2. Project Alternatives

2.1 INTRODUCTION

This EA presents two alternatives: the No Action Alternative and the Proposed Project. As discussed in Chapter 1, "Background and Purpose and Need," MTA undertook an alternatives analysis to evaluate a long list of alternatives and potential station locations for Metro-North service into PSNY. This effort led MTA to proceed with an alternative that would provide PSNY access from Metro-North's NHL via Amtrak's HGL. Metro-North trains operating to PSNY would leave the existing NHL tracks just west of New Rochelle Station and travel on Amtrak's HGL to Harold Interlocking[1] and onward through the East River Tunnels to PSNY. This chapter outlines the No Action Alternative, the alignment options that were developed for the Proposed Project, and the Proposed Project's preferred alignment.

The HGL Corridor consists of the existing Amtrak right-of-way, extending 15.4 miles from Harold Interlocking in Sunnyside, Queens, to Shell Interlocking in New Rochelle, Westchester County, NY. It should be noted that the HGL Corridor is part of Amtrak's Northeast Corridor (NEC), which Amtrak designates as an east/west railroad. Trains travelling on the HGL toward Boston are described as eastbound/outbound and trains traveling toward New York City are described as westbound/inbound. Therefore, in this document—irrespective of the actual geographical orientation of the HGL tracks at any specific location—the direction of travel toward Boston is always called east and the direction of travel toward New York City is always called west. Correspondingly, the neighborhoods on either side of the railroad are always called north or south of the railroad right-of-way.

For purposes of simplifying the presentation and analysis in this EA, MTA divided the HGL Corridor into the following four corridor segments (Figure 2-1), with each segment containing a portion of the HGL Corridor and only Segments 2 and 3 including proposed station areas:[2]

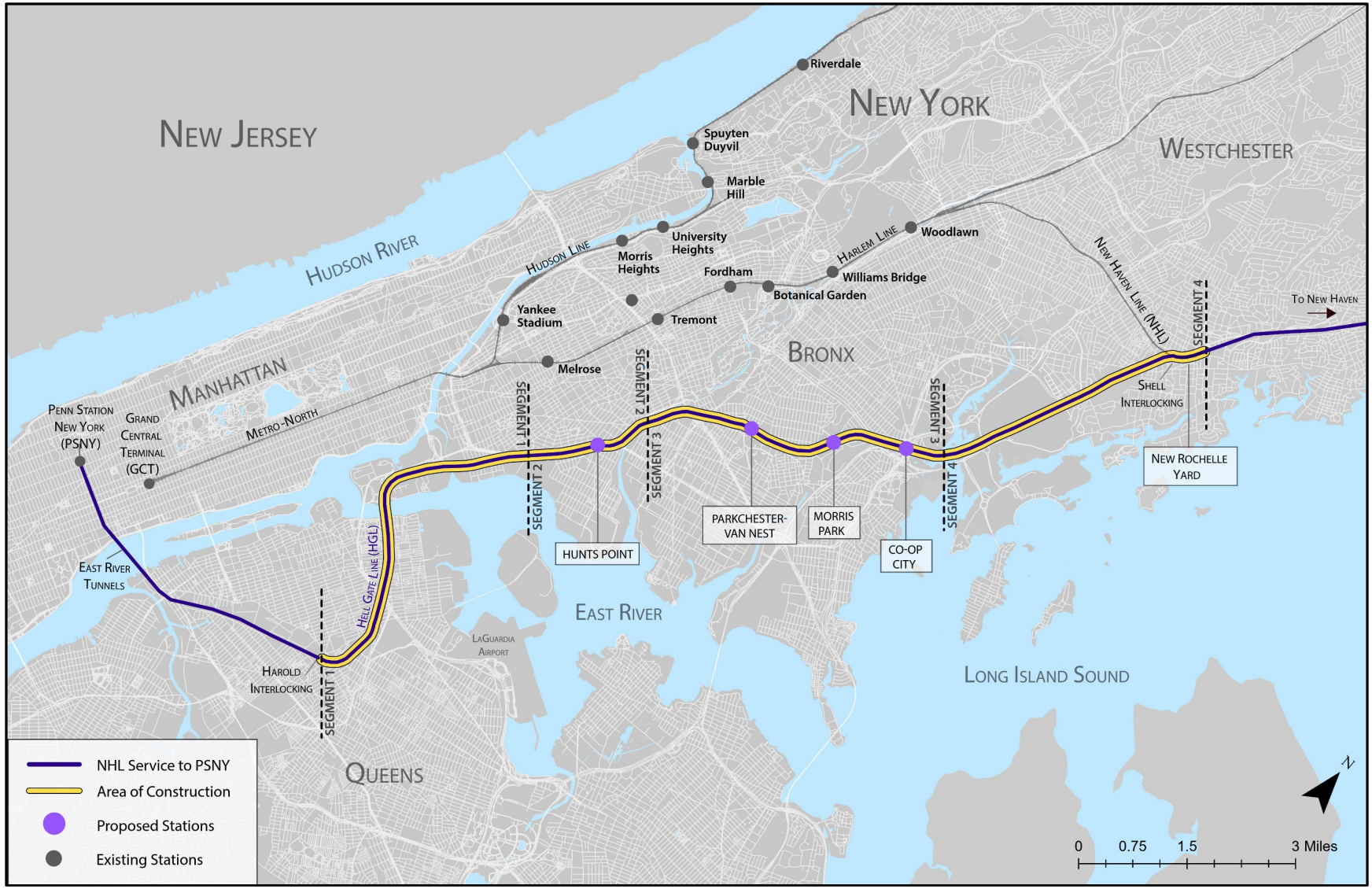
- **Segment 1** extends 5.9 miles from Harold Interlocking (which connects the HGL to the LIRR Main line tracks in Queens) to just west of CSX's Oak Point Yard (Bronx); there are no proposed stations in this segment.
- **Segment 2** extends 1.8 miles from Oak Point Yard to just east of the Bronx River Bridge and includes the Hunts Point station.
- **Segment 3** extends 4.3 miles from just east of the Bronx River Bridge to just west of the Pelham Bay Bridge and includes Parkchester-Van Nest, Morris Park, and Co-op City Stations.
- **Segment 4** extends 3.4 miles from just west of the Pelham Bay Bridge, through the connection with Metro-North's NHL just west of New Rochelle Station, to just east of Metro-North's New Rochelle Yard; there are no proposed stations in this segment.

PSNY is the Proposed Project terminus and is not represented as part of the four segments.

[1] An interlocking is an arrangement of track and signals that allows trains to switch of trains between tracks. The interlocking tracks and signals are interconnected so that conflicting train movements through the interlocking are prevented. This arrangement makes it impossible to signal a train to proceed unless the route the train through the interlocking is safe.

[2] The segment limits were chosen so that each segment exhibits similar characteristics through its full length.

Figure 2-1 Proposed Project – Corridor Segments



Source: WSP, 2021

2.2 ALIGNMENT OPTION DEVELOPMENT

The Proposed Project assumes that the ESA project will be operating, which will free up train slots through the East River Tunnels and at PSNY platforms. The Proposed Project would include infrastructure to support Metro-North trains operating along the HGL and stopping at the four new stations. The HGL was originally designed to hold six railroad tracks and is now occupied by two Amtrak passenger tracks and one CSX freight track; therefore, the existing railroad right-of-way has sufficient space to add the Proposed Project elements. Property acquisitions and easements on Amtrak and City of New York-owned and private property would be required to implement the Proposed Project. In almost all cases, MTA would acquire only portions of the private lots, which would allow the existing uses to continue. Besides permanent acquisitions, temporary use of property would be required during construction. Chapter 3, "Land Use, Zoning, and Public Policy" discusses this topic further.

MTA developed several track alignment options that would fit within the existing railroad right-of-way. Important design considerations for the track layout included minimizing cost and impacts on other existing infrastructure (e.g., catenary and bridges), minimizing future operational impacts to both Amtrak intercity passenger service and Metro-North commuter service, maintaining consistency with NEC FUTURE, and maximizing efficient constructability to have fewest impacts on existing operations during construction.

Table 2-1 summarizes the alignment options that MTA advanced into conceptual design and operations simulation.[1] The options vary by the number of passenger tracks through the proposed stations, the platform configuration(s) at the proposed stations, and the length of the dedicated CSX freight track east of the Bronx River Bridge. While the 3-track/3-track (3+3), 3-track/4-track (3+4), and 4-track/4-track (4+4) options would be operationally feasible, and the 3+4 and 4+4 options would be consistent with NEC FUTURE, the 3+4 track configuration (highlighted in grey in Table 2-1) is the preferred option because it would be consistent with (i.e., would not preclude) the desired NEC FUTURE long-term vision for growth along the NEC, it would have limited constructability issues, and it would maintain current CSX operations. The 3+3 track configuration would take longer for normal train service to be restored after a major disruption to the schedule than the 3+4 or 4+4 options.

Section 2.6 discusses the operations for the Proposed Project.

Table 2-1. Alignment Options

Number of Passenger Tracks		Platform Configuration	Approximate Dedicated Freight Track Length East of Bronx River Bridge (feet)
Hunts Point	Parkchester-Van Nest, Morris Park, & Co-op City		
2	4	Center Island	4,700
2	4	Center Island	14,900
2	3	Center Island and Side	17,200
3	3	Center Island (and/or Side)	6,100
3	**4**	**Center Island**	**5,580**
4	4	Center Island	5,580

Source: WSP, 2020

[1] Appendix A, "Penn Station Access Future Build – Option J1 Network Simulation Report" summarizes the operations simulations.

