseline data will be collected one month prior to commencing tolling operations to establish a baseline, and two months after Project operations begin. Station ridership data is collected and evaluated in an ongoing manner by NJ TRANSIT and PANYNJ.	For signage, if a comparison of Stair 01/02 peak-hour passenger volumes before and after Project implementation shows an incremental change that is greater than or equal to 205. For supplemental personnel, if the threshold for signage has been reached but signage has not yet been installed, and overall ridership at Hoboken Terminal is 90 percent of 2019 levels 30 days prior to commencing tolling operations.	The monitoring plan will be agreed to by TBTA, PANYNJ, and NJ TRANSIT prior to a decision document being issued and MOU will be drafted thereafter. The MOU will be executed within 120 days after toll rates are set. Signage design will commence after the MOU is executed. Signage fabrication and installation will begin immediately after observing passenger volumes in excess of the threshold for next steps. Supplemental personnel, if needed, will be stationed within 45 days after observing passenger volumes in excess of the threshold for next steps. Supplemental personnel will be used until signage is fabricated and installed.	TBTA will lead and coordinate with NJ TRANSIT and PANYNJ.
42 St-Times Square subway station (Manhattan) Stair ML6/ML8 connecting mezzanine to uptown 1/2/3 lines subway platform	TBTA will coordinate with MTA NYCT to implement a monitoring plan for this location. The plan will identify a baseline, specific timing, and a threshold for additional action. If that threshold is reached, TBTA will coordinate with MTA NYCT to remove the center handrail and standardize the riser, so that the stair meets code without the hand rail. The threshold will be set to allow for sufficient time to implement the mitigation so that the adverse effect does not occur.	Exact timing will be based on seasonality and other factors such as service changes and construction activity in the station. For stair passenger volumes, baseline data will be collected within the six months prior to Project implementation. Post-implementation data will be collected within the first year after Project implementation. Station ridership data is collected and evaluated in an ongoing manner by MTA NYCT based on turnstile entry and exit data throughout the system.	If a comparison of Stair ML6/ML8 peak hour weekday passenger volumes before and after Project implementation shows an incremental change that is greater than or equal to 92 passengers in the weekday peak hour, and overall ridership at 42 St-Times Square subway station exceeds 90 percent of 2019 levels. The methods of data collection and evaluation will follow standard practices pursuant to guidelines of the *CEQR Technical Manual* and will be coordinated with NYCT.	Design and resource allocation will begin immediately after the passenger volume threshold is exceeded, and the hand rail will be removed prior to overall ridership at the station exceeding 90 percent of 2019 levels.	TBTA will lead in partnership MTA NYCT.
Flushing-Main St subway station (Queens)–Escalator E456 connecting street to mezzanine level	TBTA will coordinate with MTA NYCT to implement a monitoring plan for this location. The plan will identify a baseline, specific timing, and a threshold for additional action. If that threshold is reached, MTA NYCT will increase the speed from 100 feet per minute (fpm) to 120 fpm.	Exact timing will be based on seasonality and other factors such as service changes and construction activity in the station. For escalator passenger volumes, baseline data will be collected within the six months prior to Project implementation. Post-implementation data will be collected within the first year after Project implementation.	If a comparison of Escalator E456 peak hour weekday passenger volumes before and after Project implementation shows an incremental change that is greater than or equal to 26 passengers in the weekday peak hour, and overall ridership at Flushing-Main St subway station exceeds 90 percent of 2019 levels. The methods of data collection and evaluation will follow standard practices pursuant to guidelines of the *CEQR Technical Manual* and will be coordinated with NYCT.	Prior to overall ridership at the station exceeding 90 percent of 2019 levels.	TBTA will lead in partnership MTA NYCT.
Union Sq subway station (Manhattan)–Escalator E219 connecting the L subway line platform to the Nos. 4/5/6 line mezzanine	TBTA will coordinate with MTA NYCT to implement a monitoring plan for this location. The plan will identify a baseline, specific timing, and a threshold for additional action. If that threshold is reached, MTA NYCT will increase the escalator speed from 100 fpm to 120 fpm.	Exact timing will be based on seasonality and other factors such as service changes and construction activity in the station. For escalator passenger volumes, baseline data will be collected within the six months prior to Project implementation. Post-implementation data will be collected within the first year after Project implementation. Station ridership data is collected and evaluated in an ongoing manner by MTA NYCT based on turnstile entry and exit data throughout the system.	If a comparison of Escalator E219 peak hour weekday passenger volumes before and after Project implementation shows an incremental change that is greater than or equal to 21 passengers in the weekday peak hour, and overall ridership at Union Sq subway station exceeds 90 percent of 2019 levels. The methods of data collection and evaluation will follow standard practices pursuant to guidelines of the *CEQR Technical Manual* and will be coordinated with NYCT.	Prior to overall ridership at the station exceeding 90 percent of 2019 levels.	TBTA will lead in partnership MTA NYCT.

RELEVANT LOCATION(S)	DESCRIPTION OF MITIGATION	TIMELINE FOR PRE- AND POST-PROJECT IMPLEMENTATION DATA COLLECTION FOR SPECIFIC MEASURES	THRESHOLD FOR DETERMINING WHEN NEXT STEP(S) WILL BE IMPLEMENTED	TIMING FOR SPECIFIC MEASURES	LEAD AGENCY
Court Sq subway station (Queens)–Stair P2/P4 to Manhattan-bound No. 7 line	TBTA will coordinate with MTA NYCT to implement a monitoring plan for this location. The plan will identify a baseline, specific timing, and a threshold for additional action. If that threshold is reached, TBTA will coordinate with MTA NYCT to construct a new stair from the northern end of the No. 7 platform to the street. The threshold will be set to allow for sufficient time to implement the mitigation so that the adverse effect does not occur.	Exact timing will be based on seasonality and other factors such as service changes and construction activity in the station. For stair passenger volumes, baseline data will be collected within the six months prior to Project implementation. Post-implementation data will be collected within the first year after Project implementation. Station ridership data is collected and evaluated in an ongoing manner by MTA NYCT based on turnstile entry and exit data throughout the system.	If a comparison of Stair P2/P4 peak hour weekday passenger volumes before and after Project implementation shows an incremental change that is greater than or equal to 101 passengers in the weekday peak hour, and overall ridership at Court Sq subway station exceeds 90 percent of 2019 levels, and if construction by an outside developer is not likely in the foreseeable future. The methods of data collection and evaluation will follow standard practices pursuant to guidelines of the *CEQR Technical Manual* and will be coordinated with NYCT.	Design and resource allocation will begin immediately after the passenger volume threshold is exceeded and will be implemented prior to overall ridership at the station exceeding 90 percent of 2019 levels (if construction by an outside developer is not likely in the foreseeable future).	TBTA will lead in partnership MTA NYCT.