This EA examines the 3+4 option (the Proposed Project), which would have four tracks through Segment 3. As engineering design and operations analyses advance, MTA could further refine the Proposed Project's alignment. As stated in the MOU between MTA and Amtrak (see Appendix E, "Agency Correspondence and Public Involvement"), intercity service cannot be impacted by PSA service. MTA will perform routine operations analyses near construction completion. The additional refinements are unlikely to result in different environmental impacts from the 3+4 option, because any configuration the trackwork and station construction would occur predominantly within the existing right-of-way. Ridership and operating power requirements would remain consistent because the proposed service levels would not vary. Lastly, power system construction impacts would be identical for any refinement. The following list represents the key Proposed Project elements (primarily within the railroad right-of-way):

- Construct four new Americans with Disabilities Act (ADA) compliant Metro-North passenger stations.
- Realign existing passenger tracks and catenary and construct new passenger tracks and catenary.
- Realign or remove existing freight tracks and construct new freight tracks.
- Construct new associated interlockings, power supply, and distribution.
- Replace ballast and perform drainage work along the HGL Corridor.
- Upgrade the signal system.
- Rehabilitate or replace bridges at Bronx River, Bronxdale Avenue, Eastchester Road, and Pelham Lane.
- Construct a new single-track bridge over the Bronx River.
- Expand New Rochelle Yard.

Section 2.5 discusses the existing infrastructure within the project corridor and the proposed improvements that are part of the Proposed Project.

2.3 STATION LOCATION OPTIONS

2.3.1 Location Screening

As noted in Chapter 1, "Project Background," MTA focused the initial screening for potential station locations on the physical envelope within which each potential new station could be constructed along the existing rights-of-way. The Comparative Screening Report (2002) assessed 20 new station locations, 12 of which were on the Hell Gate Line. To the extent possible, MTA sited the stations for the following reasons:

- Avoid sensitive and protected land uses and structures, e.g., parkland, historic resources, wetlands, residences.
- Minimize property takings.
- Facilitate pedestrian and vehicular access to the station.
- Conform with Metro-North station siting and design guidance.
- Comply with ADA requirements

MTA examined each proposed station location to determine the feasibility of constructing the following:

- A platform of at least 8 to 10 car-lengths
- An entry shelter (i.e., not a station building)
- Any necessary access overpasses, ramps, stairs, and/or elevators

Additionally, MTA estimated and rated the order-of-magnitude capital cost of constructing a new station in each potential location as either low ($1million to 10 million), medium ($10 million to 20 million), or high (more than $20 million).

In this comparative screening, MTA forecast ridership potential at each of the station locations independently without considering any other new-station locations so that each station's ridership potential could be clearly distinguished in both existing and new market areas.

The stations' comparative screening analysis winnowed the 12 HGL potential station locations to the three stations included in the Proposed Project: Co-op City, Parkchester-Van Nest, and Hunts Point. In 2012, after MTA engaged in community outreach meetings with local Bronx community members, MTA added Morris Park Station as the Proposed Project's final additional station.

2.3.2 Stations Characteristics

The new stations in the Proposed Project would all include common elements. Each new station would be located at a segment of straight track (i.e., not on a curve) and include the following:

- A canopied main entrance to the station, with clear wayfinding elements.
- An ADA-compliant elevator(s) to connect with an overpass that would further connect to passenger platforms. The overpass would double as a sheltered waiting area, with a minimum 10-foot-free clear width.
- A station platform 870 feet in length (sufficient to platform up to 10 cars), with Metro-North's standard array of station amenities (e.g., canopies, shelters, benches, passenger information, ticket vending machines).

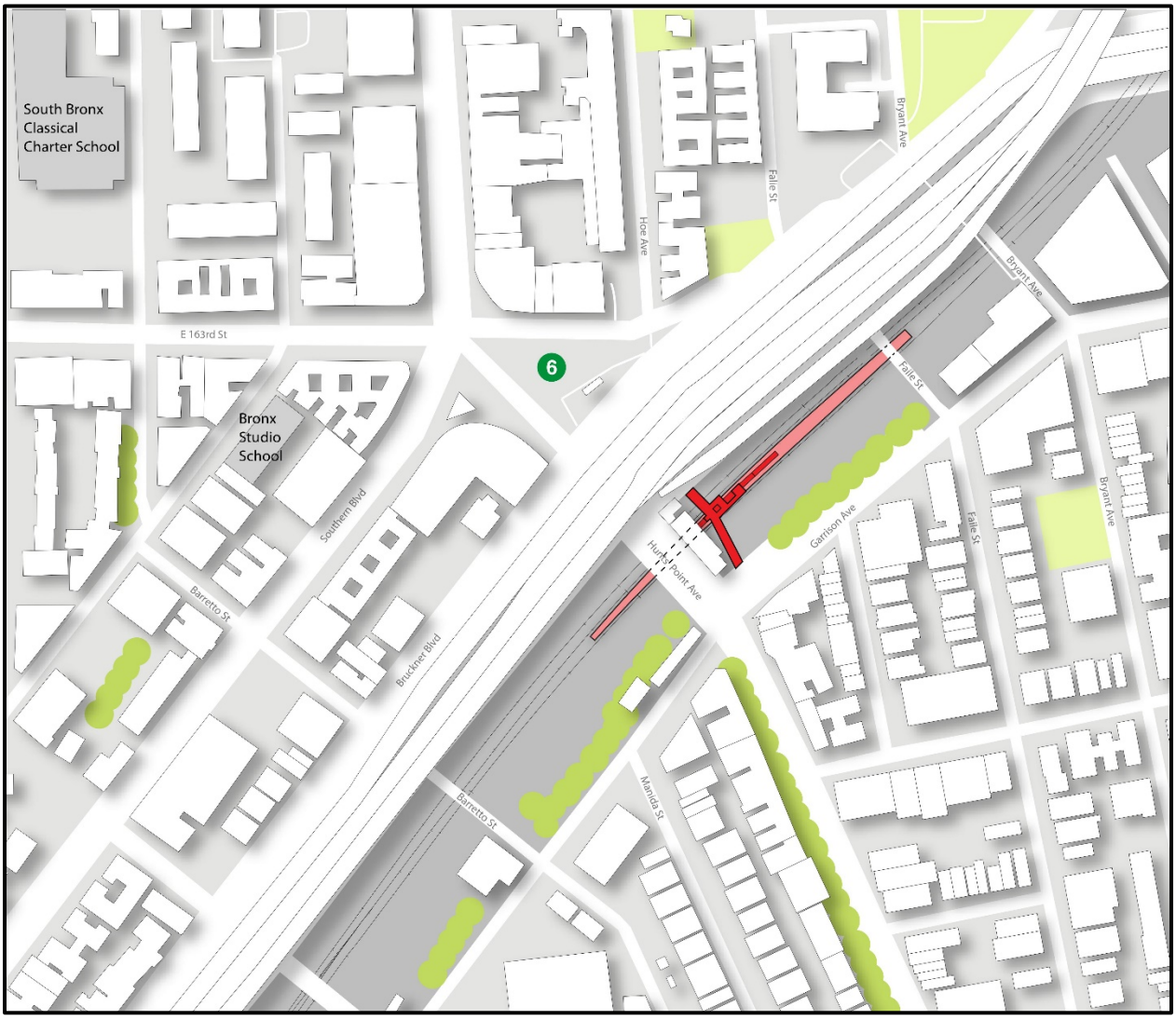
The following discussion describes the specific considerations that MTA used to determine the final proposed location for each new station.

2.3.2.1 Hunts Point Station

The Hunts Point station area has more challenges for station construction and operation than the other proposed station locations. The station would be near Hunts Point Avenue and south of the Bruckner Expressway within a cut, well below street level. This area of the right-of-way has five overhead road bridges, with abutments that constrain the width of the right-of-way and the position of the tracks below. Within the right-of-way, the Oak Point freight rail yard is near this location to the south of the proposed passenger tracks, further limiting the position of the platform. To fit a station platform in this area, along with the passenger tracks and the freight tracks, the platform would have to taper at either end. Hunts Point Avenue is the spine of the adjacent neighborhood, connecting the residential community on the peninsula to the commercial core of Southern Boulevard to the north. While other roadways connect here as well, Hunts Point Avenue has the advantage of connecting pedestrians to the No. 6 Line subway in Monsignor Raul Del Valle Square (an express-stop station). To the east, the right-of-way threads its way under the Bruckner Expressway and curves to the Bronx River Bridge. The ramping system of the Bruckner Expressway, Sheridan Expressway, and Bruckner Boulevard to the east of Faile Street creates a large barrier to the north for pedestrians, and would greatly diminish the value of a station if moved in that direction.

The proposed access to the below-grade station platform would be from the northwest corner of Hunts Point and Garrison Avenues (Figure 2-2). Passengers would use newly constructed stairwells and/or an ADA-compliant elevator to reach the platform. While a former New York, New Haven and Hartford Railroad rail station still stands on the east side of Hunts Point Avenue, its condition is extremely poor and does not align with the proposed project track alignment. Further, a third party leases the station building as a small business incubator, which would not be able to accommodate station access in addition to business opportunities. While the constraints of the area are difficult, as mentioned the station is within two blocks of the No. 6 Line subway. The Hunts Point Peninsula—also home to the Fulton Fish Market—has taken on a larger role of handling food distribution within the city along with its associated jobs and commuting workers who could utilize the proposed station.

Figure 2-2. Proposed Hunts Point Station Location



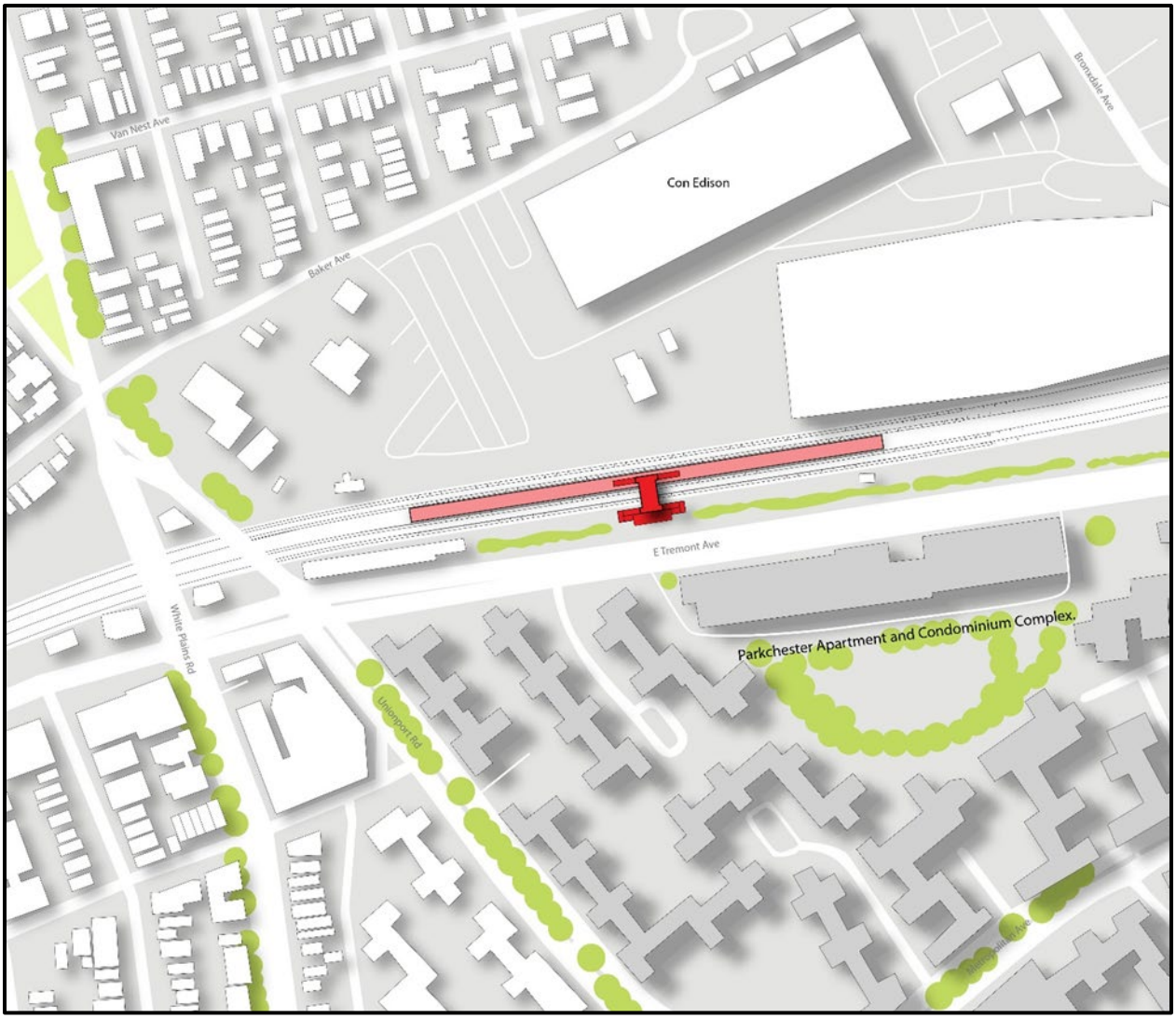
Source: HNTB, 2020.

2.3.2.2 Parkchester-Van Nest Station

This station would be within the railroad right-of-way east of Unionport Road and north of Tremont Avenue East on the site of the former New York, New Haven, and Hartford Railroad station. The station would be adjacent to the Van Nest Substation (which powers the HGL) and the Con Edison facility to the north and the Parkchester Apartment Complex to the south.

As shown in Figure 2-3, the tracks heading west from this location rapidly change into a curve in order to fit the four tracks between the bridge abutments of White Plains and Unionport Roads above the tracks. The platform cannot be located farther west because of the track curvature and the limited space available under those roads. Access to the at-grade station would be from the north side of Tremont Avenue East, using the former railroad service building lot. Stairwells and an elevator would be constructed to provide passenger access between the platform and street level. MTACD and the New York City Department of Transportation have discussed potentially creating a connection from the station platform to the Unionport Bridge to better serve the Van Nest neighborhood farther north. Similarly, a private developer that owns a site adjacent to the station area has suggested a connection to the north side of the site. However, given the uncertainty of these plans, for the purposes of this EA, MTA analyzed the entrance developed as part of the 30 percent design (to be included in the design-build contract) as part of the Proposed Project. Any impacts from changes to the design would be assessed by MTA and the design-builder through a supplemental NEPA evaluation.

Figure 2-3. Proposed Parkchester-Van Nest Station Location



Source: HNTB, 2020.

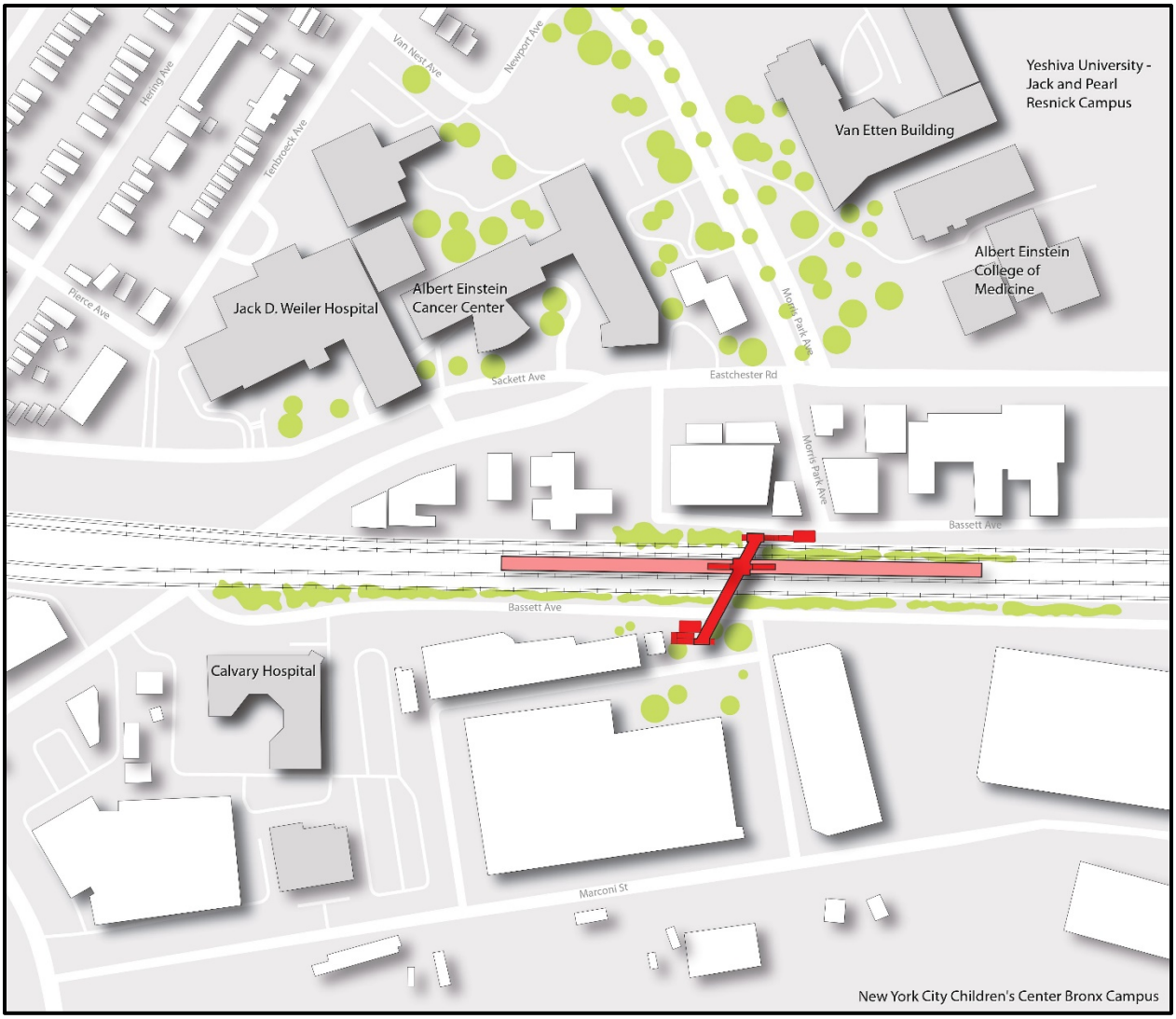
2.3.2.3 Morris Park Station

This station would be in the railroad right-of-way east of Eastchester Road and north of Basset Road in the Morris Park community, which is surrounded by multiple medical centers to the north (Jacobi, Montefiore, and Calvary Hospitals, and Yeshiva Medical School) and a burgeoning redevelopment site to the south (the former Bronx Psychiatric Center) (Figure 2-4). The overpass connecting to the station platform would provide an important connection between the distinct portions of the neighborhood (the medical campus and the redevelopment area). Two factors prevent the platform from moving farther west:

- The Eastchester Road bridge immediately to the west of this location comprises multiple bridge spans that the tracks have to follow, which limits the length of straight section where a platform could be located.
- Just past the bridge is the start of a large curve in the tracks.

In addition, the platform could not be located farther east because an active distribution center exists to the southeast, and no available corridor exists to create a linkage between the medical centers and the redevelopment area. Lastly, the tracks begin to curve just past the distribution center in order to slot between the large concrete piers that support Pelham Parkway overhead. As mentioned, access to the at-grade station would be from both sides of the right-of-way to serve the array of facilities on either side of the tracks. Morris Park Avenue is the best location for a connection over the right-of-way because of its central location leading into the heart of the community, which is flanked by the various medical facilities. Stairwells and elevators would be constructed to provide passenger access between the platform, overpass, and each end at street level. The north entrance would be next to the tracks near Morris Park Avenue. The south entrance would be across the street from the tracks, next to an existing 9/11 memorial. Although private owners of sites adjacent to the station have suggested a potentially larger station that would serve as a gateway between the two neighborhoods, given the uncertainty of these plans, for the purposes of this EA, MTA analyzed the layout developed as part of the 30 percent design (to be included in the design-build contract) as part of the Proposed Project. Any impacts from changes to the design would be assessed by MTA and the design-builder through a supplemental NEPA evaluation.

Figure 2-4. Proposed Morris Park Station Location



Source: HNTB, 2020.

2.3.2.4 Co-op City Station

The proposed station would be within the railroad right-of-way south of Erskine Place and west of DeReimer Avenue, in Section 5 of Co-op City see Figure 2-5). As the easternmost station, at the end of the new four-track section of the HGL, the station platform would be located sufficiently west to allow the four tracks to merge into two to then cross the existing Pelham Bay Bridge. The bridge is at the end of a curve, meaning the switches for merging the tracks cannot be directly adjacent to the bridge, but rather more inland. The station platform cannot be located next to those switches so that trains not stopping at the station could continue unimpeded. These technical requirements constrain the eastern limit of the station location. Further, the proposed station location was established to avoid precluding Amtrak's future replacement of the Pelham Bay Bridge, which is expected to be higher than the existing bridge to minimize the number of required openings. (Figure 2-5 represents a potential new bridge.) The New England Thruway (I-95) overhead constrains the western limit of the station location, because the New England Thruway ramps and Hutchinson River Parkway effectively block access to the local street network in that area. To remain accessible, the platform must extend slightly eastward past the overhead New England Thruway bridge to be able to connect to the local street network on Erskine Place at DeReimer Avenue. Access at this location would be via a newly constructed overpass above the railroad right-of-way using stairwells and an elevator—the latter being required for ADA compliance. An expansion of the sidewalk network westward along the edge of the right-of-way and the Erskine Place Ramp to the New England Thruway could be developed and lead to an additional entrance to the west end of the platform. Layovers for New York City buses occur near the station, and this station would leverage those stops to serve the greater Co-op City community. Chapter 12, "Transportation" further discusses traffic circulation.

Figure 2-5. Proposed Co-op City Station Location

Source: HNTB, 2020.

2.4 NO ACTION ALTERNATIVE

To determine any potential adverse impacts from the Proposed Project, MTA compared impacts from a No Action Alternative to those of the Proposed Project's future conditions. The No Action Alternative includes any transportation projects within the study areas that are programmed and committed for implementation by 2025. A ½-mile radius around the proposed station locations delineates the stations' study areas, and transportation projects along the corridor are identified within 500 feet of the rail right-of-way.

2.4.1 Programmed and Committed Projects

The No Action Alternative includes programmed and committed transportation projects identified in the fiscally constrained (i.e., with committed or available resources) portion of the New York Metropolitan Transportation Council (NYMTC) Regional Transportation Plan: Plan 2045, Maintaining the Vision for a Sustainable Region if they will be implemented by 2025. The No Action Alternative does not include projects that are proposed or in planning phases of project development—that is, not programmed and committed for implementation by 2025. MTA identified such projects to define the broader planning context within which the Proposed Project would be implemented.

No projects are currently planned along the HGL. The No Action Alternative includes the following transportation construction projects:

- **East Side Access (ESA)** – LIRR is constructing a new connection from Sunnyside Queens to a new terminal beneath the lower level of GCT. A projected 67 peak-period trains will serve the new GCT terminal, which will reduce the overall number of LIRR trains destined for PSNY.[2] Currently, access to and from Amtrak's HGL requires routings through Harold Interlocking that necessitate merging and diverging from routes that are also used by LIRR train traffic. This constraint has long been recognized. The ESA project is coordinated with an Amtrak bypass routes project funded by an FRA high speed rail grant and together the projects will eliminate the constraint by providing grade-separated routes through Harold Interlocking for Amtrak and Metro-North traffic on the HGL, better accommodating Metro-North NHL service into PSNY.
- **Hunts Point Planning-Environmental Link Study** – The NYCDCP study assessed an area that is within the proposed Hunts Point Station area and nearby highway truck access to the Hunts Point Food Distribution Center. The New York State Department of Transportation eventually combined the study with the Transforming the South Bronx: Bruckner-Sheridan Expressway Improvements Project, which is discussed further below.
- **Transforming the South Bronx: Bruckner-Sheridan Expressway Improvements Project** – The New York State Department of Transportation is designing a $1.8 billion project in the South Bronx. This project will add a third lane to the Bruckner Expressway and relocate Sheridan Expressway ramps, which will eliminate the bottleneck at the Bruckner-Sheridan Expressway interchange, thereby improving access to Hunts Point. The project will also install new signage and pavement markers to direct auto, truck, and pedestrian traffic within the Hunts Point peninsula. Additionally, the project will redevelop the Sheridan Expressway as an urban boulevard, to give the local community access to the currently inaccessible Bronx River waterfront. The FHWA issued a Record of Decision (ROD) for the project on April 9, 2019. The

[2] LIRR ESA Final EIS. (2001) Page 9B-5

conversion of expressway to the Sheridan Boulevard was completed in December 2019. Construction of the ramps began in early 2020 and is expected to be completed by fall 2022.[3]

- **Moynihan Station Phase II** – New York State Empire State Development Corporation (ESD) is constructing a $1.6 billion update of the former James A. Farley Post Office building into a new 255,000-square-foot train hall and expanding the PSNY complex to Ninth Avenue. The train hall will have a 92-foot-tall skylight and will add access to nine PSNY platforms and 17 tracks (to be serviced by 11 escalators and seven elevators). The expansion will also add 700,000 square feet of commercial, retail, and dining venues inside the transformed Farley Building, as well as employee spaces for Amtrak and the LIRR. Work was completed at the end of 2020 and the train hall opened on January 1, 2021.
- **Penn Station New East End Gateway and LIRR Concourse** – MTA is constructing a new East End Gateway and expanding the LIRR West 33rd Street concourse. A new entrance will connect passengers directly to the LIRR West 33rd Street concourse from West 33rd Street and Seventh Avenue, and will include three escalators, a stairway, and an elevator. The project will widen the concourse from 30 feet to 57 feet to allow easier access to trains and reduce potentially dangerous concourse crowding. The design will also increase the ceiling height to 18 feet across the entire concourse, eliminating existing 7- and 8-foot-high areas within the concourse that made it feel cramped. Lighting will be improved and more intuitive wayfinding will be provided. Customers will also have new direct sight lines to track level and there will be additional retail and dining options in the concourse. Phase I (canopy and escalators) was completed at the end of 2020 and opened to the public on January 1, 2021. Phase II (LIRR concourse renovation) is scheduled for completion in early 2023.

In addition to the identified transportation projects, MTA identified several property development projects within the study area, most within communities surrounding the proposed station areas. Chapter 3, "Land Use, Zoning and Public Policy" summarizes these property development projects.

2.4.2 Future Projects

MTA identified the following future regional transportation construction projects, but the No Action Alternative does not include them because of their current development and investment levels:

- **Gateway Program: Hudson Tunnel Project** – This project will rehabilitate the existing tunnel and create a new two-track rail tunnel serving PSNY under the Hudson River from New Jersey. A Draft EIS, jointly prepared by FRA and NJ TRANSIT pursuant to NEPA, was released in July 2017. Construction of the new tunnel is planned to be complete in 2030 so that rehabilitation of the existing tunnel can be performed and completed by 2034. This is beyond the 2025 analysis year for the Proposed Project.
- **Penn Station Expansion Project** – The purpose of this project is to increase the rail operations at PSNY to meet current and forecasted future passenger volumes and provide much needed operational flexibility to manage service disruptions and emergency situations. MTA, Amtrak, and NJ TRANSIT are developing initial alternatives for expansion of PSNY, which will be evaluated in an alternatives screening process to support the environmental evaluation of the project in accordance with NEPA. Work is underway to develop preliminary service plans to support the NEPA analyses that incorporates and integrates growth

[3] https://www.dot.ny.gov/southbronx/hunts-point

plans of MTA, Amtrak, and NJ TRANSIT upon completion of the Gateway Program. MTA does not anticipate any changes to operation of NHL trains as a result of this project.

- **Empire Station Complex** – This is a comprehensive redevelopment initiative to create a modern, transit-oriented commercial district centered around PSNY. This project is currently being advanced by the Empire State Development (ESD), a New York State entity with a mission of supporting and enhancing the state's economy. ESD will be creating a General Project Plan on all or portions of nine Manhattan blocks that encompass and surround PSNY. The plan would allow acquisition of required property and development of new commercial buildings on eight development sites around the station. As part of this development, new entrances to PSNY would be created and other improvements to transit facilities would be made. In addition, the resulting redevelopment would generate essential revenue for substantial passenger rail and transit reconstruction of the existing PSNY, the Penn Station Expansion Project, as well as access improvements at PSNY and to the area's subway stations. ESD is currently preparing an EIS for the project in accordance with New York State's environmental review regulations.
- **Amtrak Pelham Bay Bridge Replacement** – Amtrak plans to replace the Pelham Bay Bridge— a movable bridge that crosses the Hutchinson River near Co-op City in the Bronx—at some time in the future. This project is in the preliminary planning phases and will undergo NEPA environmental review, which is anticipated to be led by FRA. The Proposed Project's current design would connect with the existing Pelham Bay Bridge and would not preclude connection to a future bridge. Some future realignment of the approach tracks and station platforms could be required, depending on plans for the replacement bridge. However, the potential adverse impacts of either connection would be essentially the same.
- **East River Tunnels' Resiliency and Mitigation Projects** – Superstorm Sandy flooded two of the four East River Tunnels in 2012, and the flooding damaged tunnel systems. Amtrak proposes conducting the rehabilitation during a full-time closure of one tube at a time. During this construction period, Amtrak, LIRR and NJ TRANSIT train service will be disrupted. Because the Proposed Project would utilize these tunnels, the schedule of this rehabilitation project, which has not been finalized, will likely affect the initiation of full PSA service.
- **Central Business District Tolling Program** – This program, to be overseen by MTA, would charge a variable fee for vehicles driving into Manhattan's Central Business District, defined as south of 60th Street. Originally intended to be implemented by January 2021, the purpose of the program would be to discourage driving in the most congested area of New York City and generate revenue for transit improvement projects. While the state legislation creating Central Business District Tolling specifically excluded the program from local and state environmental review, an environmental review under NEPA will be required. MTA has prepared preliminary environmental documentation in anticipation of starting the NEPA process.

2.5 INFRASTRUCTURE

The following sections describe the existing and proposed major infrastructure elements within the HGL by segment. Note that under the No Action Alternative, no proposed improvements will be in any HGL segment. To the extent possible, the Proposed Project would utilize the existing rail infrastructure. In locations where additional tracks are required, MTA would construct entirely new tracks (and supporting infrastructure) and almost entirely replace the catenary system. As needed, MTA would replace the ballast along the corridor and underdrains installed adjacent to the trackbeds.

2.5.1 Segment 1

Figure 2-6 shows Segment 1's schematic diagram. The existing HGL in this segment includes the following:

- Two passenger tracks
- One freight track at Bowery Bay Junction and two freight tracks at the Oak Point Link enter the CSX Oak Point Yard
- Gate Interlocking at MP-5.1, a universal interlocking between the two Amtrak passenger tracks
- Bowery Bay alternating current (AC) paralleling substation
- 25 Hz/60Hz Overhead Catenary Phase Break, which handles a frequency change in the AC traction power system
- Hell Gate Bridge and Bronx Kill (Little Hell Gate) Bridge

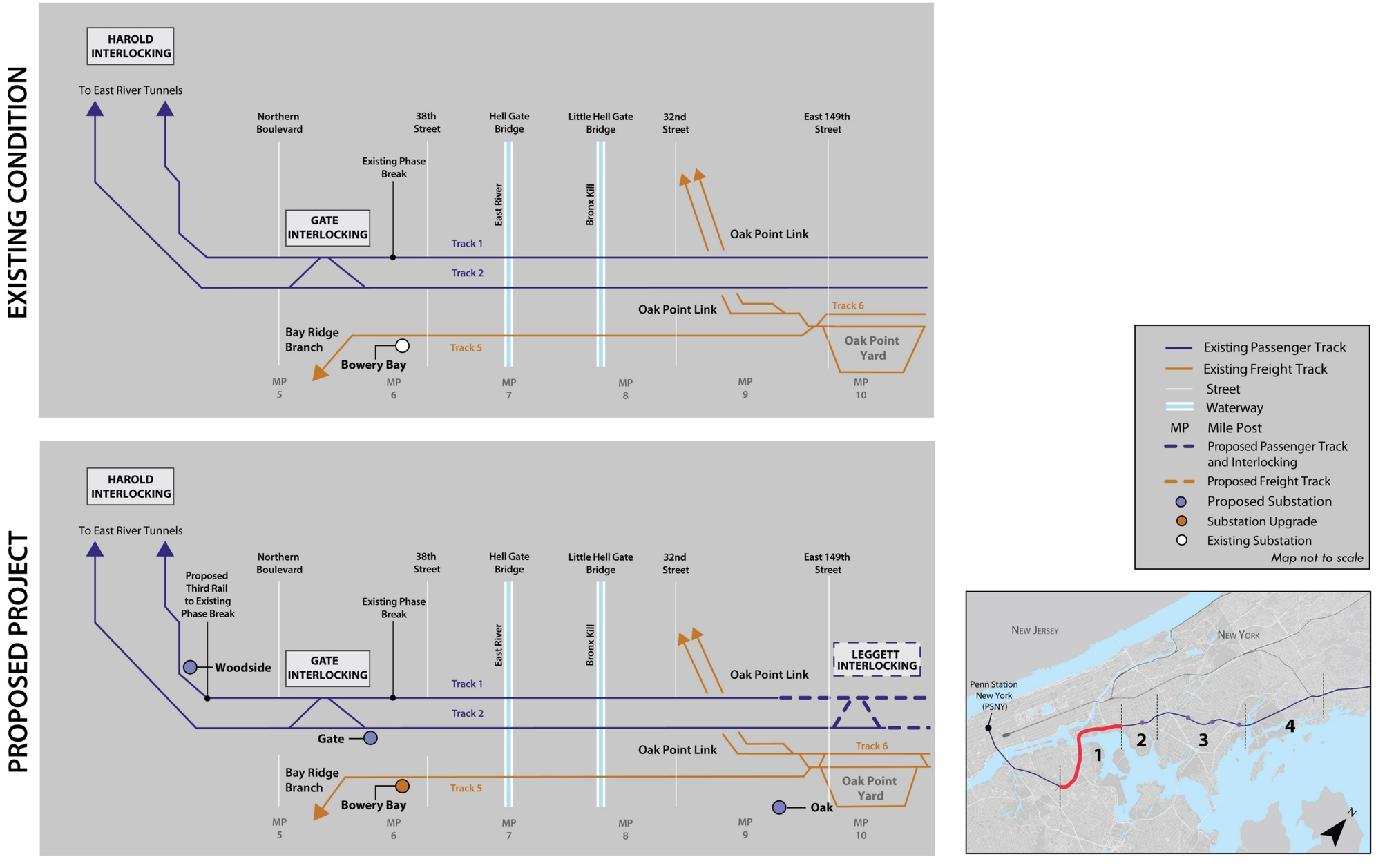
Metro-North's trains operate under either 60 Hz overhead power or DC third-rail power. Therefore, in sections of the HGL with only 25 Hz overhead power available for Amtrak use, new third-rail power is proposed, along with new DC substations to supply traction power. In addition, MTA would upgrade the entire HGL signal system to handle high-density operations (allowing for more trains in operation) with proper positive train control (PTC) overlays,[4] and the power systems to provide adequate power for the projected increase in train traffic.

As shown in Figure 2-6, the Proposed Project would:

- Construct new third rail from Harold Interlocking to the existing phase break with up to two new direct current (DC) Substations (at Woodside and Gate).
- Locate new Woodside DC Substation north of the "Y" where the Amtrak HGL and LIRR Main line tracks diverge
- Locate new Gate DC Substation within the "Y" where Amtrak HGL and CSX tracks diverge.
- Upgrade/renew the Bowery Bay AC Substation.
- Upgrade the signal system.

[4] Positive Train Control is a system designed to prevent train-to-train collisions to be installed on all railroads as mandated by the FRA in 2008.

Figure 2-6 Segment 1 Schematic



Source: WSP, 2020

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2.5.2 Segment 2

Figure 2-7 shows Segment 2's existing schematic. The existing HGL in this segment includes the following:

- Two passenger tracks
- Two freight tracks that converge to one freight track just west of Bronx River Bridge
- CSX Oak Point Yard
- Hunts Point Market Branch junction
- Bronx River Bridge

Segment 2 is within a depressed cut at Hunts Point, constraining the right-of-way width. Only one additional passenger track can be accommodated in the location of the proposed Hunts Point station platform.

The proposed Hunts Point station would be fully ADA accessible, with an accessible pathway leading to an ADA-compliant elevator. To accommodate four passenger tracks at the eastern end of this segment, an additional two-span bridge would need to be constructed north of the existing Bronx River Bridge, in the location of a previously demolished bridge. The existing bridge would be strengthened to handle the additional rail traffic and to increase the useful life of the bridge.

As shown in Figure 2-7, the Proposed Project would:

- Construct a new Hunts Point station.
- Add a new universal Leggett Interlocking, to increase operational flexibility, to be within railroad right-of-way.
- Construct a new Oak AC Substation west of Oak Point Yard.
- Add a new Young Interlocking to handle expansion to three passenger tracks.
- Renew overhead contact system (OCS) and supporting structures and add one passenger track with catenary.
- Realign existing two passenger tracks to make space for Hunts Point station platform.
- Upgrade the signal system.
- Construct a new two-span single-track bridge to the north of the existing Bronx River Bridge to accommodate a new passenger track.
- Rehabilitate the existing Bronx River Bridge.

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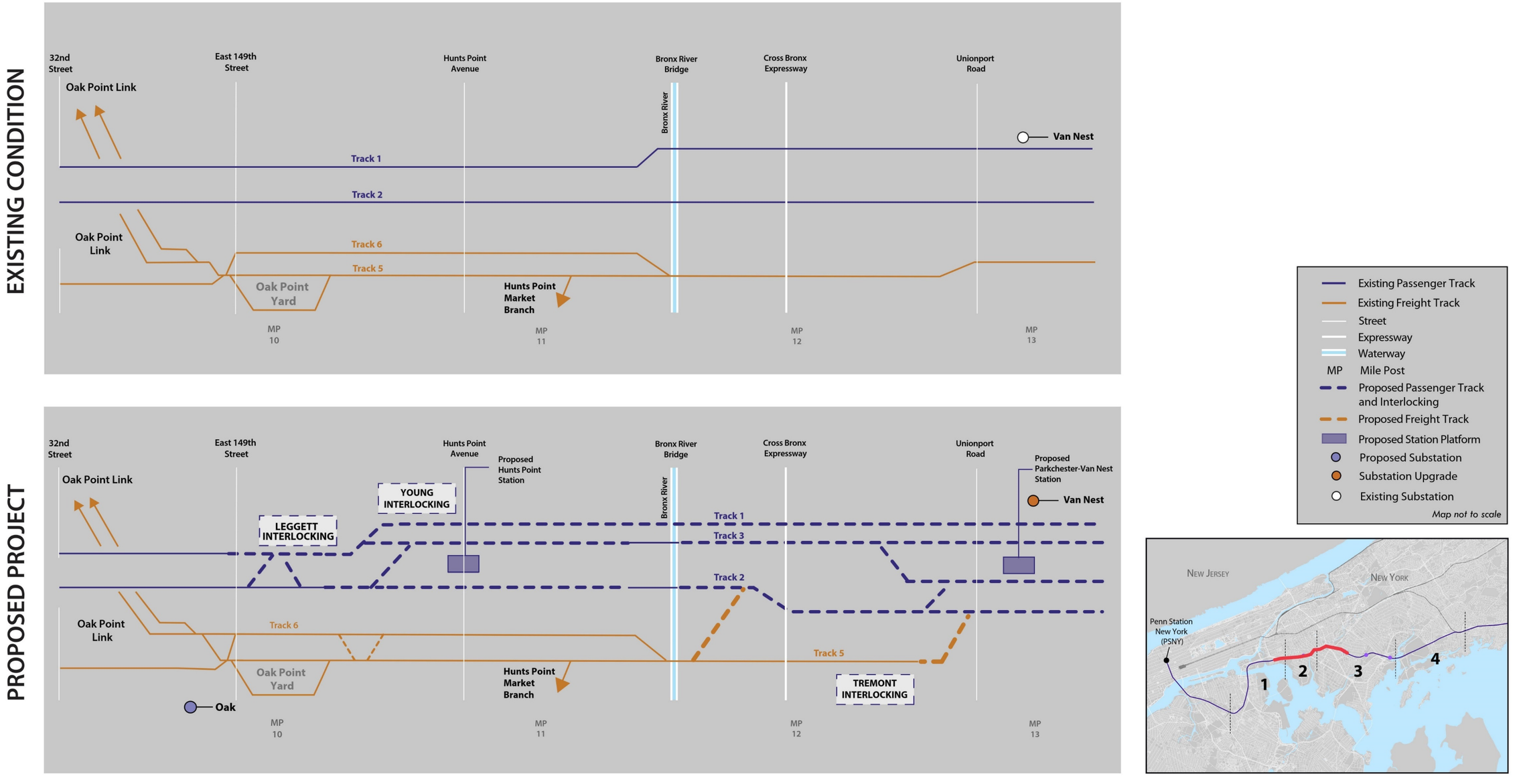
Figure 2-7 Segment 2 Schematic



Source: WSP, 2020

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2.5.3 Segment 3

Figure 2-8 shows the existing Segment 3 schematic. The existing HGL in this segment includes the following:

- Two passenger tracks and one freight track
- Van Nest (AC supply) Substation
- Bronxdale Avenue and Eastchester Road bridges
- Pelham Bay Interlocking, a universal crossover between the two Amtrak passenger tracks and convergence of the freight track with the passenger tracks

In Segment 3, the Proposed Project would improve existing undergrade bridges (rail bridges over roads) to accommodate the additional tracks, realignment of existing tracks, and construction of new tracks. The existing freight track would be merged with the outside passenger track at Tremont Interlocking to provide the space required for four passenger tracks and a center island platform to the east. The Proposed Project would replace the existing AC supply substation at Van Nest to handle the additional traction power requirements of proposed future service, while an additional paralleling substation (Co-op City) would be sited near the new Pelham Bay interlocking at the eastern end where the four passenger tracks merge to become two. This segment would include three new stations—at Parkchester-Van Nest, Morris Park, and Co-op City—each of which would provide ADA-accessible center island platforms with overpasses and elevators.

As shown in Figure 2-8, the Proposed Project would:

- Construct new Parkchester-Van Nest, Morris Park, and Co-op City stations.
- Add two passenger tracks and catenary.
- Construct a new Tremont Interlocking that relocates the freight track connection to passenger track and expands the three passenger tracks four passenger tracks.
- Replace the Van Nest (AC supply) Substation.
- Add new Bronxdale Avenue and Eastchester Road bridge structural elements (spans).
- Reconfigure Pelham Bay Interlocking to merge the four passenger tracks to two passenger tracks approaching the Pelham Bay Bridge with new Co-op City (AC paralleling) Substation.
- Upgrade the signal system.
- Renew the OCS, including supporting structures and ancillary wiring.

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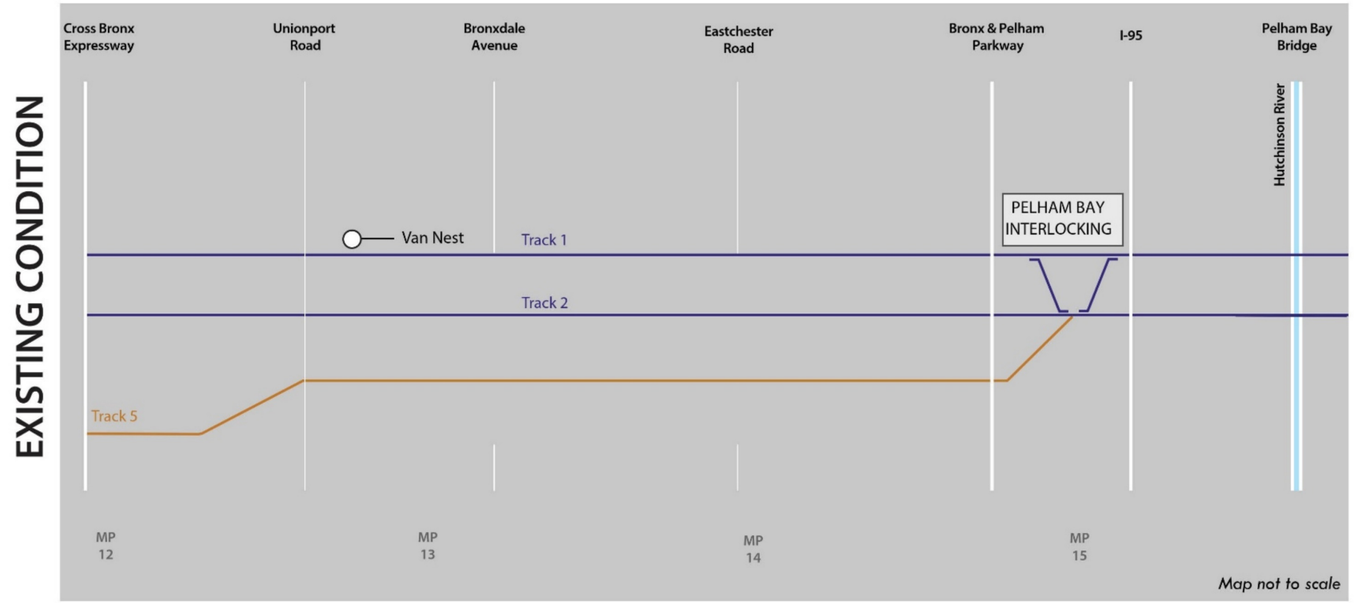
Figure 2-8 Segment 3 Schematic



Source: WSP, 2021

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2.5.4 Segment 4

Figure 2-9 shows the existing Segment 4 schematic. The existing HGL in this segment includes the following:

- Pelham Bay Bridge
- Pelham Lane Pathway Bridge
- Two HGL passenger tracks merging into Metro-North's passenger tracks at CP-216 Shell Interlocking
- Manor Interlocking, a universal crossing between the two Amtrak passenger tracks
- CP-215 Interlocking
- CP-217 Interlocking
- New Rochelle Station
- New Rochelle (AC paralleling) Substation
- New Rochelle Yard

To increase operational flexibility in Segment 4, the Proposed Project would construct an additional interlocking at the Pelham Lane Pathway Bridge, along with an upgrade to the two-track bridge. The Proposed Project would add switches to CP-215 and CP-217 to increase NHL operating flexibility.

The current New Rochelle Yard would be reconfigured and expanded to handle both passenger equipment and maintenance-of-way vehicles.[1] The existing New Rochelle Yard, approximately 0.3 mile long, provides storage for Metro-North maintenance-of-way vehicles and equipment. The yard is also used to turn one trainset during the peak period. The yard would be expanded linearly approximately 0.2 mile to the north/east, to include three stub-end tracks with overhead catenary power. The expanded yard would provide storage for a total of 48 cars in six 8-car trains, aisles for servicing of train cars, an improved and expanded location off the main line for turning trains, and space for maintenance-of-way equipment storage. In addition, employee welfare facilities would be added to the yard and retaining walls would be constructed to protect the yard space from the main line tracks, and separate the yard from adjacent land uses. The expanded New Rochelle Yard would allow Metro-North to turn 27 revenue-to-revenue trains daily in the yard. During the AM peak period (6 a.m. to 10 a.m.), five trains would turn from the expanded New Rochelle Yard for westbound service to PSNY.

As shown in Figure 2-9, the Proposed Project would:

- Upgrade the signal system
- Add a new Bronx Interlocking to increase operational flexibility
- Rehabilitate or replace the Pelham Lane Pathway Bridge
- Replace existing New Rochelle AC paralleling Substation
- Add switches to CP-215 and CP-217
- Expand New Rochelle Yard, currently used for maintenance-of-way vehicles

[1] Maintenance-of-way vehicles are small railroad maintenance vehicles used to transport workers and equipment for smaller maintenance jobs.

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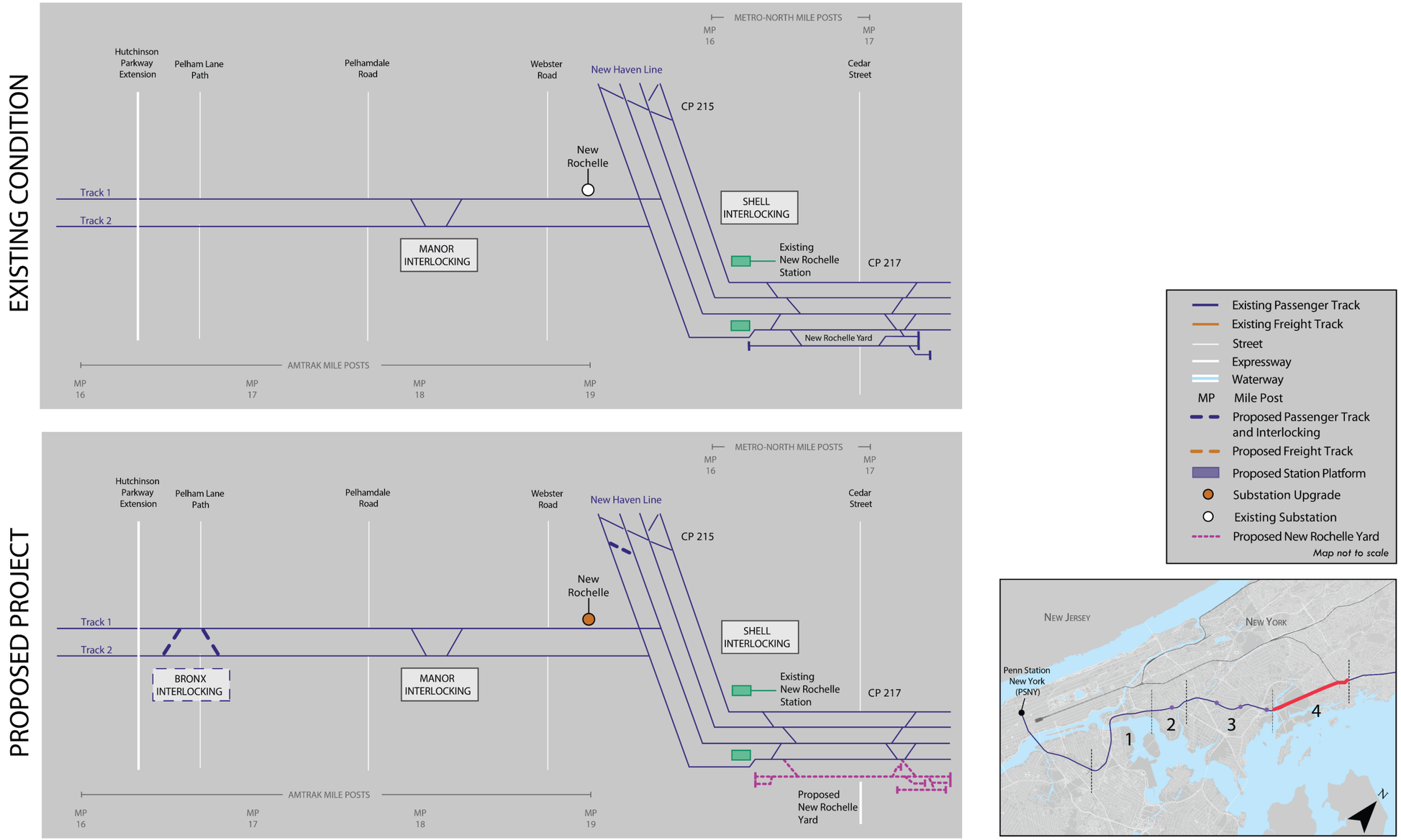
Figure 2-9 Segment 4 Schematic



Source: WSP, 2020

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2.6 OPERATIONS

The following sections describe current and future train operations within PSNY and on the HGL with the Proposed Project. For the purposes of this EA, the discussion focuses on the operations that could be directly affected by the Proposed Project along the HGL.

2.6.1 Penn Station New York Operations

NJ TRANSIT, LIRR and Amtrak operate into/out of PSNY through the East River Tunnels to Harold Interlocking. Amtrak operates its high-speed Acela service (limited stops) and Regional service from PSNY as far east as Boston, using the NEC, following the HGL to the NHL and onward. Prior studies have indicated that the East River Tunnels have enough capacity to maintain operations with the addition of proposed services. Within PSNY, LIRR trains normally operate exclusively on Tracks 17 to 21, but LIRR shares use with Amtrak and NJ TRANSIT on Tracks 13 to 16. Amtrak and NJ TRANSIT operate shared services on Tracks 5 to 12. NJ TRANSIT operates trains that turn within the station exclusively on Tracks 1 to 4. Proposed PSA (Metro-North) train service would operate on the LIRR accessible tracks, principally Tracks 17 to 21.

Metro-North and Amtrak have collaborated on a daily 102 train service plan for PSA that allows for three Metro-North trains per hour in each direction on the HGL. MTA anticipates that during the peak period, one new PSNY train per hour in each direction would be added to the NHL serving stations between Stamford, CT and New Rochelle, NY, and up to two existing trains per hour in each direction serving various NHL station zones would be diverted from GCT to PSNY. During the midday and overnight periods, the PSNY service would be one new Stamford train per hour in each direction, and one new New Rochelle train per hour in each direction. Compared to the existing service plan—which offers 120 daily revenue trains inbound to GCT (as well as 15 non-revenue trains for operational purposes)—the proposed service plan would provide 114 daily revenue and 15 non-revenue trains inbound to GCT, and 51 daily revenue trains inbound to PSNY (with the same number of daily outbound trains for a total of 102 revenue trains, as well as one non-revenue outbound train). This represents the maximum service achievable with the infrastructure to be constructed under the Proposed Project.

Table 2-2 summarizes the existing, the No Action Alternative, and Proposed Project trains operating within PSNY for the AM peak period (6 a.m. to 10 a.m.) and PM peak period (4 p.m. to 8 p.m.). Under the No Action Alternative, fewer LIRR trains will terminate at PSNY with the introduction of ESA service to GCT and the number of Amtrak trains will increase slightly due to Amtrak's new high-speed trains, which are expected to be delivered in 2021.[1] Amtrak expects to increase Acela service by one additional train per hour on the HGL.

[1] As provided by Amtrak *HST2020schedule revised Dec2018*

Table 2-2. Penn Station New York Revenue AM Peak-Period Train Arrivals and PM Peak-Period Departures

Peak-Period	Existing			No Action Alternative			Proposed Project			
	LIRR	Amtrak	Total	LIRR	Amtrak	Total	Metro-North	LIRR	Amtrak	Total
AM Peak (6 a.m. to 10 a.m.) PSNY Arrivals	99	3	**102**	87	14	**101**	12	87	14	**113**
PM Peak (4 p.m. to 8 p.m.) PSNY Departures	88	6	**94**	77	16	**93**	12	77	16	**105**

Source: LIRR, Amtrak, and Metro-North, 2020.

Reducing PSNY-bound LIRR peak service trains would provide 102 daily slots (i.e., time slots at a platform) that would be made available for Metro-North. Under the Proposed Project, 12 peak-period Metro-North trains would operate to PSNY from stations on Metro-North's NHL (as far east as New Haven), via the HGL, making stops at the four new stations in the Bronx,[2] connecting to the LIRR Main line at Harold Interlocking in Queens, and using the East River Tunnels to access tracks in PSNY. The reduction in passengers at PSNY due to ESA (roughly 40,000 AM peak-period inbound passenger-trips[3]) will provide capacity for the Proposed Project's Metro-North passengers (6,040 AM peak-period inbound passenger-trips; see Section 2.7). Metro-North passengers would utilize the station similarly to LIRR passengers. The Proposed Project would not significantly alter passenger facilities such as waiting areas, MTA ticket vending machines, and egress and ingress. In addition, under the Proposed Project, LIRR and Metro would share employee space and offices. The Penn Station New East End Gateway and LIRR Concourse project (currently under construction) will provide a new entrance and expanded concourse that will reduce crowding and benefit existing and future passengers at PSNY.

For the Proposed Project operations, Metro-North expects to operate 8-car M8 electric multiple units, which could use both 60 Hz AC OCS and DC third rail for traction power supply. Metro-North would utilize storage locations at West Side Yard in Manhattan and New Rochelle Yard for trains that are part of the new service. It is expected that under the Proposed Project, LIRR and Amtrak would implement the same train operations as the No Action Alternative.

2.6.2 Hell Gate Line Operations

Amtrak and CSX operate along the HGL, with Amtrak service traversing the corridor into/out of PSNY and CSX operating to Oak Point Yard and into Long Island via the Bay Ridge Branch. Freight operations along this portion of the HGL generally consist of three types of trains:

- **Stone Trains** – Providence and Worcester Railroad Company operates about three stone train round-trips per week, which run in the evening.
- **Garbage Trains** – CSX operates one garbage/mixed-merchandise train round-trip daily, seven days per week. and no changes in freight rail service are expected for the HGL during the peak periods in the No Action or Proposed Project:

[2] It is anticipated that not all Proposed Project trains would serve all New Haven Line stations; however, most stations would have at least one direct train every hour in the peak, with transfers between GCT trains and PSNY trains available at New Rochelle and other locations.

[3] MTA/LIRR East Side Access FEIS Table 9B-2 shows 62,249 LIRR am peak period arrivals in PSNY as compared to 103,856 in the No-Action condition

- **Other Freight Trains** –Two or three times per week, CSX uses Oak Point Yard to build local freight trains. CSX does not operate through-freight trains east of the Bronx River Bridge except for temporary storage.

Table 2-3 summarizes the existing, No Action Alternative, and Proposed Project peak-period HGL operations.

Table 2-3. AM Peak-Period Inbound and PM Peak-Period Outbound Train Operations (Hell Gate Line: Existing, No Action Alternative, Proposed Project)

Peak Period	Existing	No Action Alternative	Proposed Project		
	Amtrak	Amtrak	Metro-North	Amtrak	Total
AM Peak Period (6 a.m. to 10 a.m.) Inbound	3	5	12	5	17
PM Peak Period (4 p.m. to 8 p.m.) Outbound	6	8	12	8	20

Source: Amtrak, 2018; Metro-North, 2020

HGL operations with the Proposed Project would still include freight, as well as Metro-North and Amtrak passenger service. Table 2-3 does not reflect freight running operations, because freight operations do not use passenger tracks during passenger peak periods. Freight operations that occur outside the passenger peak-period times include assemblage of outbound trains and transfers to the Market Branch. The Proposed Project would maintain freight operations.

As noted in the discussion of the No Action Alternative (Section 2.4), the schedule for the East River Tunnels' Resiliency and Mitigation Projects, which has not yet been finalized, could affect the initiation of full service for the Proposed Project. However, for the purposes of this EA, MTA analyzed the full Proposed Project service plan to assess the full impact of those operations on the HGL Corridor study area. MTA will perform operations analyses near construction completion to optimize Metro-North's service plan and to demonstrate no impact to intercity service.

Chapter 12, "Transportation" provides further discussion of operations and analyses.

2.7 RIDERSHIP

MTA developed ridership forecasts assuming the Proposed Project's full operation for the 2025 analysis year. Although ridership throughout MTA system is down considerably as a result of the COVID-19 pandemic, MTA anticipates close to normal operations by the year 2025 and did not make adjustments to the forecast.[4] For the purposes of assessing the potential environmental impact, the analyzed ridership represents a worst-case scenario – the highest expected ridership numbers that would result in the highest levels of impacts to environmental resources.

MTA compared the Proposed Project ridership forecasts for the No Action Alternative to understand the ridership differences if the Proposed Project were implemented. (See Appendix B, "Ridership Report" for the ridership methodology and results report.) Table 2-4 shows existing, and year 2025 No Action Alternative and

[4] Analysis by MTA Planning and MTA Finance, with input from advisory organizations such as McKinsey & Company, found that forecast ridership for Bronx boardings would be 92 percent of pre-COVID forecasts and 85 percent of pre-COVID forecasts for trips originating in Connecticut and Westchester County.

Proposed Project AM peak-period inbound trips to GCT and PSNY. In 2016, 34,350 NHL passengers travelled to GCT from Connecticut and New York City stations. Under the 2025 No Action Alternative, 25,000 passengers will travel to GCT from Connecticut stations and 13,380 passengers will travel to GCT from New York City stations, for a total of 38,380 AM peak-period Metro-North NHL passengers. The Proposed Project would shift 5,010 trips from GCT to PSNY and would add 1,030 trips into PSNY in the AM peak-period. In comparison, the ESA project will shift approximately 48,000 of the 110,000 AM peak-period trips out of PSNY.[5] For the Proposed Project, Connecticut riders would account for approximately 57 percent (3,420) of the AM peak-period inbound trips to PSNY, while 43 percent (2,620) would be trips from Westchester and the Bronx. The large number of GCT diversions (which includes Harlem 125th Street Station) would result from improved access to the west side of Manhattan and the diversion of six AM peak-period inbound and five AM peak-period outbound trains from GCT to PSNY. The balance of the 12 trains running to or from PSNY in the AM peak period in each direction would be new trains between either Stamford, CT, or New Rochelle, NY, and PSNY.

Table 2-4. AM Peak-Period New Haven Line Inbound Trips to Penn Station New York and Grand Central Terminal (No Action Alternative, Proposed Project)

	No Action Alternative	Proposed Project		Change vs. No Action Alternative	
	Grand Central Terminal	Grand Central Terminal	Penn Station New York	Grand Central Terminal	Penn Station New York
Connecticut Stations	25,000	21,560	3,420	-3,440	+3,420
New York City Stations	13,380	11,830	2,620	-1,550	+2,620
TOTAL	**38,380**	**33,390**	**6,040**	**-4,990**	**+6,040**

Source: MTA, 2018; AECOM, 2020.

Table 2-5 summarizes the 2025 forecast daily ridership for the Proposed Project. Of the 30,550 daily one-way person trips, approximately 57 percent (17,530) would be trips diverted from Metro-North NHL GCT service and 43 percent (13,020) would be new trips. As shown in Table 2-6, of the 13,020 new PSA daily trips, 22 percent (2,850) would be diverted from personal vehicles and 44 percent (5,730) would be induced trips. Induced demand is the additional new ridership generated by the increased accessibility created by the four new Bronx rail stations. These are riders who would not have made the trip, or traveled using the rail mode, except for the presence of the new rail station and service. The majority (68 percent or 1,410) of these induced AM trips (2,060) would be reverse AM peak period commuters from the Bronx to Westchester and Connecticut employment centers. The 1,410 induced reverse trips account for a majority of the 2,660 outbound ons shown in Table 2-8. These predicted trips are the result of the enhanced access and significant travel time savings possible from the Bronx to these suburban locations.

Table 2-5. Daily One-Way Person Trips (Proposed Project)

Description	Proposed Project Daily One-Way Person Trips
Trips Diverted from New Haven Line Grand Central Terminal-bound Service	17,530
New Proposed Project Trips	13,020
TOTAL	**30,550**

Source: AECOM, 2020

[5] MTA LIRR ESA Final EIS 9B-6, 2001

Table 2-6. Daily One-Way New Person Trips (Proposed Project)

Description	Proposed Project Daily One-Way Person Trips
Trips diverted from other transit modes	3,700
Trips diverted from personal vehicles	2,850
Trips diverted from other Metro-North lines	740
Induced trips	5,730
TOTAL	**13,020**

Source: AECOM, 2020

Table 2-7 shows Proposed Project daily trips (ons and offs)[6] at each of the four new Bronx stations. Morris Park would have the highest daily trips with 29 percent (3,960) of the total 13,750 trips. As noted previously, 42 percent (5,730) of the 13,750 Bronx station daily trips would be induced.

Table 2-7. Daily Ons and Offs at Proposed Project Stations

Proposed Project Station	Proposed Project Daily Ons and Offs
Hunts Point	2,920
Parkchester-Van Nest	3,410
Morris Park	3,960
Co-op City	3,460
TOTAL	**13,750**

Source: AECOM, 2020

Table 2-8 shows AM peak-period trips inbound (to PSNY) and outbound (to Westchester and Connecticut) at the new Bronx stations for the Proposed Project (2025 forecast year). The improved accessibility for reverse commuting is evidenced by the 2,660 trips originating at the Bronx stations and traveling outbound to Westchester and Connecticut. Parkchester-Van Nest would have the highest AM peak-period outbound trips (840) and Co-op City would have the highest AM peak-period inbound trips to PSNY (580).

Table 2-8. AM Peak-Period Ons and Offs at Proposed Project Stations (Inbound and Outbound)

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

Source: AECOM, 2020

[6] Ons are the same as boardings and offs are the same as alightings.